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Francisco J. Martínez-López *Editor*

Handbook of Strategic e-Business Management

Forewords by Philip Kotler, Arch G. Woodside and Peter J. LaPlaca

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Handbook of Strategic e-Business Management

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Love and peace

Foreword I

E-business is an issue that companies really need to take seriously nowadays.

In the late 1990s, immediately before the Internet bubble burst, there were obviously many voices raised in support of the idea that the emerging communication technologies, the main exponent being a rather juvenile WWW, were about to change the way of doing business as we knew it.

But there were also skeptical opinions on the future impact of Internet-related technologies on business which did not foresee any major changes. Iconic companies like Amazon, Yahoo! or Google had only recently been created, almost just spun out in some cases; today's habitual mobile devices like smart phones or tablets did not exist (Apple introduced the first iPhone version in 2007), and neither did their vast number of applications covering a wide range of needs; mobile commerce was barely envisioned, and ubiquitous commerce was probably seen by many as a kind of conceptual, science-fiction tale only told in some business books on technology. And not to mention the later evolution of the Web into the so-called Social Web!

At that time Facebook, to take a prime example, was still a few years away from being dreamt up by its creators; at the time of writing this Foreword it has over 1.1 billion users—around 70 % of whom are active mobile users!—and continues to grow; it has a strong position on the NASDAQ, with a market capitalization slightly below $60 billion. Far beyond business, though, companies like Facebook or Twitter are splendid examples of how recent Internet-related innovations are helping funnel some basic human needs, especially those which are more social-related, like never before. Without them, for instance, the so-called Arab Spring movements would not have had such an impact within those countries and on the rest of the world.

So, although the bubble that had burst by 2000 could momentarily justify the skeptical view, time has proved that that was due to the over-speculation usually inherent in big things, while the phenomenon itself was rooted in real transforming technologies and ideas that have certainly materialized, since these technologies have never ceased to develop. Indeed, these technologies have fostered a giant leap forward in business since the late 1990s and, far beyond commerce, they are impacting on society and many people's lives.

There is solid ground here on which to stand and build on. E-business is a powerful reality which is both adding to and reshaping some of the structural

pillars which support the exchanges between economic agents throughout entire value networks. The guiding light for companies is still the customer along with creating and delivering genuine customer value. Many other things in business, however, have been altered by the speedy and transforming effects of communication technologies. The most important effects have to do with how business processes and exchanges are configured and how they develop. Unlike prior approaches that leaned toward designing e-business strategies to complement the company's strategies, today's approach should regard e-business-related technologies as supportive, underlying and configured to be perfectly integrated in the value creation processes.

The above ideas lead me to think that this handbook edited by my colleague Francisco J. (Paco) Martínez-López deals with a very timely topic. During the last two decades, e-business has been intensively analyzed from the perspective of diverse business areas which has produced a rich knowledge framework. However, a book of these characteristics was still necessary. It analyzes diverse primary and concrete, strategic and operational management and business-related topics within this era of ever-expanding and pervasive e-business. The contents are presented in a suitable and complete structure, as you would expect from a research handbook. The contributions are numerous and usually theoretical, an approach that is appreciated in handbooks, and are aimed at analyzing, discussing and building on research topics. And the managerial implications of these contributions for practitioners are given extensive coverage. The contributions span the continents and the research expertise in each article is evident. It is worth mentioning the significant participation of outstanding business scholars. I am confident that this handbook will be useful for academics and professionals interested in e-business.

To sum up, the foundations, state of the art and current theoretical discussions complemented by practical implications as well as future insights on e-business all come together in this handbook. I foresee that it will probably be considered a milestone in e-business research with the passage of time. I am happy to open the book with these words, and congratulate the editor and contributors, and wish them all a warm welcome from business researchers, practitioners, and interested readers in general.

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Foreword II

Desmet & Parente's (2008) insights and findings about the start and rapid growth of the Industrial Revolution (1760–1840) are remarkably apt in analyzing the dramatic transformations of what we might refer to as the current "Second E-Business Revolution (SEBR, 1970–2050). Desmet & Parente (2008, p. 1) provide evidence supporting their main theoretical tenet, "The key to the start of the Industrial Revolution was the expansion and integration of markets that preceded it. Due to less regulation, increasing population, and declining trade costs, markets in England came to support an increasing variety of goods. As such, the demand became more elastic and competition intensified. This increased the benefits to process innovation. Sometime in the eighteenth century, these benefits became sufficiently large for firms to cover the fixed costs of innovation, giving rise to the Industrial Revolution."

Several similarities are noteworthy in comparing these two revolutions. The similarities provide insights and a useful frame for reading this "Handbook of Strategic e-Business Management". The first point: both revolutions began with a whisper and not a bang. Krugman (1999, p. 22–23) points out that the modern information age began when Intel introduced the microprocessor—the guts of a computer on a single chip—back in 1971. "By the early 1980s products that put this technology to high visible use—fax machines, video games, and personal computers—were becoming widespread. But at the time it didn't feel like a revolution. Most people assumed that the information industries would continue to be dominated by big, bureaucratic companies like IBM—or that all the new technologies would eventually go the way of the fax machine, the VCR, and the video game: invented by innovative Americans but converted into a paying product only be faceless Japanese manufacturers."

The second point: incompetent sense-making of reality and exuberance became widespread following widespread reports of business start-ups and growing applications of microprocessors—the Dot-com Bubble Era (1997–2000). This short-lived era lead to spectacular business failures and investment losses.

The Post Dot-com Bubble Era (2000–2010) was a decade-long period of transition from thinking and focusing on single business models to the use of a dominant and subordinate business models with conflicting perspectives among executives trying to execute such business model marriages.

Resolutions of the channel conflicts are ending the conflict in the current decade with the introduction of workable and profitable multi-channel business models.

According to Commerce Department estimates (www.electran.org), US e-commerce sales totalled $194.3 billion in 2011, up 16.1% from $167.3 billion in 2010. By 2015, online sales are expected to reach around $270 billion, an increase of $100 billion compared to 2010 (www.emarketer.com). The rapid development of commerce on the Internet has made it attractive form any manufacturers who traditionally distribute their products through retailers, to engage in direct on line sales. (Pei & Yan, 2003, p. 218)

The Sustainable Era of E-business Growth (SEEG) is now underway (2010–2030). The SEEG Era includes the continuing introduction of "game-changing" business models but these introductions are relying on highly-reliable-organization (HRO, see Weick and Sutcliffe 2007) operating platforms, and a much lower presence of unbridled exuberance. The promises delivered by this handbook are useful new insights and advances in knowledge of go-to tools by examining logical "and" statements that associate firm and customer relevant new technologies, sustainable sales growth via business model innovations, *and* increasing profits are.

The best way to read this handbook is to focus first on reading the chapters that answer your burning questions— Francisco J. Martínez-López, the handbook editor, does not ask Authors to read chapters in one particular order. For the executive implementing new e-market business-models, read the abstracts to locate your top-five chapters relating to the issue of leveraging business growth and profits by applying proven fast and effective new electronic technologies. After reading this group of chapters focus on your additional burning issues. Upon reading three chapters you are likely to conclude that the book's title fits the contents—this book is truly a handbook for nurturing highly successful e-business models as well as for understanding deeply our current SEEG Era.

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Foreword III

The 1960s heralded in the "Information Age." Computers were starting to assist managers with analyzing vast (i.e., megabytes) amounts of data. Managers replaced their "gut feelings" with solid information. Companies started to build automated databases to hold both operational and customer data. The slowest part of the process was the collection and inputting of data. As more and more managers appreciated the usefulness of more and more data, information technology departments grew in both size and importance to the organization. More information was always better…right? Errors and bad decisions were still made…and they cost more.

As computers became more powerful and could crunch even more data, the acquisition of the data became even more critical to the success of these decision support systems. And the explosion of the Internet in the 1980s (before the internet bust) increased the pressure on the wizards of analysis. As the rate of data collection grew geometrically, new tools were developed but managerial utilization lagged the capabilities of the new tools. Organizational power associated with vast (i.e., gigabytes) amounts of data continued to rest in information technology departments. The Internet burst not only impacted dotcom investors, but it also took the wind out of the sails of IT departments.

The rebirth of the Internet as a tool of commerce (rather than a path to instant riches) again made data acquisition easier and more accurate as e-commerce system automatically collected virtually every mouse click made by every customer creating vast (i.e., terabytes) amounts of data. Companies no longer had to guess or pay handsomely to determine how customers got to their doorstep (in this case web site); the system collected it all. Still the capabilities of management to grasp all that an e-commerce presence offered lagged behind the potential.

In the "Handbook of Strategic e-Business Management", Francisco J. Martínez-López has collected the thoughts of an outstanding set of e-commerce experts. This excellent handbook begins, as all things should begin, with a solid foundation of the strategic impact of e-commerce and how it affects the relationships between buyers and sellers. The Internet has greatly broadened markets served by business; however, at the same time, it has greatly increased customer knowledge of market offering, prices, customer experiences, and other information for customer decision making.

The second section of this handbook is a treatise on how value creation and competitive advantage have been impacted by e-commerce. The Internet has created a new mode of buyer–seller interaction leading to a totally new business model, a model that must be mastered for continued success. Businesses have become instantly more flexible, but without proper management, this new flexibility can tie the firm into knots.

One of the most dynamic changed capabilities of e-commerce is the integration of multiple members of supply chains. Because of the data capturing ability of e-commerce, all members of the supply chain can be instantly informed of the flow of commerce; but they must create the capability of acting on this flow of instantaneous, real-time information. The third section of this handbook looks at changes necessary in operations, marketing, human resources, and information management itself to fully succeed in the new world of global e-commerce.

In the fourth and final section of this handbook, Martínez-López has put together ten extremely insightful essays on where the world of e-commerce is headed. More importantly the authors also discuss how businesses can get ahead of these trends and truly be successful.

The "Handbook of Strategic e-Business Management" is a must read by any business manager to understand the new rules of e-business, to learn how to adapt their businesses to survive and be successful in the new millennium, and how to make decisions with vast (i.e., petabytes) information becomes the new norm.

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Preface

This research handbook project has been really challenging, and much more complex and time-consuming than I expected. It has taken about two-and-a-half years of intensive work since it got started. My main purpose has been to provide a comprehensive and integrative reference, of course never finished and always open to future updates, on strategic management for organizations within the e-business context. The handbook format was chosen because of the interest in developing an extensive and complete approach to the core topic, at least in reference to covering the great issues of strategic management in the e-business framework, rather than editing a research book with a competitive call for chapters and the eventual omission of big themes. The themes of the contributions have been selected on the basis of contributors' research domains and expertise in the topics of interest. I feel privileged to have attracted the attention of so many great scholars, some of them really prestigious and world-renowned academics whose research has been a key source of business knowledge and inspiration to me, and many others, in recent years. Working with them has been an enriching experience that has helped me grow as a researcher and person. I would like to highlight their diligent and intense dedication to improving their draft chapters, attending to suggestions from me and the referees' throughout the constructive review processes, which in some cases consisted of three or four review rounds. I owe them all, reviewers and especially the authors, whose ideas are the true asset and soul of this handbook, an enormous debt of gratitude. I hope that their efforts are compensated with satisfactory acceptance and wide diffusion of their articles. I am confident that their texts will inspire and be useful for researchers and professionals interested in these topics.

This handbook is structured in four parts. The Part I, "Background", provides an overall analysis of e-business. The initial chapter (Zwass) presents an original, integrated and comprehensive framework for e-business, named the 5Cs framework, which is broken down into superstructure (commerce, collaboration and communication) and supporting domains (connection and computation). Then, an extensive and in-depth diagnostic of the macro- and micro-economic (based on Michael Porter's Five Forces) implications of e-business for organizations is presented (Prieger and Heil).

Next, Part II, an "Evolved Strategic Framework for the Management of Companies", approaches important strategic e-business issues: the need to take the e-business strategic process as a dynamic interaction-based process (Ivang); the

categorization of Internet business models based on how value is created and captured (Sandulli, Rodríguez-Duarte and Sánchez-Fernández); the relationship between Information Technology (IT) assets and capabilities, the firm's performance and competitive advantage (Pérez-Aróstegui and Martínez-López); the implications of companies' learning structures and their strategic flexibility, with a distinction between e-business start-ups and e-business adapters (Verdú, Alós-Simó and Gómez-Gras); the first-mover advantage in electronic markets (Varadarajan, Yadav and Shankar); and, finally, the strategies that online retailers can develop to avoid perfect competition equilibrium, or the Law of One Price (Sandulli and López-Sánchez).

Part III, "Key Business Processes, Areas and Activities", is structured across several key company areas and are organized as categories or subparts to form the chapters here. The following topics related to "Production/Operations" are analysed: the use of information systems to improve the process of product innovation (Burtch, Di Benedetto and Mudambi); the enhancing role of e-business in the Supply Chain Management integration process (Minguela, Arias and Opazo); how to use IT and e-business applications to create business value in the supply chain (Wiengarten, Humphreys and Fynes); the discussion and proposal of a contingency framework for the design of e-supply chains, as well as a framework for e-supply chain evaluation (Mukhtar); and an analysis of the evolving relationships between Enterprise Resource Planning (ERP) and e-business within an e-SCM framework (Srinivasan and Asoke).

As for "Marketing", which accounts for a large number of contributions in this part, the following themes are included: the implications of e-business for strategic marketing theory and practice (Rudd, Shepherd and Lee); an extensive model of online consumer behavior is presented in detail (Richard and Laroche); a holistic theoretical delimitation of online consumption motivations (Martínez-López, Pla, Gázquez-Abad and Rodríguez-Ardura); a state-of-the-art discussion of the "flow" concept in online consumer behavior (Esteban-Millat, Martínez-López, Luna and Rodríguez-Ardura); a literature review on the use, characteristics and impact of e-commerce recommendation systems (Xiao and Benbasat); an extensive approach to the past, present and future of e-tailing (Williams); the key aspects of managing multiple marketing channels and the role of e-commerce (Brown and Dant); an in-depth review of firms' pricing strategies on the Internet (Chen); an integrated review of online advertising effectiveness (Rejón and Martínez-López); and online advertising clutter and consumer's avoidance behaviors (Rejón and Martínez-López).

The area of "Human Resources" is covered by contributions that deal with some very interesting topics. It starts with an analysis of the role and implications of electronic Human Resources Management (e-HRM) for firms' efficiency, effectiveness and strategic outcomes (Parry). There then follows a critical literature review on the main e-HRM approaches (Strohmeier), and finally a detailed discussion of the challenges for e-HRM research and practice (Rüel and Bondarouk).

The fourth area is "Information Systems and Knowledge Management", which includes, the following topics: the alignment of knowledge management and business strategies in organizations (Swain and Booto Ekionea); the factors

explaining the adoption of information systems outsourcing (ISO) by firms (Martins and Oliveira); the analysis and recommendation of key design factors to create and maintain adequate websites for organizations (Al-Hassan and Sibley); and enhancing the relationship between knowledge management and strategic e-business by creating and using objective measurements that compare different types of knowledge repositories (Schwartz).

The final part of the handbook focuses on "Emerging Issues, Trends and Opportunities", and is broken down into two parts. Due to the singular, current and ever-growing importance of the Social Web, the first subpart is dedicated to the following Social Web-related issues: the evolution of digital business models and categorization within a Web 2.0 context (Wirtz, Mory and Piehler); a service-dominant logic for Customer Relationship Management (CRM) through the Social Web, known as Social CRM (Chen and Vargo); innovation through collaborative information platforms or e-nnovation (Pattinson); a conceptual analysis of electronic Word-of-Mouth (e-WOM); and the role of online communities in supporting international business decisions (Sinkovics, Penz and Molina-Castillo). The second subpart brings together several chapters that treat other interesting emerging issues and trends: ethics in e-business (Palmer and Stoll); factors influencing the online image of companies (Walczak, Gregg, Borkan and Erskine); an integrative framework of complaint communication management on the Internet (Breitsohl, Khammash and Griffiths); evaluation of quality in mobile services, with a theoretical framework proposal and empirical analysis (Stiakakis and Petridis); and review of corporate disclosure strategies, and potentially misleading practices, on companies' websites (Guillamón-Saorín and Martínez-López).

With the main contents of the handbook synthetically introduced, I would like to acknowledge the support of Christian Rauscher, my editor at Springer, for this handbook. He is a really great professional and person, continuously encouraging me and backing me at all times. I have many good memories of our intense correspondence throughout the editing process, from various places around the world and at different times and seasons (even on holidays!). Also, I would like to thank my research team, in particular my dear colleagues Juan Carlos Gázquez-Abad (University of Almería, Spain) and Irene Esteban-Millat (Open University of Catalonia, Spain), for helping me to carry on with other research projects and duties while editing this book.

This handbook has mainly been edited in Granada (Spain), where my home university is, and New York City (USA). I thank my colleagues in the Department of Business Administration at the University of Granada for always making it easy for me to take a leave of absence for long periods as visiting scholar at Baruch College (CUNY). This would not have been possible either without the help and kind support of my colleague David Luna, Professor of Marketing at Baruch College, and also contributor to this handbook; I sincerely appreciate his assistance and thank him for that. It is also fair and necessary to acknowledge the financial support received from diverse institutions and administrations: the "José Castillejo" program for international research stays (Ministry of Education, Spain); Research Project ECO2012-31712, as part of the Non-Oriented Fundamental

Research Projects subprogram (Ministry of Economy and Competitiveness, Spain); the University of Granada (Spain); and the Ramón Areces Foundation (Spain).

Last but not least, I feel extremely grateful and immensely honored to have counted on the collaboration of the eminent scholars who have contributed to this handbook's Foreword. I cannot imagine a better way to open this handbook than with their thoughts and blessings.

Finally, I humbly hope that this handbook inspires and provides useful support for the ongoing development of the e-business strategic management framework and, above all, helps to formulate better e-business strategies and processes that, ultimately, improve people's lives.

New York City, June 2013 Francisco J. Martínez-López

Contents

Part I
Background

The Framework and the Big Ideas of e-Business

Vladimir Zwass

Abstract In order to gain an integrated view of e-business (considered synonymous with e-commerce) and the opportunities it offers in the development of organizational strategies, a comprehensive framework of the activities in the field is presented. The 5Cs framework consists of 5 domains. The top three of them, the superstructure, represent the economic and social activities of commerce, collaboration, and communication. The two supporting domains are those of the technological infrastructure: connection and computation. Analyzing the activities within these domains, we identify the ten big ideas that have influenced the development of e-business in a decisive way and that exert continuing influence on the way information systems are used strategically. The identified activities and ideas will serve to innovate in the future development of e-business as a growing component of economic and societal development.

Keywords E-business · E-commerce · 5Cs framework · Strategic options · E-commerce big ideas · Innovation

1 Introduction

E-business (EB), or e-commerce, is the sharing of business information, maintaining of business relationships, and conducting of business transactions by means of digital telecommunications networks (Zwass 1996). Based on the Internet-Web compound,[1] EB has experienced dramatic growth in all three areas its application:

[1] We shall further refer to this compound as the Web, unless the Internet is being referred to specifically.

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Table 1 E-business aspects of internet-web compound to be deployed in strategy development (adapted and revised from: Zwass 2003)

Activity domain	E-business aspect
Commerce	Marketplace
	Universal supply-chain linkage
Collaboration	Network of relationships
	Collaboratory
Communication	Interactive medium
	Forum
	Connectivity in context
	Distribution channel
Connection	Development platform
	Universal telecommunications network
Computation	Computing utility

business-to-business (which accounts for the lion's share of EB), business-to-consumer, and intraorganizational uses. Over approximately two recent decades, EB has entered a trajectory that has been changing societal functioning, operation of the markets, production and consumption, and the very fabric of our lives. The methods of calculating the volume of this activity vary widely. On the average among the G-20 countries, the "Internet economy" is estimated to have accounted for 4.1 % of the GDP of in 2010, expected to grow to 5.3 % by 2016, according to the Boston Consulting Group ("It Keeps…" 2012). EB is thus a phenomenon of strategic—and growing—importance at all levels of analysis. The objective here is to present an encompassing analytical framework of the activities in the domain and then distill the essential ideas that have emerged in these activities to influence the present and the expected future development of the field.

2 The 5Cs Framework of E-Business

The Web has given rise to a wide range of interrelated entrepreneurial and intrapreneurial activities that can be conceptualized within the 5Cs framework shown in Table 1. Business models, organizational strategies and the tactics necessary to implement them, can be generated by analyzing these opportunities within the compass and context of an existing or prospective firm. I shall proceed to discuss them here.

2.1 Commerce

The topmost activity domain, that of Commerce, encompasses the spectrum of customer–supplier arrangements at the opposite ends of which are the markets and the long-lasting electronic hierarchies of long-term supply webs (Williamson 1975; Malone et al. 1987). The "move to the middle" hypothesis argues for the tendency toward the investment in relatively stable relationships with a limited number of well-chosen suppliers (Clemons et al. 1993).

In the electronic *marketplaces* takes place the matching of buyers and sellers, establishing the transaction terms, and the facilitation of exchange transactions (Bakos 1998). The entrepreneurial activity on the Web, with the relatively low—and falling—barriers to entry and with a relatively easy access to capital in a number of countries, has populated the e-marketplaces ("marketspaces") with numerous firms, frequently competing by strategically varying business models. EB marketplaces are characterized by the ability to bring together rapidly and efficiently high numbers of buyers and sellers, while at the same time facilitating the matching with vast amounts of information. The marketplaces can be created with desired matching rules, including price discovery under various auction regimes.

There are multiple means to create a closer match between the buyer's preferences and the value received by the buyer on the one hand, and the seller's offering on the other. This occurs owing to the availability of the longitudinal profiling information about the individual buyers as well as their current context (e.g., the locational information in m-commerce). This match can be furthered by recommender systems that base their recommendations on the specified or inferred from various contextual data preferences of the buyer. Further, mass customization enables the sellers to deploy their access to a "mass" of buyers to provide quasi-customized products at quasi-mass-production prices. Prices can be dynamic in multiple respects, matching the supply and demand via yield management for perishable commodities (in the airline ticketing and to a lesser extent in hotel rooms, for example), congestion pricing, and a variety of methods of price discrimination that attempt to reduce the consumer surplus by selling to the inferred consumer value. The massive mining of the longitudinal structured and unstructured data that can be contextualized in multiple ways underlies the effectiveness of this flexible pricing.

With the broad move to the Web-enabled enterprise systems with relatively uniform capabilities as compared to the legacy systems, a *universal supply-chain linkage* has been created. This facilitates a variety of sourcing arrangements that can lead to long-term strategic alliances between and among firms. Corporate strategies can thus focus on the firm's core competences, however these are interpreted under the prevailing circumstances. Process specialists, offering what is seen as the best-of-breed processes, e.g., in manufacturing or human resources, are configured by the hub firms into the supply webs. The relatively universal linkage offers also the opportunity for a strategic reconfiguration of supply webs as

necessary. The ability for the producer and the consumer to come together directly over the Web had precipitated the hope or fear of massive disintermediation. What has actually taken place in various markets is the reconfiguration of the physical intermediation (by, say, travel agents) into digital intermediation often by more numerous intermediaries than before (by, say, flight aggregators and travel sites), while employing significantly fewer people.

The ability of the sellers in the e-marketplaces to effect a close and differentiated match with buyers' preferences has prevailed over the expected trend toward price homogenization and profitless commerce. Contrary to many expectations, the price and total cost dispersion in online markets have been found to persist and even surpass these in the physical markets (Stylianou et al. 2005). Long-term reputations are a powerful means of differentiation and branding. Indeed, among the explanations for persisting price dispersion are service differentiation by the sellers as well as brand power (Ba et al. 2012). Consumer demand has been found more price-elastic in the relatively well-established and well-patronized air-travel online channel by Granados et al. (2012), which perhaps lets us expect that in the fullness of time the long-predicted price convergences will be seen.

2.2 Collaboration

The Web is a vast nexus, or *network, of relationships* among firms and individuals. Indeed, in my definition of EB (or e-commerce), the relationships precede transactions in most meaningful respects. Business ecosystems are formed to deliver complex support to the customers, as in the ecosystem surrounding, for instance, eBay. These ecosystems can address complex and multifaceted needs of a customer or a group of customers in a lifecycle event or be brought to bear on a new and innovative business model.

Social network sites, where many relationships are enacted, have attracted many business models aiming to exploit the traces of these relationships. Known as social commerce, these models center on marketing through the electronic word-of-mouth (eWOM) and through inferred influences of "friends" (Liang and Turban 2011–2012). The articulations expressed in these networks can be aggregated and mined towards a support of various business models, although the ownership and the permissions to use of these articulations are at present in flux and largely subject to the regulation by norm and software code. The participants of the social networks thus become involved, wittingly or not, in a network of collaboration with the offer of a great variety of goods and services. EWOM has been found to significantly influence sales (Chevalier and Mayzlin 2006; Zhu and Zhang 2010) and to assist in hyperdifferentiation with niche products, leading to higher profitability (Clemons et al. 2006). Consumers are found likely to contribute to online reviews for niche products, which can lead to the success of the products reviewed favorably (Dellarocas et al. 2010).

Open innovation enabled by the Web aims to involve customers and suppliers, along with other stakeholders, in generating, evaluating, and realizing new ideas that would lead to new products and new ways of addressing marketplaces (Chesbrough 2006). The relationships established and enacted through social networks, corporate portals, and extranets lead to a virtual expansion of organizational knowledge and can markedly reduce time-to-market for new products. In particular, co-creation of value by consumers supports a variety of strategic initiatives. Unaffiliated individuals create open-source software, produce knowledge compendia, and publish on the Web their product reviews. Sponsored co-creation occurs at the behest of producers; in autonomous co-creation, individuals act independently of any producers in their creation of value (Zwass 2010). Both types of co-creation rely on the capabilities of the Web for the crucial aggregation and for massive access.

More or less formal *collaboratories* are created or emerge on the Web to bring together individuals engaged in knowledge work in a manner that limits the constraints of space, time, national boundaries, and organizational affiliation. Wikis are a convenient collaboration tool (Wagner and Majchrzak 2006–2007); a wiki with the associated software underlies, for example, the emergent organizational forms in the production of Wikipedia (Arazy et al. 2011). A variety of motivators are operative in the absence of an organizational affiliation, for example, in various open source software projects (Roberts et al. 2006; Zwass 2010). The speed with which such collaboratories can be created and their unlimited reach, along with the potential access to the deep stores of data and software tools makes them a potent force in innovation. Business networks, whose collaboration is enabled by Web-integrated information technology, have become source of value creation (Kauffman et al. 2010).

2.3 Communication

The Web is an unprecedented means of human communication, from one-to-one, to narrowcasting from one to many, small-to-large group interaction, and on to mass broadcasting at a virtual zero cost. The almost universal global access to this medium gives it the power that challenges the traditional media. Here, anyone can be the producer of content, which assigns value to the skillful aggregation, or curation. Many feel that here also anyone has the unchallenged right to be the consumer of content, applicable laws notwithstanding.

As an *interactive medium*, the Web has given rise to a multiplicity of media products. Owing to the perceived cultural norms and a low marginal cost of production, as well as the accessible means of value arrogation, many of these products are free or provided under *freemium* arrangements, where only the premium versions extract a payment. Of particular weight are the social media, most powerfully organized on the social network sites, with Facebook being indeed the best-known face of these. As the participants form, evolve, and often strengthen their relationships, the articulations, bonds, “likes,” following, photos, and other

traces of preferences and relationships accumulate and are subject to aggregation and commercial exploitation by the platform providers. Privacy concerns abound and the norms and laws are *in statu nascendi*.

This universal medium has become a *forum* for self-expression (as in blogs) and self-presentation (as, for an example, in Polyvore). This forum is frequently an electronic community which individuals join, whose concerns and interests they share, to which they sometimes contribute, and which may serve as a source of identity. These communities are a potent source of co-created value, whose distribution is often questionable (Zwass 2010).

As a medium, the Web has become a marketing tool of vast importance. Advertising underwrites or contributes to many business models; public relations via the Web, while by their very nature less apparent, are of great import as well ("buzz" or eWOM can be skillfully manipulated). The vast digital traces being left on the Web serve in personalized advertising; the interactive nature of the medium enables the immediacy of the purchase transaction by an ad clickthrough. The strategic importance of the Web as a medium is buttressed by the location-dependent opportunities in m-commerce, the ability of instant contextualization of a potential online customer based on the data troves, combined with the power of recommendation systems.

The rapidly growing m-commerce enables *connectivity in context*, with location-sensitive products and advertising. Combined with the augmented general mapping capabilities as well as the personalized social mapping, this gives rise to a variety of business models, many as yet unexplored, to satisfy the needs of the potential customer in real time. There is a trade-off: the closer this mode of commerce is to come to the customer's need satisfaction, the greater the disclosure, indeed customer intimacy, required. Remote monitoring, tracking, diagnosis, and operation capabilities serve the needs of healthcare, equipment maintenance, and autonomous equipment activities in the environment.

In the Communications domain, the Web also serves as a *distribution channel* for digital products. This is clearly so in the case of the content in various formats, with the vast opportunities of bundling or unbundling, and of a highly granular management of digital rights. This domain of activity challenges the found structures of supply chains and networks, offering strategic opportunities for the emergence of new digital intermediaries as more or less specialized aggregators. A variety of formerly physical goods and services are being delivered digitally, including tokens (such as tickets) or computation (in cloud computing).

2.4 Connection and Computation

The two infrastructural domains at the base of the 5Cs framework support the superstructure by offering the commonalities of universal connectivity and the sharing of computing resources. Common software *development platforms*, many of them in the open-source domain, enable a wide spectrum of firms to avail themselves of the benefits of the already developed software which is, moreover,

compatible with that of their trading and collaborating partners. The availability for reuse and the interoperability of software help in a fast ramp-up of new ventures. At the same time, this wide availability calls for seeking competitive advantage in the novel business models, deploying information systems in new ways, rather than by systems development itself. The technological opportunity for intra- and interorganizational system integration affords the firms the capability of designing Web-deploying system architectures dynamic enough to pivot the business models in pursuing new competitive opportunities. The Internet, as a network of networks that is easy to join and out of which it is relatively easy to carve out virtual private networks, is the *universal telecommunications network*, now widely expanding in the mobile domain. Various digital divides do persist, both in the certain regions of the world and in the urban cores of developed countries where broadband access is limited. At the same time, the "base-of-the-pyramid" initiatives in the connectivity of smartphones and e-payments have opened even the most impoverished areas of the globe to numerous new opportunities in business and lifestyle.

Internet infrastructure enables large-scale sharing of computational and storage resources, leading to the implementation of the decades-old idea of utility computing. Among the opportunities here is grid computing, that is, bringing mass-scale computation via sharing of temporarily unused capacity to solve massive computational problems. Cloud computing has become the most prominent deployment of pay-as-you-go *computing utility*. By providing powerful software products, software development platforms, or infrastructure, as a service, numerous companies address the needs of their clients for the dynamic business models and a cost-effective meeting of the needs of their own customers.

3 Ten Big Ideas in e-Business

EB has been created by and continues to be a cauldron of innovative ideas that emerge, and are then combined, evolved, and recontextualized, to fade out or to blossom into powerful business models and strategies. The following ten ideas have gained what appears to be a lasting and powerful value over the two decades of the Web-driven EB and may be expected exert lasting influence on the EB strategies in the future. It is notable that these ideas emerge from a creative combination of strategic innovation opportunities in the activity domains of the 5Cs framework. They are presented in the top-down order of that framework.

3.1 Digital Market-Making

The ability to bring successfully to a large and open market ever new goods and services expands the economy. Ever new business models are exploiting mass and ubiquitous access by buyers and, in some cases, sellers, to bring to market just

about anything legal in such mass marketplaces as eBay (via an auction or fixed-price model) or craigslist (with a fixed price, negotiation, or giveaway). The newer market-making models enable economically-efficient sharing of ever new resources: a car, a lodging, a driveway, or a textbook. This ability of growing digital markets is related to the expansion of trust in EB, cross-fertilization of ideas derived from preceding marketizations, the move into mass m-commerce with widely accessible mobile devices, lowering of the costs with the precipitous fall of hardware prices and access to the open-source software, and the general acculturation to e-commerce. Goods known as experience goods, such as art, find increasingly markets ready for it on the Web (e.g., in Art.sy).

3.2 Recommenders

Recommendation systems help in close matching to the expected value a customer will derive from the product, which increases market efficiency in all senses of the word. Collaborative filtering techniques help to infer the individual's desires from those of others classified to belong to the same cohort, with the classification improving by continuing learning from new interactions (Cacheda et al. 2011). Collaborative filtering can be combined with social filtering to determine the potential influences of the social circle and communities on the prospective customer's needs and desires. There has emerged a variety of recommenders of different properties (Xiao and Banbasat 2007). As decision aids, recommenders help users cope with information overload (Aljukhadar et al. 2012–2013).

3.3 Mass Customization

By combining the ability to gauge closely the individual needs and to meet them with a seemingly personalized product, EB models can deliver higher value to the customers and extract a higher portion of consumer surplus. The key capability is the aggregation of demand from a segment with closely matching needs in order to organize batched collection of customer requirements, the production of quasi-customized products, and their delivery. This capability demassifies the market at prices not far removed from mass production. The new additive manufacturing techniques, with distributed 3D printing, are expected to expand this market approach and significantly affect the design of supply webs.

3.4 Business Models as Competitive Weapon

Business models have existed since the first goods exchange took place in prehistory. The ability to rapidly innovate, roll out, and pivot business models in the search of competitive advantage is the characteristic of EB. Thus, in all their great

variety, the models have become a potent competitive tool. Often an apparently slight modification in addressing the marketplace with a mass-customized product accessible to the properly selected customers accessed via appropriate keywords in AdWords search, as opposed to the previously unworkable model leads to strategic success—and to the future further modifications of the model.

3.5 Monetized Search

Keyword search with algorithmically well-ranked responses, monetized through advertisements (as in Google's AdWords), has brought uncounted business opportunities, and not only to its creator company and its followers. It enables a close match of an offering with a customer who appears to be seeking it at the time of this search. The match is made closer by the longitudinal data collected about the apparent seeker and the ad's sponsor. Similarly a social graph search, currently being rolled out by Facebook, is based on the known relationships among the potential customers' and ad recipients, on the assumption of their being influenced by their virtual "friends" (Rusli and Efrati 2013). Both of the competing paradigms aim to narrow the gap between the inferred desires and the marketplace offerings—and both make it economically feasible to offer major Web platforms.

3.6 Social Networks and Virtual Communities

Social network sites, emblematized by Facebook and LinkedIn, enable the emergence and maintenance of interpersonal relationships on an unprecedented scale. Virtual communities, created on these or other sites, are a potent phenomenon in civil societies, in the economies, in reputation making—and in leaving the digital traces to marketers (Rheingold 1993). Virtual communities range from the rather weakly binding brand communities (Muniz and O'Guinn 2001) to strongly binding—and highly productive of data—communities of affliction, such as PatientsLikeMe. The power of the consumer (and of an individual in general) is exerted and leveraged through these networks and communities. Virtual communities are the primary locus of value co-creation by consumers and the interactions with community members supply a large number of motivators for co-creation.

3.7 Co-creation

With the Web, consumers have gained the widely accessible means of production, distribution of digital products and articulations, the means of effort coordination, which is at the same time the means of product aggregation (Benkler 2006; Zwass

2010). Therefore, products and articulations such as software, knowledge compendia, blogs, reviews, communications, or photos can be created within the consumer sphere. Thus, individuals and communities have become a growing productive force. There are multiple business models built around co-creation, with the value accruing to the community, to the aggregator (e.g., Huffington Post or Facebook), or to the site that sponsors a variety of innovation or feedback activities by individuals. Co-creation is a form of democratizing innovation (von Hippel 2005).

3.8 Context-Specific Commerce

With the advent of m-commerce, it has become possible to address the needs of the customers based on their current location, which can in turn be placed in the context of the geographic surroundings with respect to business opportunities, other individuals of potential interest currently present, past interactions in the locale, and the knowledge of the potential customer's profile. With the progressing advent of massive sensor networks embedded in the environment and the future emergence of the Internet of Things, an entirely new spectrum of strategic business opportunities will emerge, depending on the weather, presence, state or absence of various objects, and various activities in the environment, among others.

3.9 Information System as Business Core

Companies such as eBay, Facebook, or Google represent a new type of business organization, whose core is a vast information system. Such a system consists of server and storage farms, distributed around the world and networked over the Internet, as well as a vast agglomeration of specialized software, running the auctions and payments, social networks, and search engines with the ad-serving auctions, respectively, along with ancillary functionalities. With such a core, it becomes possible (if not always desirable) to modify and tune business models almost constantly, and thus engage in strategic opportunism in the competitive marketplace.

3.10 Cloud Computing

Cloud computing enables ubiquitous access to shared computing resources. The ability to move the desired components of information systems into the cloud, and thus share the computational facilities within the firm (as in the internal clouds) or outsource them, lends flexibility to corporate strategies. Companies can be started

and expand without significant computational and the associated human resources. Security concerns are being allayed, with even personal health records being moved into the clouds (Hobson 2013). All start-ups and existing firms should consider how their fluctuating demands can be satisfied by the pay-for-use schemes of on-demand utility computing.

4 Conclusion

The 5Cs framework makes it possible to generate, analyze, and evolve strategic options in EB by pursuing activities within five domains: commerce, collaboration, communication, connection, and computation. The EB aspects within these domains carry their own business opportunities and imperatives. If a business model aims to exploit the Web as a communications medium, for example, it cannot expect to garner profits in the same way and, perhaps, to the same extent as a model that aims to create a marketplace for a new product extended by a package of services. At the same time, strategic options may be generated by skillfully blending several well-understood aspects of EB.

Numerous new ideas have emerged and been tested in the great global laboratory of the Web. Ten of them have been identified here as the "big ideas," whose potency underwrites the highly successful business models of today and may be expected to do so in the future. The exploitation of these ideas is still largely in its infancy. The possibilities of m-commerce are only beginning to be tested. The vastly expanded addressing space of IPv6 will enable the Internet of Things, with myriad objects gaining Internet connectivity—and enabling new business models, testing new ideas. The continuing exploration will undoubtedly result in the new big ideas, no less powerful or promising than the ones that offer strategic options today.

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Economic Implications of e-Business for Organizations

James E. Prieger and Daniel Heil

Abstract We review the macroeconomic and microeconomic impacts of e-business on organizations. E-business improves the economic efficiency of national economies through greater capital formation and long-run efficiency gains. E-business affects many aspects of the economy, from international trade to monetary and fiscal policies. At the microeconomic level, we use Porter's Five Forces to organize our discussion of how e-business changes the creation of value and its division among market players. ICT affects industry through many channels and at many levels, from how inputs are purchased to how final goods and services are sold and delivered. The corporate strategist must consider how e-business may change the nature of rivalry among the competitors. Changes in upstream and downstream interactions in the market and expanded opportunities for substitutes and potential entrants also influence strategy. Thus, e-business can alter strategy by changing the nature of entry threats, suppliers' power, buyers' power, threats from substitutes, and rivalry among existing firms. We discuss empirical results from the literature wherever possible to illustrate the importance of e-business for a firm's strategy. We close with a brief look at e-business and non-profit organizations.

Keywords Microeconomics · Macroeconomics · Productivity · Five Forces · B2B e-commerce · B2C e-commerce · Competition · Rivalry · Buyer and seller power · Nonprofits

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1 Introduction

The Internet and other uses of information and communications technology (ICT) in business—e-business[1]—have transformed the milieu in which many firms and other organizations strive to maximize profit or attain their other goals. In the area of business-to-consumer (B2C) e-commerce alone, retail transactions over the Internet have grown to $186B per annum in the US in 2011, accounting for 4.5 % of all retail activity (US Census Bureau 2011b). US business-to-business (B2B) e-commerce is much larger than B2C e-commerce. From the macroeconomic level (e.g., the impact of e-business on national productivity and taxation) to the microeconomic level (e.g., the electronic transmission of B2B purchase orders), e-business greatly affects the competitive forces that shape markets and thus influences both the strategy of organizations attempting to survive and prosper and their resulting profitability. In this article, we explain the economics of e-business, looking in turn at the macroeconomic and microeconomic aspects. The twin goals of the article are to explain the macroeconomic impacts of the adoption of ICT by business and to demonstrate how much e-business matters to organizations and their strategies by discussing ICT's impact on the creation of value and its division among market players. To accomplish the second goal, we discuss empirical results from the literature wherever possible to illustrate the importance of e-business for a firm's strategy. The chapter provides an understanding of how e-business impacts the various parts of the economy, how it affects the profitability of markets, and what are the implications for the strategic thinking of organizations. We begin in the next section with the macroeconomic impacts of e-business. In Sects. 3 and 4, we turn to the microeconomic view, first considering the strategic implications of e-business for profit motivated firms, and then looking at what may differ for nonprofit organizations.

2 Macroeconomic Impacts

E-commerce generally benefits consumers through greater competition, lower prices, and more choices.[2] Investments in ICT provide opportunities for businesses to improve efficiency and reach more customers. While lower costs and improved productivity need not improve an industry's profits, overall lower costs for firms and lower prices and expanded choices for consumers result in increased economic welfare from the rapid expansion of e-commerce. The net effect of e-commerce on national economies is unambiguously positive. Nevertheless, the rapid

[1] We use the term e-business to refer to any use of ICT by organizations. We reserve the term e-commerce to refer specifically to ICT use in commercial transactions among organizations and consumers.

[2] We note some exceptions in Sect. 3.

development of e-commerce across the world creates unprecedented policy challenges for governments. The introduction of e-money and e-payments may one day pose a threat to a central bank's ability to implement effective monetary policy. Furthermore, e-commerce creates borderless markets that reduce government revenue from sales and use taxes. The way policymakers respond to these potential issues will influence business strategies and consumer decisions.

In this section, we explore some of the impacts e-business has on national economies. We examine how ICT affects economic efficiency, reserving a more focused look at how e-business affects profitability until Sect. 3. We begin with a review of the growth of e-commerce. We then explore the empirical literature regarding the effect e-business has on national productivity and economic output rates through greater capital formation and long-run efficiency gains.[3] We highlight the impact e-commerce has on international trade as one particularly significant example of how e-commerce enhances economic efficiency. We follow this discussion with a review of the significant issues e-commerce creates for monetary and fiscal policies. See Prieger and Heil (2010a) for a more complete discussion of macroeconomic issues.

2.1 The Size of E-Commerce

Although e-commerce entered popular discussion with the expansion of the Internet in the 1990s, ICT use by business predates the Internet by decades. Firms began to adopt electronic data interchange (EDI) systems in the 1960s. These systems offered dramatic efficiency gains for B2B commerce by connecting firms' purchasing and inventory systems, reducing input and inventory costs, and increasing labor productivity (Banerjee and Golhar 1994). Standardization of EDI technology in the 1970s and 1980s led to the popularity of non-Internet B2B e-commerce systems among large US businesses by the early 1990s, although only a minority of smaller businesses had made investments in the technology (Graham et al. 1995; Banerjee and Golhar 1994). Adoption of e-commerce in B2C has been even slower. Despite the dot.com boom and the expansion of B2C e-commerce in the latter part of the 1990s, the majority of e-commerce transactions in the US were among businesses (Brookes and Wahhaj 2001). B2B transactions continue to be the dominant form of e-commerce across the world. In 2009, B2B e-commerce sales were $3.1 trillion or 32 % of all B2B transactions in the US (US Census 2011a). Meanwhile, B2C e-commerce in the US accounted for $298 billion or only 2.8 % of all B2C purchases in 2009. Retail sales account for about half of the B2C figure, with the rest coming from services.

[3] We mainly focus on the US and European economies, but include estimates for developing nations when available.

Global B2C e-commerce spending was estimated to be $708 billion in 2010 (IDC 2011). Since 2001 the growth in e-commerce among developed nations has been dramatic. The US witnessed a four-fold increase in e-commerce sales. E-commerce markets in Australia and South Korea both increased more than seven-fold (OECD 2011). Developing nations as a whole lag behind the developed world in terms of e-commerce, but there is considerable variation in e-commerce diffusion within the developing world (UNCTAD 2011a).

2.2 Productivity and Economic Growth

E-business increases business productivity by reducing transaction and search costs, lowering expenses related to transportation and maintaining inventories, and expanding access to additional input and retail markets (Basu and Siems 2004). In the aggregate, these productivity gains result in higher labor productivity and higher economic growth. In this section, we review the related empirical evidence.

Total economic output, typically measured in terms of Gross Domestic Product (GDP), is a function of a country's inputs—most commonly labor and capital—and the effectiveness of a nation's production process. Investment in ICT affects total economic output through two mechanisms. First, ICT investment increases the capital stock of a nation. As the ratio of capital to worker increases, labor productivity rises. In the short-run, this increased productivity results in increased economic growth. In the long-run, capital deepening increases the level of productivity, but does not affect productivity growth rates (Willis 2004). Second, in the long-run, ICT investment boosts economic efficiency by transforming the production function itself (Brynjolfsson and Hitt 2002). Greater use of ICT encourages more R&D which can lead to greater innovation rates. In addition, e-business allows for increased specialization for firms and nations. For instance, as we discuss in the subsection following, e-business improves economic efficiency through expanding international trade. Overall, these long term effects enhance a nation's total factor productivity (TFP).[4]

There is a broad consensus regarding the theoretical benefits of e-business. Prior to the mid-1990s, however, e-business had no discernible effect on productivity statistics. This "productivity paradox" was due in part to measurement error of inputs and outputs (Brynjolfsson 1993). For example, price indices failed to account adequately for new products and improvements in product quality due to ICT, leading to an overstatement of inflation and consequently an understatement of real increases in economic output (Cummins and Violante 2002).[5]

[4] In growth accounting, TFP is a measurement of changes in output that are not directly attributed to changes in the supply of labor, capital, or other factors of production (Jorgenson et al. 2006).

[5] The US consumer price index (CPI) overstated inflation by as much as 1.1 % annually during the 1990s (Boskin et al. 1996), and (despite improved methodology) probably still overstates

Brynjolfsson (1993) suggests the productivity paradox was also a consequence of significant lag time. Maximizing the returns from ICT requires significant time to restructure production process and familiarize workers with the new technologies (Venturini 2009). In the interim, the productivity gains from ICT investment may only be a fraction of their eventual impact.

Despite the many limitations in accurately measuring the aggregate benefits from ICT, recent efforts consistently find positive effects to national economies from e-business. Empirical evidence reveals short run increases in productivity growth from capital deepening. The surge in ICT investment in the 1990s was an important factor in rising labor productivity and output growth rates in the second half of the decade. Oliner and Sichel (2000) attribute 37 % of growth in labor productivity from 1996 to 1999 to increases in the ICT capital stock. Likewise, Jorgenson et al. (2006) estimate that ICT capital investments accounted for nearly 30 % of growth in US labor productivity from 1995 to 2004. When the growth rate of labor productivity increases, so does the growth rate of output. Greater capital formation accounted for nearly 40 % of the increase in output rates for the US between 1996 and 1996 with ICT investment responsible for 60 % of the growth (Oliner and Sichel 2000). Economic growth in some developing countries also benefited from ICT related capital investment. From 1995 to 2003, an estimated 10 % of China's economic growth and 25 % of Brazil's economic growth was a consequence of ICT capital deepening by business (Jorgenson and Vu 2005).

Over the long term, ICT investment produces efficiency gains by enhancing the production function itself, as measured by TFP. Generally, researchers find a strong positive relationship between ICT investment and increases in economic efficiency in developed nations (Lee et al. 2005). In the US, TFP rose dramatically in the late 1990s. The estimated contribution to TFP from ICT capital formation varies, but researchers agree that the investments played an integral role in productivity growth in the last two decades. Oliner and Sichel (2000) estimate ICT-related efficiency gains in the late 1990s were responsible for two-thirds of the 1.16 annual percentage point growth in TFP. International comparisons further highlight the role e-business played in US productivity growth in the last two decades. In the 1990s, TFP growth in the US was particularly large relative to Europe, and Timmer and van Ark (2005) attribute the divide primarily to differences in ICT investment. After adjusting price indices for changes in quality, Sakellaris and Vijselaar (2005) contend that divergent TFP rates in Europe and the US largely explain why US output growth led that of the EU.

While there is significant variation between countries, all parts of the developed world have enjoyed efficiency advances from ICT. The contributions to GDP growth from ICT investment ranges among OECD countries from 0.6 percentage points per year for Denmark to 0.2 % points for Germany (OECD 2011). Many

(Footnote 5 continued)
inflation by as much as 0.8 % points per year (Gordon 2006). Likewise, European price indices largely neglected quality improvements (Timmer and van Ark 2005).

developing nations, however, have yet to see significant improvements in efficiency from ICT investment (Lee et al. 2005). Developing countries often lack needed digital infrastructure, well-functioning capital markets, and appropriately trained workforces (UNCTAD 2007).

2.3 International Trade

The potential improvement in efficiency that ICT offers is demonstrated in the realm of international trade. E-business reduces transactions costs between businesses, which encourages greater economies of specialization by firms and nations (Wen 2004). Improvements in ICT reduce the cost of communicating and exchanging information, which allows businesses to form relationships with foreign companies and countries (UNCTAD 2007). The opportunities for increased specialization ultimately lead to higher productivity and greater global economic output. In addition, e-commerce expands markets beyond borders which lowers price and increases consumer choice (Terzi 2011).

There is a relative dearth of data on the global size of international trade via e-commerce. Recent estimates, however, suggest considerable growth in international trade of ICT goods and services. In the last decade, international trade for ICT services increased four-fold, but still accounts for only 2.5 % of total service trade (UNCTAD 2011a). In 2009, 12 % of exported goods in the world were ICT related (UNCTAD 2011b). India witnessed particularly large increases in ICT service exports, while China was the chief exporter of ICT goods (UNCTAD 2011a). Overall, however, global benefits from e-commerce through international trade remain largely unrealized. Many countries have yet to adopt trade liberalization policies and many developing nations lack the digital infrastructure necessary to participate fully in ICT trade (Terzi 2011). Nevertheless, evidence indicates that Internet access stimulates exports from developing countries (Clarke 2008).

2.4 Monetary Policy

Monetary policy, typically administered by central banks, is chiefly concerned with maintaining low and stable inflation. E-commerce can reduce prices by expanding markets and increasing competition. These price reductions may have a significant effect on the aggregate price level, reducing inflation in the short run. The dynamic nature of e-business also allows businesses to adjust quickly to inflation by reducing price-adjustment costs. Finally, new payment mechanisms within e-commerce potentially limit the incentive and ability of central banks to inflate currencies. We discuss each of these potential monetary impacts of e-commerce below.

2.4.1 e-Business, Prices, and Menu Costs

The potential cost savings to business from greater investment and implementation of ICT are considerable (Prieger and Heil 2010a). B2B e-commerce reduces purchasing costs, allows firms to streamline inventory systems, increases information regarding suppliers, and increases competition among suppliers which lowers the cost of inputs (Brookes and Wahhaj 2001). A 2002 survey forecasted over $500 billion in cost savings from full implementation of Internet-related e-business solutions in the US and cost savings of €88 billion in the UK, France, and Germany (Varian et al. 2002). During the 1990s, however, researchers disagreed over whether e-commerce would lower consumer prices or firms would capture the cost savings and earn higher profits.

What then is the net impact of e-commerce on prices of consumer goods? Clearly prices for some goods readily amenable to e-commerce have fallen greatly. Brynjolfsson and Smith (2000) find that prices for books and CDs purchased online average 9–16 % lower than prices at traditional stores, even accounting for shipping charges. Similarly, Bakos et al. (2005) find that financial trades performed online are cheaper (albeit of lower quality; i.e., they result in worse transaction prices) than those executed by traditional brokers. Brown and Goolsbee (2002) find that e-commerce lowers term life insurance prices by both online and traditional retailers. However, other empirical studies provide a picture that is decidedly more mixed. Some early studies found that prices were higher online (Lee (1998) and Lee et al. (1999) for cars; Bailey (1998) for books and CDs) or about the same online and offline (Friberg et al. (2000) and Clay et al. (2001) for books). Furthermore, various studies have documented that online prices still can display a high degree of price dispersion, in markets as varied as books, CDs, airfares, and others (Brynjolfsson and Smith 2000; Clemons et al. 2002; Scholten and Smith 2002; Walter et al. 2006; Chellappa et al. 2010; Bachis and Piga 2011).[6] Recent evidence indicates that price dispersion may decrease as online markets mature (Bock et al. 2007).

Estimates vary concerning e-business' effect on the overall price level. Brookes and Wahhaj (2001) estimate that B2B e-business may reduce aggregate prices by 4.4 % in Germany, 3.5 % in Japan, and 3.4 % in the US. In the short run, these reductions lower inflation rates. Along with improvements in monetary policy and globalization, Basu and Siems (2004) attribute historically low inflation rates in the 1990s to cost savings from e-business. Ultimately, unless e-business continues to produce new cost savings, the one-time change in the price level will have no effect on long-run inflation (Willis 2004).

E-business not only reduces inflation in the short run, but may also alleviate some of the costs inflation imposes on firms. Online pricing reduces the costs associated with physically changing prices, which economists call "menu costs." With lower menu costs, firms can change their prices more often, lessening the

[6] See also the survey on online price dispersion research by Baye et al. (2007).

impact of economic shocks. Brynjolfsson and Smith (2000) show that online book and CD retailers make many more small price changes than do offline retailers. This has significant implications for various macroeconomic theories, especially neo-Keynesian models that assume significant price rigidities (Kauffmann and Lee 2010). Even absent physical menu costs, however, online prices can remain less than fully flexible due to managerial costs related to pricing decisions and contracts with predetermined nominal prices (Chakrabarti and Scholnick 2007; Kauffmann and Lee 2010). There is considerable international variation, with online retailers in Europe adjusting prices more often than US firms (Lunnemann and Wintr 2011).

2.4.2 e-Commerce and the Money Supply

E-commerce also creates challenges for monetary authorities through the introduction of cashless payment mechanisms, commonly referred to as e-payments and e-money.[7] E-payments like credit and debit cards are now the predominant source of payments for online purchases and mobile payments are gaining popularity (Hartmann 2006). Reduced demand for cash potentially affects monetary policy by limiting the effectiveness of the tools commonly used by central banks and reducing the revenue central banks collect from banknotes (seigniorage) (Hartmann 2006).[8] The latter effect may one day jeopardize the autonomy of central banks if they must seek government financing, which may have detrimental consequences, for lack of central bank independence is correlated with increased inflation (Alesina and Summers 1993). However, e-money to date constitutes only a negligible fraction of the settlement media market (CPSS 2008).[9]

E-payments cost considerably less than traditional payment mechanisms: one-third to half the typical cost (Humphrey et al. 2001). These cost savings represent additional savings from e-commerce for businesses and consumers, and could be especially large in developing countries where cash is currently the primary payment mechanism (BIS 1996).

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[7] Originally, the definition of e-money only included payment methods that stored monetary value on a device in the possession of the consumer. New types of e-money have instead largely been server-based, where funds are stored on the issuer's servers or a distributed network and consumers access their funds remotely (Hartmann 2006).

[8] Refer to ECB (1998) and Prieger and Heil (2010a) for more complete discussions.

[9] One reason for the slow acceptance of e-money are its strong network effects: demand is contingent on merchants' willingness to exchange goods and services for the e-money, but merchants have little incentive to accept new sources of money that are not popular among consumers (Hartmann 2006).

2.5 Fiscal Policy and Taxation

By pulling down geographic barriers to market transactions, e-commerce increases interstate trade in the US. While this produces significant benefits for consumers, it also may decrease state and local government revenue from consumption taxes. E-commerce threatens tax revenue in US states that rely heavily on revenue from sales and use taxes. The European Union (EU) faces similar challenges in levying value added taxes (VATs) on international e-commerce purchases (Ivinson 2003). In addition to the issue of tax revenue, many brick-and-mortar retailers voice equity concerns regarding the favorable tax treatment offered to online retailers.

In the US, firms that maintain a physical presence in a state are responsible for collecting applicable sales taxes, but out-of-state merchants are not. State residents are legally responsible to pay use taxes on any purchases where applicable sales taxes are not collected, but few residents pay use taxes except for goods registered with the state (e.g., automobiles) or on purchases by businesses (McLure 2002). However, Bruce et al. (2009) estimate that taxes are uncollected on only about four percent of total taxable and untaxable e-commerce. States are nevertheless seeking to expand what counts legally as a physical presence within their borders. Most recently, California and New York enacted "affiliate taxes" that sought to tax online retailers who pay commission to state residents who direct traffic to the retailers, even though the retailers have no direct physical presence within the state.[10]

The recent affiliate taxes are part of a larger movement by state governments to raise revenue through taxing e-commerce. The potential revenue from taxing e-commerce, however, may prove minimal in the short run. Only 13 % of B2B e-commerce transactions, the dominant form of e-commerce in the US, are taxable under current law (Bruce et al. 2009). Goolsbee (2009) argues that many online purchases are for items typically excluded from sales tax collection (e.g., leisure travel and event tickets). Further, many e-commerce transactions are already taxed because they occur between sellers and buyers from the same state. In fact, three-fourths of sales and use taxes due from e-commerce purchases were collected in 2007 (Bruce et al. 2009). Goolsbee (2009) estimates that e-commerce reduced sales tax revenue by $612 million in 1999. Following the considerable growth in e-commerce, the revenue loss to state and local governments increased to $7.3 billion in 2007 (Bruce et al. 2009). Using optimistic forecasts for future e-commerce development, Bruce et al. (2009) predict the revenue loss could be as much as $12.7 billion in 2012, a trivial fraction of the $1.4 trillion total size of state

[10] Online retailer Amazon.com responded to the California law by ending its relationship with its California affiliates. California lawmakers have subsequently repealed the law in exchange for Amazon's cooperation with future efforts to streamline the nation's sales tax system.

government in the US. Across the US, the 2007 loss in revenue amounts to only 2.43 % of total sales and use tax with considerable variation among states.[11]

While brick-and-mortar retailers and revenue-deprived US state governments increasingly demand greater taxation on e-commerce transactions, there are some reasons to maintain the preferred tax treatment of online retailers. Goolsbee (2009) argues that the positive network externalities from early adopters of ICT might justify an implicit subsidy for e-commerce merchants, at least in the short term. Furthermore, the difficulty for out-of-state vendors in managing so many unique tax policies would ultimately reduce competition, and benefit traditional retailers at the expense of consumers and the overall economy.

Relative to the US, the EU has been far more aggressive in protecting tax revenue from the threat of e-commerce. Prior to 2003, countries within the EU levied a VAT on e-commerce transactions based on the residence of the vendor. This design overtaxed domestic E-commerce products relative to imports in Europe and put European e-commerce exports at a disadvantage in international markets (McLure 2003). In 2003, the EU adopted rules where the collection of a VAT for digital goods and services depends on the buyer's residency (Ivenson 2003). Ivenson (2003) contends that the EU's aggressive taxation of e-commerce may enhance revenue, but it may also limit the expansion of ICT use in the EU and therefore postpone future welfare gains from the widespread diffusion of e-commerce.

3 Microeconomic Impacts for Business

Any general purpose technology such as ICT will affect industry through many channels and at many levels, from how inputs are purchased to how final goods and services are sold and delivered. Understanding the implications of e-business for an organization's bottom line requires thinking about much more than potential cost savings from adopting various forms ICT. After all, the firm's competitors are adopting ICT as well, and Carr (2003) notes that ICT can raise productivity for all but grant competitive advantage to none. The question for a firm is whether adopters, such as participants in an electronic industry exchange, can appropriate the benefits as profit (Mitra and Singhal 2008). The corporate strategist must therefore consider how e-business may change the nature of rivalry among the competitors, and must be careful to also consider changes in interactions upstream and downstream in the market and with substitutes and potential entrants.

Porter (2008) identifies five key drivers of profitability that underlie any industry, labeling them the Five Forces. The Five Forces of entry threats,

[11] Unsurprisingly, Bruce et al. (2009) find that states with larger than average percentage losses include states like California and New York who have been particularly aggressive in redefining what counts as a "physical presence" within a state.

suppliers' power, buyers' power, threats from substitutes, and rivalry among existing firms all look different in the New Economy. While some authors criticize Porter's (2001) Five Forces analysis of e-business on various grounds, including a perceived overemphasis on corporations (Clemons 2008) and an undue influence of the dot.com boom on his discussion (Karagiannopoulos et al. 2005), such criticism does not strike at the inherent usefulness of the framework. In this section, we use the Five Forces as a convenient way to organize our discussion of the implications of e-business on strategy.[12]

Some industries, such as ICT services, tourism, banking and other financial services, and publishing have been completely transformed by e-business, while many firms (small and medium enterprises [SMEs], in particular) in other industries such as chemical and paper manufacturing and construction have moved little beyond basic use of ICT (EC DGEI 2010). We review in this section some of the literature illuminating how e-business alters the underlying factors that affect the Five Forces. While empirical studies of specific industries are reviewed to illustrate larger themes, the discussion is meant to be general. Other authors look specifically at the ramifications of e-business on the Five Forces in particular industries and organizations: Yeo and Huang (2003) on mobile e-commerce, Siaw and Yu (2004) on banking, Buhalis and Zoge (2007) on tourism, and Lee et al. (2001) on public schools, to name a few.

3.1 Threat of Entry

The first of the Five Forces is the threat of new competitors entering the market. Porter (2008) points to several factors that affect the threat of entry, including economies of scale on the supply side, network effects (which can be seen as economies of scale on the demand side), customer switching costs, capital requirements (particularly large sunk costs), unequal access to distribution channels, and other advantages of incumbency, not to mention government policy that explicitly or implicitly raises entry barriers. We discuss how e-business affects these factors, although discussion of switching costs is postponed until Sects. 3.2.3 and 3.4.2.[13]

[12] It is important to note that the strategic approach taken here differs from a normative economic approach. While the Five Forces are organized to help a corporate strategist assess competition and profitability from the industry participant's point of view, a typical normative economic approach instead emphasizes social efficiency and welfare. See Prieger and Heil (2010a, b) for the economic view of the impact of e-business.

[13] We also set aside another factor affecting the threat of entry, government policy that raises entry barriers, because policy regarding e-business is an extensive field of academic study that is largely separate from the strategy literature. See Kraemer et al. (2006) for an overview of policy toward e-business across countries.

Early thinking on how the Internet changes competition in the New Economy focused on the potential for a flood of entry into markets, upsetting the traditional balances among incumbents (Porter 2001). The Internet was seen as lowering or even demolishing barriers to entry such as the need to procure prime physical business locations for retail stores or build a sales force. Furthermore, by de-emphasizing the physical location of sellers (but not making location irrelevant—see Blum and Goldfarb (2006)), e-commerce brings firms from outside traditional geographic market boundaries into competition with local incumbents for sales. Retail segments such as sales of books and rentals of movies have been especially vulnerable to entry from e-commerce competitors. On the other hand, other commentators argue instead that the cost structure of digital information goods, in which nearly all cost is fixed and the marginal cost is essentially zero, creates new entry barriers (Karagiannopoulos et al. 2005). While there are elements of truth in each position, the way that e-business affects the threat of entry is more nuanced than either extreme suggests, requiring examination of the particular market at issue. We examine potential influences of e-business on the major determinants of the strength of the threat of entry.

3.1.1 Economies of Scale and Scope

Economies of scale can become either a greater or a lesser factor in an industry due to e-business. Old economy industries exhibiting significant economies of scale, such as steelmaking and automobile production, might see mild increases in the degree of economies of scale manufacturers enjoy. In such industries, the capital requirements leading to large fixed, sunk costs stem from the physical nature of the production process, and the Internet does not change the necessity or economy of building huge plants to make steelmaking or automobiles. However, implementation of ICT in procurement, supply chain management, and on the factory floor can lower the marginal cost of production. For example, Phillips and Meeker (2000) estimate that processing a purchase order manually costs 8–18 times what online procurement costs. With unchanged fixed costs but lower variable costs, the minimum efficient scale in the industry moves to a larger level of output.

In other industries, e-commerce may nullify traditional advantages conferred by economies of scale. Siaw and Yu (2004) use the banking sector as an example, pointing out that in the era of Internet banking, the physical size of a bank is less relevant to customers. Banks with a large number of physical locations no longer reap the same benefits from ubiquity, and Siaw and Yu (2004) go so far as to claim that economies of scale no longer matter.

Economies of scope, which imply that costs are lower for a single firm to jointly produce a set of goods than for multiple firms to separately produce each good, can also raise entry barriers, because an entrant must enter markets for multiple goods to be as efficient as an incumbent. Bakos and Brynjolfsson (2007) model a type of economies of scope in markets for information goods that they term "economies of aggregation." When the cost of producing information goods is all fixed cost, with

no marginal cost, then there are significant profit advantages to being a large bundler of goods. Since it is easier for a seller to predict consumers' valuations of collections of goods than to predict valuations of single goods (due to the statistical law of large numbers), the aggregator can capture more of the value created by each information good when it is part of a bundle. Their model shows that stand-alone entry with a single substitute good for a product that is part of an incumbent's bundle of goods difficult, even if the potential entrant has a cost advantage. A better entry strategy requires entering with a complete bundle of goods, which raises the barriers to successful entry.

3.1.2 Network Effects

Demand-side economies of scale can arise from network effects. Network effects may be direct, as in telephone networks where an additional subscriber to the network raises the value of the network for other subscribers, or indirect, as in the home video game market where the provision of video games (complementary goods) raises the value of the gaming console (the platform). Clearly, the Internet is rife with network effects (Economides 2007), and at first consideration it may appear that the network effects must raise entry barriers in e-commerce markets. For example, a potential entrant in the market for paid advertising of housing rentals or posting of employment opportunities must overcome the large advantage conferred by network effects to incumbents such as Craigslist. The familiar chicken-and-egg problem that afflicts such platforms can deter entry: if no one is posting job openings on the site, people looking for work will not search there, and without a thick market of potential employees, employers see low value in posting on the site. While this phenomenon is not unique to e-business markets, such examples have greatly proliferated in the Internet age.

In other markets, however, moving a network onto the Internet may lower entry barriers into the network. Consider exchanges such as B2C sites like Amazon.com. For a given retailer wishing to sell on the Internet, it may be difficult to start a rival platform to compete in e-commerce. However, given the two-sided nature of a B2C platform, the incumbent platform may find it profitable to invite other e-tailers to enter the platform, in order to stimulate consumer demand for the platform (Economides 1996). Thus, Amazon now offers goods for sale from itself and competitors on the same site. Sometimes the platform operator benefits so much from the indirect network effects created by the provision of complementary goods that it will subsidize their creation. For example, in the home video game market, console makers such as Sony (PlayStation) and Microsoft (Xbox) subsidize creation of games by providing development tools for their platform, even though such games compete with games developed by the console makers (Rochet and Tirole 2003). Such inducements to enter the market are effectively "negative entry barriers."

The prevalence of platform markets enabled by ICT and the Internet raises the question of whether incumbent platform owners can raise "application barriers to

entry" by locking in the supply of large numbers of complementary goods. Successful lock-in burdens competing platforms and potential challengers with producing the complementary goods themselves or finding alternative suppliers, which may raise rivals' costs and can diminish competition. Empirical work in this area of research is scarce, but indicates that such vertical restraints need not in fact lead to insurmountable challenges to entry (Prieger and Hu 2010).

3.1.3 Capital Requirements and Sunk Costs

A major aspect of the e-business revolution is the outsourcing of ICT. As cloud computing and other forms of ICT outsourcing gain momentum, the cost structure of adopting firms changes. Investment in the purchase of computer equipment for processing or web hosting and other expenditure leading to large fixed (or highly indivisible) costs that become mostly sunk after purchase is replaced with ICT outsourcing, thus converting sunk costs into variable costs. As the need to amass large amounts of capital to enter an industry diminishes, along with the importance of sunk costs, entry barriers fall. Etro (2009) estimates that cloud computing alone will spur the entry of a few hundred thousand new SMEs in Europe over a five year horizon.

3.1.4 Unequal Access to Distribution Channels

By replacing the physical commercial district, where prime real estate is scarce, with the unlimited size of cyberspace, e-commerce lowers an entry barrier that is important in industries such as retailing and banking. Large banks invested huge sums in the 1980s and early 1990s through merger and growth from within to increase their number of physical locations to offer service to customers. The advent of online banking removes much of the erstwhile advantage of dominant customer access channels, for customers can perform many banking tasks from their computer that formerly required a visit to a branch (Siaw and Yu 2004). Other industries lacking cost-effective ways to deliver the good (e.g., gasoline) or service (e.g., hair styling) to customers' homes will see the importance of their traditional customer access channels survive intact (Eppright and Hawkins 2009).

ICT need not grant small entrants the same opportunities their larger rivals enjoy in the area of B2B e-commerce, either. By providing a new way to gain competitive advantages over smaller firms, e-business may tilt the market more in the direction of larger firms. Forman (2005), in a study of the Internet adoption decisions of more than 6,000 firms, finds that larger organizations were more likely to adopt Internet access and application technologies in the earlier years of the Internet age.[14] At first glance this finding is puzzling: should not the considerations

[14] See also the many other studies cited in Sect. 3.3 of Forman and Goldfarb (2006).

mentioned above make Internet adoption even more attractive for small firms? Study of particular e-commerce institutions sheds some light on the reasons. For example, e-business systems such as B2B vertical hubs[15] may create or perpetuate entry barriers in an industry (Ravichandran et al. 2007). This is despite the fact that smaller firms would seem to benefit more from industry exchanges because such organizations, in contrast to large firms, lack the resources to create and implement their own integration mechanisms. However, the large incumbents in industries protected by high entry barriers are likely to own and control the vertical hubs, fashioning the supply and distribution channels to sustain their dominance. Empirical work supports these ideas (Mitra and Singhal 2008; Ravichandran et al. 2007). Mitra and Singhal (2008) find empirical evidence from an event study of 63 B2B vertical hubs that larger firms have greater expected profitability from joining or forming an industry exchange, which the authors argue is evidence that ICT does not necessarily "level the playing field" for smaller firms.

3.1.5 Other Advantages of Incumbency

Incumbents may enjoy other advantages independent of size that entrants would find hard to duplicate. As an example of a traditional barrier to entry that e-commerce demolishes in some industries, Porter (2001) offers the Internet's obviation of experienced, well trained sales forces. The empirical support for Porter's conjecture is mixed. Eppright and Hawkins (2009) examine 23 product categories and fail to find significant correlation between the value of the sales force and online market share (i.e., the fraction of all industry revenue that is earned through online sales) or online market growth in an industry. However, their study shows that having little value in the industry to demonstrating the product (which is closely related to the value of having a sales force) does predict higher online market growth.

Another advantage incumbents traditionally possessed in some industries was access to a quality supply of skilled labor. Even though labor is highly mobile in the US, some industries tend to agglomerate in particular areas due to the large local pools of qualified workers (take, for example, the fact that Silicon Valley is as much the name of an industry as it is a geographic descriptor). Van Winden et al. (2012) refer to such areas as "knowledge locations." Entry of a new firm may become more costly in such cases, because of the high price of real estate in the preferred industry location. Conversely, establishing a company outside the preferred locus may raise the cost of obtaining high quality labor. E-business can lower the advantage incumbents may have regarding location-specific labor

[15] Mitra and Singhal (2008) define B2B hubs as "virtual marketplaces that enable any-to-any transactions between buyers and sellers, aggregate demand and supply, and enable price determination through a variety of mechanisms such as catalogs, real-time negotiation, auctions, and reverse auctions. These hubs [provide an infrastructure for commerce by] matching buyers and sellers, facilitating product comparisons".

market channels, because firms' adoption of ICT lowers the coordination costs to employing geographically dispersed employees. In one empirical study, Forman (2005) found that "[g]eographic dispersion of employees is complementary with Internet access adoption, suggesting that Internet technology lowered internal coordination costs" by allowing businesses to relocate their employees to remote locations (or hire them there). The dispersion and mobility of labor is a vital part of the New Economy business model (Lazonick 2007).

Finally, it is important to note that the impact of e-business on entry barriers evolves over time. In a study of the entry and exit of 460 e-tailers during 1994 and 2003, Nikolaeva (2007) found that while early entry into e-commerce conferred an advantage to business (indicating an advantage of incumbency), the survival advantage dissipated after about two years. Her results also showed that the survival times of e-commerce retailers who entered during the mature phase of the industry improved significantly, which indicates that entry barriers were decreasing over time.

3.2 Power of Suppliers

When the power of suppliers to industry is great, the supply group will be able to garner a greater fraction of the value the industry creates. The suppliers can capture value by raising prices on inputs needed by the industry or by forcing the industry to take on costs otherwise borne by the supply group (Porter 2008). Supplier power depends on the concentration of the supplier group, how heavily the suppliers depends on the industry in question for profit, the industry's switching costs when changing suppliers, the supplier group's ability to integrate downstream into the industry if industry profits are too high, the degree of product differentiation in the suppliers' products, and the availability of substitutes for the suppliers' products.

It is clear that the impact of e-business on these factors is mixed, and will differ among industries. Industry buyers have lower search costs for finding substitutes, which will tend to intensify price competition between suppliers and increase industry power. However, buyers may also find themselves locked into B2B vertical hubs in their supply chain and face higher switching costs, which will have the opposite effect. We discuss some of the varied impacts the Internet has on the factors influencing the power of suppliers in this section. Since we discuss the impact of e-commerce on product differentiation and the availability of substitutes later in this chapter, we do not cover those here.

3.2.1 Concentration of the Supplier Group

In general, the more concentrated the supply group, the higher the margins its members will be able to charge to industry for inputs. E-commerce may diminish

concentration or amplify its power over industry, depending on the market. B2B vertical hubs have the ability to increase the number of sellers and bring them into more direct competition with each other, so that the industry's input goods and services sell for lower prices and have higher quality (Ravichanran et al. 2007; Kaplan and Sawhney 2000). Factors bringing about the increased competition include not only the increase in the number of sellers in one forum but also the greater transparency of product prices and cost structures (Sinha 2000).[16]

When the hub is controlled by the sellers, they can leverage the power of their concentration by choosing the pricing mechanisms and setting the terms for transactions (Ravichanran et al. 2007).[17] Although it is natural enough to expect that seller concentration would go hand in hand with seller control of the B2B hub, empirical evidence is mixed. Ravichanran et al. (2007) find no empirical support for the hypothesis that hubs in concentrated industries lead to markets tilted toward sellers, after controlling for entry barriers. However, Mitra and Singhal's (2008) event study shows that the stock market reaction to announcements by firms to form or join B2B vertical hubs is positive, and greatest for larger firms. Thus it appears that the market expects that larger sellers will be able to extract more profit from industry with the hub.

3.2.2 Dependence of the Supplier Group on the Industry

When markets are not perfectly competitive, prices between sellers and buyers are often determined by bargaining. In such cases, the bargaining position of the buying industry will be enhanced if the supplier group depends heavily on the industry for its profit. While e-business allows tighter control and coordination of the supply chain, often lowering transaction costs,[18] vertical supply chain integration (VSCI) also tightens the bonds between supplier and buyer. Susarla et al. (2011) point out that successful VSCI requires that production planning and tactical decision-making must be conducted together with supply chain partners. However, the well known "hold up" or "lock in" problem from the theory of vertical relations posits that once relationship-specific costs have been sunk by one party, the other party may opportunistically seek to renegotiate terms in its favor.[19] In the present context, thus, if the seller makes irreversible investment in the supply chain relationship

[16] However, sellers may obfuscate their offerings precisely to avoid such transparency, as we explain below in Sect. 3.4.2.

[17] As examples of hubs in which sellers hold the upper hand, Ravichanran et al. (2007) point to "forward aggregation sites typically associated with either supplier aligned or neutral hubs with the primary role of enabling suppliers to reach a larger set of buyers." See those authors for specific examples of such B2B hubs.

[18] For a contrary view, see Cordella (2006), who argues that in some situations ICT increases transaction costs due to information overload and other market, organizational, or managerial imperfections.

[19] See Sect. 4.2 of Katz (1989).

with a buyer, it runs the risk of disadvantaging its bargaining power. Therefore, a certain amount of trust between the partners is necessary. Susarla et al. (2011) find that trust indeed increases the positive impacts of information integration and coordination on the performance of the supply chain.[20]

3.2.3 Switching Costs

When industry faces higher costs to switch suppliers, the supply group will be able to capture more of the profit created in the value chain. The advent of the B2B electronic marketplace with its "many-to-many connectivity" was initially seen as lowering switching costs (Mitra and Singhal 2008; see also Porter 2001) and facilitating inter-firm collaboration (Vickery et al. 2003). Choudhury (1997) refers to the lowered search cost and better identification of sources of supply as the "brokerage effect" of e-business. However, due to the high degree of integration necessary for successful VSCI (as discussed above), lock-in may raise switching costs. An industry member therefore faces a difficult choice of how much to invest in the relationship with a supplier to ensure successful collaboration. Too much integration may lead to a loss of bargaining position, as discussed above, while too little may degrade the performance of the value chain. Susarla et al. (2011) cite a "lack of inter-organizational collaboration" as a fundamental reason for poor results from information integration initiatives. Missing out on the potential cost reductions from successful VSCI may be quite costly for firms: Efendi et al. (2007) find that firms adopting buy-side B2B systems increased their average return on assets by nearly three percentage points and their average profit margin by 2.7 % points, relative to a matched sample of non-adopting businesses.[21]

3.2.4 Downstream Integration by the Supplier Group

The threat by a supplier to enter the downstream market and compete with the buyers if industry profits are too high can degrade the bargaining position of the industry. The impact of e-business on this threat depends in part on the role that ICT plays in generally changing entry barriers in the downstream industry. Setting aside entry barriers, which were covered above, the threat of downstream entry by the supplier group may be lessened by ICT, since one of its main effects is to increase the attractiveness of vertical *dis*integration. That is, outsourcing is the economical alternative in more situations than ever before because of the reduction in transaction costs and the lower cost of effective intermediation brought about by

[20] Susarla et al. (2011) measure trust with the extent of collaboration between suppliers and buyers, attitudinal willingness to transact with the exchange partner, and the comfort-level reported by exchange partners in their survey data. Performance of the supply chain was measured with the incidence of stock-outs.

[21] See Prieger and Heil (2010b) for a review of other empirical studies of the benefits of VSCI.

e-business.[22] With the relative attractiveness of vertical disintegration increasing due to e-business, the threat of supplier integration into downstream markets is accordingly made less credible.

3.3 Power of Buyers

When the power of buyers of the industry's output is large relative to that of the industry, the firms in the industry will be able to appropriate less of the value they create. Powerful buyers can force down prices and demand higher quality goods and services (Porter 2008). Since buyer power is just the other side of the supplier power coin, the same factors influencing the power of suppliers apply here (but in reverse). Thus, much of the relevant discussion for buyer power is already found in the previous section on the power of suppliers. In this section, we extend the B2B analysis by briefly discussing intermediaries, and then focus on B2C e-commerce, which was not discussed in Sect. 3.2.

Easy access over the Internet to information about products and suppliers can greatly reduce both buyers' switching costs and their reliance on intermediaries, thus increasing their bargaining power. However, intermediaries need not disappear, and may even become more important as reintermediation occurs. Furthermore, e-commerce firms have found creative ways to differentiate their products to reduce the attractiveness of other sellers' offerings.

3.3.1 Intermediaries and B2B Hubs

In some industries, disintermediation (the reduction of the use of market intermediaries to match producers to ultimate buyers) made possible by e-business has threatened the continued existence of firms playing the role of the traditional middleman. The decline of the leisure travel agency industry and the full-service brokerage industry provide good examples. Other examples include consumers buying books from Amazon or computers from Dell without visiting traditional, physical retail outlets. When e-commerce empowers buyers to cut middlemen out of the sales channel, then even if they survive, the power and profitability of the intermediaries is greatly reduced.

However, in other industries, e-business enables reintermediation, defined as the creation of new intermediaries or market makers (Berthon et al. 2003). The B2B vertical hubs or industry exchanges previously discussed are an example of a new channel that can threaten the dominance of traditional channels

[22] See Lucking-Reiley and Spulber (2001) and Parker and Anderson (2002) for general discussion; see Görg et al. (2008) for empirical evidence on outsourcing and improved productivity.

(Ravichandran et al. 2007; Mitra and Singhal 2008). However, truly disruptive B2B hubs may be uncommon, given that hubs aligned with existing supply chains have a higher chance of survival than those that seek to be pure substitutes for existing channels (Day et al. 2003). A separate issue is whether the hub is affiliated with sellers or buyers. In buyer-decisive hubs, buyers typically choose the pricing mechanism (e.g., the structure of auctions) and decide what is offered for sale and how it is presented. The power of sellers in such hubs is diminished, since they have no control over the set of transaction parameters (Ravichandran et al. 2007).

3.3.2 B2C E-Commerce and Product Differentiation

If the industry's products are relatively undifferentiated, then buyers hold power over individual sellers because of the credible threat to take their business elsewhere. E-commerce has changed the nature of product differentiation in some industries, particularly in retail. When search costs are high and buyers hold little information about products and alternatives (e.g., before the Internet), brand building is a winning strategy to stimulate demand for a company's products. A customer may not be able to find the best product that meets his needs, but if he has had positive experiences with other products in the brand he may be more likely to buy the brand this time. Siaw and Yu (2004) argue that branding in this sense becomes much less important in the new economy, because the buyer has more information and lower search costs. Branding offers less product differentiation in e-commerce than it did in the old economy. Morton et al. (2001) demonstrate the potential for informed customers to squeeze retail margins, finding that users of an online car-buying service paid less for vehicles than offline customers, and that three-fourths of the difference in prices stemmed from the site's provision of information to the consumer.

However, ICT allows firms to differentiate their products in other ways even when the final consumption goods or services are identical. For example, Maryanchyk (2008) shows that the movie rating information on Netflix provides effective signals of quality, and therefore value, to consumers. Maryanchyk (2008) concludes from his sophisticated econometric analysis of ratings and demand for movies that "[i]f Netflix were to offer DVDs without providing the rating service, 88 % more consumers would choose movies elsewhere" or would choose not to watch a movie at all.

The mass customization of product lines (e.g., Dell's system of allowing buyers to choose features of their computers, or Home Depot's online system allowing customers to customize garage doors for purchase[23]) and hyperdifferentiation, which Clemons (2008) defines as "the ability of firms to produce almost anything

[23] To illustrate mass customization, consider just one line of residential garage doors out of the several offered through HomeDepot.com: Clopay's Coachman line. With the various options for style, color, materials, and hardware, there are 844,800 combinations for a doublewide door from which to choose (authors' calculations, as of March 2012).

that any potential customer might want," made feasible by e-commerce do not necessarily confer an advantage to a particular firm. If one firm can hyperdifferentiate its products, it is likely another can, too, and buyers may still regard the set of options provided by the two firms as close substitutes (Clemons et al. 2005; Clemons 2008). The ability to differentiate a product to gain power in the value chain is further compromised in some industries by informational issues. For example, online stamp auctions have been shown to suffer from adverse selection, since potential buyers cannot verify the quality of the goods ex ante. The general lowering of quality in such auctions leads to lower sales prices, since many customers are knowledgeable enough to respond rationally to the adverse selection and drop their bids (Dewan and Hsu 2004). Conversely, when consumers trust e-tailers, Pan et al. (2002) show that the sites have more traffic and can charge higher prices. However, motivated (if unscrupulous) sellers can sometimes exploit the informational asymmetries inherent in online transactions by attempting to fool buyers. Jin and Kato (2006) analyze attempts to defraud consumers in online auction markets. They find that in general, some consumers are both uninformed and trusting of (and willing to pay a premium to) sellers who overstate product quality without offering proof.

3.3.3 B2C e-Commerce and Other Factors

E-business can affect other factors important to buyer power besides product differentiation. Lower search costs and the expanded threat of substitutes furnished by the Internet increases the sensitivity of buyers to prices. However, e-commerce greatly lowers the cost of gathering and storing information about customers' past purchase behavior and present desires, which can be used in what Clemons (2008) terms "resonance marketing." Sellers who know exactly what their customers want and who expend the effort to customize products to match can "reduc[e] the role of price in the consumer's shopping decisions" (Clemons 2008).

The aggregation or purchase volumes of the buyers as a group also affects their power, in e-commerce as in the old economy. The marriage of ICT and e-commerce allows buyers to aggregate and coordinate their bidding for goods and services. Despite the failure during the dot.com bust of many "online community marketing" ventures, in which clusters of buyers with similar preferences could aggregate their demand to command discounts (Gensollen 2007), demand aggregation is attaining its second wind. Demand aggregation in B2C e-commerce has re-appeared everywhere from the retail sector (e.g., Groupon, LivingSocial, and their ilk) to healthcare (Rensmann and Smits 2008).[24] Regarding purchase volume, Rosen and Howard (2000) postulate that the relatively costly distribution model of

[24] Rensmann and Smits (2008) describe CareAuction, a reverse auction platform in The Netherlands supporting the allocation of requests from individual maternity care patients (via their insurance companies) to care providers.

e-commerce (i.e., shipping to the home) implies that frequently purchased products (e.g., groceries) will experience less online market growth. Eppright and Hawkins (2009) find empirical support for this hypothesis in their study of B2C markets.

3.4 Threat of Substitutes

When there are highly substitutable products readily available to buyers of a firm's goods and services, the firm's profitability will be lower than when such substitutes are less attractive, affordable, or available. Some of the factors affecting this threat to profitability include the closeness in product and price space of the substitutes and the buyers' switching costs. The Internet's most visible impact on the threat of substitutes may be in the realm of information goods. For goods that can be digitalized or already exist in digital form, such as books, music, movies, and software, e-commerce greatly expands the market offerings by providing a host of new substitutes to physical goods (e.g., paper books, movies on DVDs, software on disc in a shrink-wrapped box). Porter (2001) emphasizes the role of the Internet in creating new substitutes, although Karagiannopoulos et al. (2005) argue that Porter overstated this threat, contending that in the dot.com boom years the market signals regarding entry of substitutes were highly distorted.

Before examining how the Internet and other ICT changes the nature of the threat to profitability from substitutes, it is worth noting that in markets for information goods a substitute becomes an appealing target for acquisition. That is, Bakos and Brynjolfsson (2007) show that a large bundler of information goods increases the profit extracted from a good by adding it to the bundle, even if the bundler already sells a substitute good. Since adding the substitute to the bundle increases its value, the substitute good is ripe for acquiring through purchase of the underlying intellectual property rights or outright merger.[25] In such markets, the threat of a substitute may be transformed into a promising addition to profit.

Bundling and offering a wide array of products are especially attractive in e-commerce, because an online seller can offer for immediate sale many more goods than a typical main-street competitor, due to the latter's space limitations and inventory costs. A decade ago, Amazon.com already had at least 23 times as many books as a typical large physical store, over 17 times as many CDs, 12 times as many DVDs, and eight times as many digital cameras, MP3 players, and flatbed scanners (Brynjolfsson et al. 2003). Selling more products draws e-customers, for extensive product selection leads consumers to shop online (Ernst and Young 1999). Unsurprisingly, product lines for which customers place a high value on having a large selection of goods from which to choose have higher online market

[25] If the substitute good is more profitable to the large bundler than to a stand-alone rival, then the fundamental idea of gains from trade imply that, absent other considerations, the two parties will be able to agree upon a transaction that transfers sale of the product to the bundler, gives a payment to the rival, and makes both sides better off.

share and growth (Eppright and Hawkins 2009). The expanded set of product offerings has generated a "long tail" in retail e-commerce, with more consumers choosing to purchase the least popular elements items than before (Anderson 2006).

3.4.1 Good Substitutes Versus Poor Substitutes

It is difficult to earn profits in mass market categories, with their high degree of sameness among competing products, and the ease of search in the Internet age exacerbates the challenges for firms. For example, Ellison and Ellison (2009) found that computer memory modules sold online had product-specific demand elasticities of −20 or more, indicating that the market was nearly perfectly competitive.[26] Increasingly informed customers, however, need not be detrimental to the savvy firm that finds, creates, and exploits "sweet spots" in the fringe of the mass market. Clemons (2008) advises profit-seeking firms that "[s]uccessful new offerings will be designed around gaps in the marketplace, not designed around the firm's current portfolio of offerings, or based on the firm's current strengths." The wedding of the information age to e-commerce allows customers to find obscure products as never before.

ICT can also be harnessed to increase differentiation of a firm's product or service, decreasing the attractiveness of substitutes. For example, in markets where technological standards are important but not uniform, choosing the less-common standard can highly differentiate a firm's offering. Augereau et al. (2006) demonstrate the profitability and empirical significance of the "anti-bandwagon" strategy in the ISP market, in the days of competing standards for 56 K modems.[27]

Whether online sales pose a threat to traditional retail outlets depends on how important immediate gratification is to the customer. When buyers place a high value on instant satisfaction of their desires after purchase, goods sold online are poor substitutes for brick-and-mortar offerings, even if prices are lower online (Rosen and Howard 2000). The importance of immediate gratification in a product line is significantly and negatively associated with online market growth (Eppright and Hawkins 2009).

3.4.2 Buyer Switching Costs

When a buyer faces a high switching cost to substitute away from a firm's product, a competing product that otherwise might be a good substitute can turn into a poor one. Switching costs are empirically relevant for e-commerce sites. Yen (2010), in

[26] With a demand elasticity of -20, the theory of pricing with market power suggests that the relative markup (or Lerner Index, defined as the ratio of price less marginal cost to price) a firm could set is just 5 %.

[27] In particular, Augereau et al. (2006) show that ISPs were *less* likely to adopt a particular modem standard the *more* that competitors adopted it.

his study of 425 online shopping customers, shows that buyer loyalty to a website is positively associated with switching costs, as measured by the customer's concerns about difficulty in finding alternative websites, loss of information regarding transaction history, and uncertainty about the service quality of alternative sellers. However, Yen's (2010) findings also indicate that to take advantage of locking in loyal customers, the seller must reduce the perceived risk for consumers by convincing them their credit card and personal information will be safe, that the likelihood of shipping damage is low, and that it will be relatively easy to contact customer service.[28]

A prominent part of switching costs in some markets are the search costs a consumer must incur to find suitable substitutes. Internet search for e-commerce can greatly lower search costs in many markets (Bakos 1997). Goldmanis et al. (2010) hypothesize that as search costs decline due to e-commerce, price levels and dispersion decrease in the industry. The authors confirm their hypothesis using a large data set of travel agencies, bookstores, and new car dealers, indicating that in these industries search costs indeed fell due to e-commerce. They also find that high-cost firms disproportionately lose market share, and are more likely to be forced out of the market.

However, despite the importance of search costs in many markets, and the role of the Internet in reducing them, there are some nuances involved. When there is heterogeneity in the degree of customer "informedness" (Clemons 2008), high search intensity may arise only for large purchases, and reduced search cost may actually *increase* margins in some cases (Janssen et al. 2007). The latter result occurs when both search engine adoption and the size of the purchase are low, for in that case more less-informed consumers enter the market.[29]

Sponsored search and obfuscation are other factors in the relationships among the Internet, search cost, and the threat of substitutes. Since low-quality firms have the most to gain from sponsored search, wherein firms purchase placement in online search results, sponsored search carries the potential for adverse selection. Animesh et al. (2010) find empirical support for this notion: particularly for experience and credence goods, lower-quality goods were often ranked higher in Yahoo! search results (but, interestingly, not in Google search results). The ability to attract sales through sponsored search may increase a firm's profitability in the short run but not the long run, depending on the severity of adverse selection and customer learning. Obfuscation can also mitigate the damage to an industry's profitability from lowered search costs. In this context, obfuscation is the deliberate attempt by online sellers to confuse buyers and defeat price search technology. Obfuscation can include complicating product descriptions, creating multiple product versions, and hiding the cost of add-ons. An e-tailer can obfuscate

[28] See also Bonera (2011) and Cao et al. (2005) on the importance of perceived security and trust to customers in e-commerce.

[29] Given the high degree of comfort with and the prevalence of search engine usage today in most developed nations, this result may have current relevance only to emerging markets where e-commerce is in a nascent stage.

to raise search costs, decrease consumer learning, and raise profits. One sophisticated analysis found that online retailers successfully obfuscated to raise markups on computer parts (Ellison and Ellison 2009).

3.5 Rivalry Among Existing Competitors

Porter's fifth force is the nature of the rivalry that exists among competitors in the market. Factors affecting rivalry include market structure, industry growth, the degree of substitutability among rivals' products, the cost structure of the industry (fixed versus marginal cost), and the indivisibility or "lumpiness" of capacity expansion (Porter 2008). E-commerce has some obvious impacts on the nature of rivalry. A firm's e-commerce web site can be readily observed and copied by rivals, reducing differences among competitors. The reduction in variable costs due to e-business (sometimes down to zero, as with information goods) may encourage fiercer competition in prices, squeezing firms' margins (Bakos and Brynjolfsson 2007). In other industries, reductions in fixed and sunk costs can alter the market structure by encouraging entry. Given the varied ways in which e-business can affect markets, it is perhaps not surprising that the empirical evidence on how e-commerce affect price levels and prices dispersion is mixed.

3.5.1 General Factors Affecting the Intensity of Rivalry

The market structure of the industry affects rivalry among firms.[30] Porter (2008) suggests that when firms have roughly equal market share, poaching of each other's customers is difficult. Furthermore, the lack of a clear industry leader to institute and maintain practices favorable to the industry's profits, such as sharing information on prices or output (which facilitates tacit collusion)[31] or price leadership, may lessen the profitability of markets without a dominant firm. Innovations in ICT such as electronic market exchanges and vertical hubs may accentuate advantages some firms already possess in the market structure. Mitra and Singhal's (2008) event study shows that the expected increase in profitability from joining an industry exchange is highest for firms that already have the greatest cost efficiency and inventory performance. Thus, if there is a dominant firm in the industry, B2B exchanges can further cement its leadership role. ICT can also change the market structure directly. Outsourcing and cloud computing reduce the capital requirement for entry into an industry. Thus, Qu et al. (2011)

[30] Given that Porter's (2008) Five Forces model is rooted in the older "Structure-Conduct-Performance" view of an industry, his work pays less attention to the ways that rivalry itself shapes market structure, as the "New Industrial Organization" focuses on (see, for example, Jacquemin (1987) and Tirole (1988)).

[31] See Pepall et al. (2005, p.364).

hypothesize that ICT outsourcing will be negatively associated with industry concentration (see also Etro 2009). However, in their sample of 59 US industries, they find only modest statistical support for the hypothesis.

In general, slower industry growth leads to more price competition, as firms must fight to steal business from each other rather than expanding the market. However, e-commerce in its rapidly growing phase may reverse the direction of this association. When consumer use of the Internet is nascent, firms may feel compelled to give away their goods and services for free to grow the market rapidly, even when they plan to eventually charge customers. Bakos and Brynjolfsson (2007) cite Buy.com's early "hyper-aggressive pricing strategy," which resulted in negative margins on some products, as an example of a firm attempting to build a reputation for low prices during the high-growth phase of retail e-commerce. Clearly such strategies are high-risk and unsustainable in general, even if they establish the eventual "winners." Indeed, Nikolaeva (2007) finds in her study of e-commerce firms during 1994–2003 that the hazard rate of e-tailers is positively correlated with the growth rate of the industry, when such strategies are most likely to be employed.[32] The impulse to pursue a penetration-pricing strategy may be especially irresistible when marginal cost is negligible, as with information goods.

3.5.2 Factors Specifically Affecting Price Competition

Several of the factors influencing others of the Five Forces, such as the degree of substitutability among competitors' products (buyer power) and the ratio of fixed to variable cost (the threat of entry), also directly change the nature of price competition. The existence of many good substitutes, and the ease with which customers may find them on the Internet, can lead to more vigorous price competition. However, e-commerce firms need not compete in isolation against rivals, but instead can form coalitions through electronic marketplaces and web sites selling goods from multiple firms. In their model of coalitions among competing firms, Laye and Tanguy (2007) show that an e-tailer has incentives to join a coalition with other firms, particularly those selling less-close substitutes (a "non-connex coalition"). When customers must bear search costs, the coalition brings in more customers than separate sites do, because a consumer finding any firm in the coalition automatically finds them all. Examples of such coalitions are B2C exchanges such as Amazon or Buy.com. An intriguing result of the model is that prices are lower within non-connex coalitions than in coalitions with firms selling closer substitutes ("connex" coalitions), because in the non-connex coalition firms attempt to steal market share from the close substitutes that are outside the coalition. Nevertheless, profit is higher in the non-connex coalition than in either the connex coalition or the non-coalition cases.

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[32] A firm's hazard rate is its probability of exiting in the current period, conditional on surviving up to that period. See also evidence from Goldfarb et al. (2007), who show that even though the "Get Big Fast" strategy pursued during the dot.com boom may not have been optimal, it may not have led to increased chances of a firm's failure due to counteracting effects.

We have already discussed above some of the implications of information goods for price competition. When nearly all cost to offer a good is fixed cost, cutthroat pricing and giving away the product for free can result. Industries with such cost structures sometimes also face indivisibilities in their investment costs. If fixed costs are important, and capacity must be expanded in large discrete increments, then in addition to the above considerations the overcapacity problem will lead to additional pressure to cut prices. However, despite the role of information goods in creating the problem, e-business may also help to alleviate pressure from high fixed costs through outsourcing and cloud computing. That is, ICT can create near-continuous scalability and expansibility of capacity for a given firm, even though the underlying assets required as capital goods may be highly indivisible. For example, instead of setting up in-house processing capacity by buying large computers, with their attendant costs for infrastructure and skilled labor, a tech startup firm today is more likely to purchase as much access to a third-party server farm as it requires (indeed, the firm's venture capitalists will probably insist upon it). Qu et al. (2011) describe such ICT outsourcing as providing an option to defer sinking the firm's capital into in-house ICT, and find that ICT outsourcing is positively correlated with the dynamism of the industry (as measured by the variance in the industry's estimated output growth). Such outsourcing converts large fixed costs into smaller variable costs, and can thus obviate the problems that overcapacity can create for sustaining margins.

4 e-Business and Nonprofit Organizations

Widespread availability and adoption of ICT affects nonprofit and governmental organizations as well as business. Some considerations regarding how e-business affects nonprofit organizations are similar to what has been discussed above. For example, Porter's Five Forces analysis has been applied to the use of the Internet as a competitive tool for public schools in the education market (Lee et al. 2001). However, there are far fewer studies looking specifically at the impact of e-business on nonprofit ventures (Finn et al. 2006).[33] Even when a "for profit" mindset or lens is used to examine e-business in nonprofit settings, some differences arise. Davila et al. (2003) find in their survey of 168 North American organizations that e-commerce purchasing consortia are more common among nonprofits than for-profit firms. Overall, however, ICT adoption in general has lagged among nonprofit organizations, private or governmental, compared to the private for-profit sector (Schneider 2003).

Not all e-business practices from the corporate world transfer well to the sphere of nonprofit enterprises. Adoption of e-commerce platforms to facilitate receipt of donations (e-philanthropy) can lower administrative costs, but turnkey e-commerce solutions designed for selling products may be inappropriate. Waters (2007) argues

[33] See also Zorn et al.'s (2011) survey of the literature on ICT adoption and use among nonprofits.

that nonprofit web sites using terms such as "shopping cart" and "checkout" when soliciting donations take the donor's focus off of the philanthropic motive, and can blunt the desire to contribute. In possible confirmation of this notion, first tier nonprofits on the Philanthropy 400 list were much less likely to use such e-commerce terms on their web sites than were second tier organizations (Waters 2007).

Apart from the usual motives of increased efficiency and cost reduction, nonprofits have other motivation to adopt e-business. Environmental (or "market") factors such as the increasing competitiveness of philanthropy markets may spur nonprofit enterprises into adopting ICT. However, empirical support for the importance of such environmental factors is weak (Zorn et al. 2011). Perhaps more important for nonprofits is their adoption of ICT as a "symbolic resource" to establish legitimacy, burnish their reputations, and satisfy requirements from outside organizations (such as the government) to which they are accountable (Zorn et al. 2011).

The largest nonprofit sector to embrace ICT is government. A separate study would be required to thoroughly explore the implications of e-government, the use of ICT in government (Layne and Lee 2001). In brief, however, it is important to note that since government is often the monopoly supplier of the goods and services it provides (e.g., business licenses, police protection, and receipt of taxes), it does not face the same competitive stimulus to adopt ICT as the business sector. Peristeras et al. (2009) cite the lack of competitive pressure, as well as the fact that public administrations are large, complex, distributed systems as reasons why "governments all over the world … are still far from satisfying their constituents, as they usually operate inefficiently and ineffectively" despite heavy investment in ICT in recent decades.

Appendix: Summary Table of e-Business Factors and Implications for Strategy

Subject and place in chapter outline	Summary	Implication for strategy
2. Macroeconomics		
2.1. Size of e-commerce	E-commerce has increased considerably in the developed world in the last 20 years. B2B e-commerce, the predominant form of e-commerce, accounts for nearly a third of all B2B transactions. B2C e-commerce accounts for only 2.8 % of B2C e-commerce. Developing nations have yet to witness considerable gains from e-commerce	E-business is increasing in importance and cannot be ignored by strategists. First-mover advantages may be available in developing countries

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Subject and place in chapter outline	Summary	Implication for strategy
2.2. Productivity and economic growth	E-business affects economies by increasing productivity (through additional capital formation) and may spur innovations in processes that will further increase productivity over the long term. Investments in ICT have clearly increased economic growth in many developed countries. The evidence is mixed in developing nations	While adopting ICT by itself may not confer lasting competitive advantage, failure to do so will surely put an organization at a disadvantage
2.3. International trade	E-business improves opportunities for increased specialization which increase the gains from international trade. Little research, however, exists on the impacts of e-business on trade. A lack of infrastructure, poorly trained workforces, and regulatory obstacles may reduce any potential gains from trade for developing nations	Firms could find international trade more profitable with e-business. Trading opportunities in developing nations may not prove profitable in the short-run
2.4. Monetary policy		
2.4.1. E-business and prices	Overall, e-commerce is expected to increase competition and reduce search and transaction cost. The net effect will be lower prices. In the long run, these lower prices will represent a onetime change in the price level	In the aggregate, firms will face increased pressure to lower prices, but individual industries may avoid price reductions through product differentiation and increased customization
2.4.1. E-business and menu costs	The costs associated with inflation, namely menu costs (the cost of physically changing prices) could be dramatically reduced with e-commerce. Nevertheless, price rigidities will likely remain a fact of business even with greater adoption of e-commerce	Firms can more readily change prices in the wake of inflation and other price shocks. However, e-business does not eliminate all costs associated with price changes
2.4.2. E-business and the money supply	E-payments and e-money present futures challenges for policymakers who may find normal monetary policy tools less effective with the proliferation of e-payments and e-money. Practically speaking, e-commerce has had little effect on monetary policy to date	Sellers must consider whether to adopt e-payment systems for online and offline sales to avoid falling behind rivals

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Subject and place in chapter outline	Summary	Implication for strategy
2.5 Fiscal policy and taxation	E-commerce reduces geographical constraints and increases interstate and international transactions. Governments fear these transactions will reduce sales tax revenue. Revenue losses are small to date, but policymakers are increasingly exploring options to tax these transactions	Firms conducting interstate or international transactions will likely face increased pressure to collect sales tax revenue on behalf of their buyer's governments
3. Microeconomics		
3.1. Threat of entry		
3.1.1. Economies of scale and scope	E-business may increase economies of scale in industries where fixed costs are unchanged, but variable costs are reduced	Minimum efficient scale increases and the threat of entry falls
	E-business may decrease economies of scale in industries where e-business reduces fixed costs	Minimum efficient scale decreases and the threat of entry rises
	E-business may increase economies of scope and aggregation, particularly in information goods	The threat of entry decreases because rivals must enter with a bundle of goods
3.1.2. Network effects	E-business may increase the importance of network externalities enjoyed by incumbents	The threat from entrants on competing networks is reduced
	E-business may encourage subsidization of one side of a platform market	Entry barriers in the subsidized side of the platform fall
	E-business encourages the proliferation of two-sided (platform) markets, which may be subject to "lock in" of complementary goods	Application barriers to entry may arise from such vertical restraints
3.1.3. Capital requirements and sunk costs	E-business enables ICT outsourcing, converting fixed, sunk cost into variable cost	The threat from entrants increases as the importance of sunk costs declines
3.1.4. Unequal access to distribution channels	E-business decreases the importance of physical location in prime real estate	Entry barriers fall
	E-business B2B vertical hubs may be owned and controlled by large incumbents	B2B vertical hubs may be able to dominate supply and distribution channels, effectively limiting opportunities for new rivals

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Subject and place in chapter outline	Summary	Implication for strategy
3.1.5. Other advantages of incumbency	E-business decreases the importance of face-to-face trained sales force	Entry barriers fall
	E-business and outsourcing decrease the importance of physical nearness to skilled labor	Entry barriers fall
	Early entry into e-commerce confers initial but not necessarily lasting advantages to incumbents	Entry barriers decrease over time
3.2. Power of Suppliers		
3.2.1. Concentration of the supplier group	E-commerce may increase the number of sellers and facilitate greater transparency of product prices and cost structures	Suppliers could see reduced power over industry
	Suppliers (incumbents) may maintain control over B2B vertical hubs	Suppliers could see increased power over industry
3.2.2. Dependence of the supplier group on the industry	E-business reduces transaction costs between supplier and industry	Suppliers lose ability to extract rents from industry, as firms can more easily contract with competing suppliers
	E-business and vertical supply chain integration tightens bonds between supplier and buyer	Supplier loses bargaining power due to the hold-up problem
3.2.3. Switching costs	E-business reduces switching costs through the brokerage effect.	Lower switching costs of buyers reduce supplier power.
	Buyers may make significant investments in vertical supply chain integration	Higher switching costs of buyers increase supplier power
3.2.4 Downstream integration by the supplier group	E-business can increase vertical disintegration through outsourcing	Reduced incentives for suppliers to enter downstream markets lowers supplier power
3.3. Power of buyers		
3.3.1. Intermediaries and B2B hubs	E-business spurs disintermediation in industries such as travel agency service and brokerages	Intermediaries' power (and even existence) is threatened
	E-business spurs reintermediation through B2B vertical hubs	Intermediaries' power is strengthened

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Subject and place in chapter outline	Summary	Implication for strategy
3.3.2. B2C e-commerce and product differentiation	Information and search costs are reduced with e-commerce, and branding may become less important	Product differentiation through branding decreases, and buyer power increases
	E-business allows new forms of product differentiation, such as online ratings supplied by past customers	Product differentiation increases, and buyer power decreases
	E-business allows firms to offer greater customization of products and services, such as computers sold to order	Product differentiation increases, and buyer power decreases
	Informational problems such as adverse selection E-business allows firms to offer greater customization of products and services, such as computers sold to order	Product differentiation increases, and buyer power decreases
3.3.3. B2C e-commerce and other factors	E-business enables gathering information about customers and resonance marketing	Sellers can ability to extract value from buyers
	Consumers might be able to aggregate demand (Groupon, LivingSocial, etc.)	Buyer power increases, resulting in lower prices and higher quality
3.4. Threat of substitutes		
3.4.1. Good substitutes versus poor substitutes	E-commerce enables consumers to more quickly identify and purchase substitutes for a firm's products	The power of any one seller decreases
	Increasingly informed customers can easily find firms offering unique products filling gaps in the marketplace	Firms selling unique products can market share
3.4.2. Buyer switching costs	E-commerce reduces search costs and therefore decreases switching costs for consumers in markets where they are willing to search for alternatives	Seller power declines, and price levels and dispersion fall
	E-commerce allows firms to reduce the efficacy of search engines (through sponsored search) and to obfuscate prices and products	The consumer's ability to compare prices and products falls, allowing firms to raise profits

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Subject and place in chapter outline	Summary	Implication for strategy
3.5. Rivalry among existing competitors		
3.5.1. General factors affecting the intensity of rivalry	ICT, electronic market exchanges, and e-business vertical hubs may enhance the market share of the largest incumbents	Where significant differences exist between firms, the impact of e-commerce on market share will likely be greater
	E-business-enabled outsourcing and reduced capital requirements for entry may make market structure more competitive	Incumbent suppliers lose power and market share
	In the wake of e-commerce innovations, firms may attempt to capture a significant portion of the market share through aggressive pricing strategies, particularly for goods with very low marginal costs (e.g., information goods)	Competitive rivalry among sellers in the industry heats up, and seller power in general decreases
3.5.2. Factors specifically affecting price competition	Firms may join a coalition of competing firms selling less close substitutes in a B2C exchange	The coalition can attract more customers to its site than any one company could, and seller power increases
	E-business lowers variable cost relative to fixed cost, making overcapacity problems relatively greater	Overcapacity in industry leads to cutthroat pricing; competition among sellers increases and prices fall
4. Nonprofit organizations	Nonprofits attempt to adopt e-commerce practices from the for-profit sector, such as using terms like "checkout" when soliciting donations online	The commercialization of the donation process leads philanthropists to decline to contribute to the nonprofit
	Nonprofits adopt ICT as a symbolic resource	The nonprofit establishes legitimacy and improves its reputation among donors and accountability organizations

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Part II
Evolved Strategic Framework for the Management of Companies

Towards a New Understanding of the e-Business Strategic Process: The Rise of a Dynamic Interaction-Based Approach

Reimer Ivang

Abstract In the early 1970s, strategic planning was introduced onto the corporate management scene and since then it has been a dominating conceptual frame for understanding and designing various strategies in the corporate world. Nearly a decade later, strategic planning has been used by various scholars to explain how companies could strategize in the field of ICT and e-business. Strategic information systems planning (SISP) is an example of this application of strategic planning in the field of e-business. The prominence of SISP within the corporate IS strategy literature has been dramatic, but today there exist other different understandings of how strategies are emerging. However, e-business strategic literature is still dominated by the planning e-business approaches. The question therefore remains: Is it still optimal to build a static, programmed analytical information plan, or must the e-business strategic process adapt to changes in the planning environment and internal changes within the organization? E-business strategy, because of increased uncertainty and environmental complexity, must encourage interaction between key stakeholders that implement and use the e-business technology. The literature reveals the lack of a dynamic theory of e-business strategy. The current paper proposes an e-business strategy conceptualized as a dynamic interaction-based process, in which several organizational components co-create the e-business strategic framework of the company. The process is based on group-learning processes where the strategy emerges though the processes of action and reflection. These experience-based group-learning processes help organize the process of e-business strategizing so that improvisational and dynamic competences can emerge.

Keywords e-Business · Strategizing · Value creation · Competitive advantage · Group learning · Experience-based learning

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1 Introduction

It is generally agreed that, in order to stay competitive, organizations need a strategy for utilizing digital applications; therefore, most organizations today are involved in developing and implementing e-business strategies. In this research handbook on e-business strategic management, it is logical to set forth the different approaches that exist for developing and implementing an e-business strategy. Early attempts to formulate e-business strategies concentrated on the analytical task of deriving e-business strategies from business plans. The limitations of these analytical and planning-oriented approaches, however, were soon discovered. The critics suggested informal and incremental e-business strategic development and implementation to ensure flexibility, creativity, and strategic thinking in the development of emergent strategies.

In previous e-business strategic research (Sambamurthy et al. 1994; Philip 2007; Newkirk and Lederer 2006; Segars and Grover 1998), a contradiction appears between published planning methods and the generally held views about effective implementation of e-business strategies. More to the point, new case studies (Hamel and Breen 2007) of such successful e-business pioneers as Google, Facebook, and Amazon clearly illustrate that these firms have not adopted formal planning and analytical approaches to e-business strategizing and implementation.

The explicit e-business strategic methods described in the literature predominantly assume a comprehensive e-business strategic process. Despite the fact that many researchers (Pyburn 1983; Vitale et al. 1986; Earl 1993; Bondarouk 2006, Bhandari et al. 2004) consider incremental approaches to be more effective, methods that can be used to facilitate emergent e-business strategizing are few and not detailed enough. Important topics in e-business strategic management include the process, tools, and activities that result in an e-business strategy. All of these elements are relevant in the daily life of managers on different levels who are constantly faced with the challenge of developing e-business strategies.

For companies and managers, uncertainty has become a way of life, and they are finding it increasingly difficult to predict changes in their environments (Luftman 1996). Environmental turbulence increases the risk of e-business investment failures (Salmela et al. 1996). E-business decisions are characterized by increasing complexity, and emergent interaction-based approaches can enable decision-makers to draw on their intuition and support improvisation in the e-business strategic process. This contribution, therefore, takes a closer look at an alternative approaches to developing and implementing e-business strategies. The goal is to present a different methodology that can be applied to e-business strategic thinking—an approach that is more dynamic and interaction-based.

This approach has, so far, been underexamined in the e-business strategic literature (Salmela and Spil 2002; Ivang et al. 2009); therefore, it is important to analyze it more closely. This chapter provides an understanding of the dynamics in the approach and opens the organizational black box in order to investigate how different organizational components optimally work together to develop a

competitive advantage in e-business. Section 2 begins with a brief look at the digital revolution and how this revolution impacts an organization's external and internal e-business environment. In Sect. 3, the normative and descriptive approaches to strategy are explained; this explanation is carried forward into Sect. 4, in which the dominant approaches to e-business strategy are explained. Section 5 explains the dynamic, interaction-based approach to e-business strategic thinking.

2 Digital Revolutions: A Look Towards the Challenge

Before engaging in a more detailed discussion of e-business strategy, it is necessary to begin with a rigorous look at the digital technology itself and the evolution[1] that digital technology has undergone during the last decade. The objective is to compare this evolution with the development that similar technological revolutions have experienced. The result of this concise reflection on the course of technological change is to show that it is not constant, but is sometimes quite rapid, as in the early days of the Internet. This dynamic development of the digital technology introduces uncertainty into the strategy process; managers can get stuck simply doing nothing. Therefore, the course of technological change is important for managers to understand in order to develop successful e-business strategies.

The cyclical pattern of technological development does not involve a short cycle of five to 10 years like the business cycle, it is instead much longer. The idea of a long cycle was introduced by Nicholai Kondratiev (1892–1938), a Russian economist who founded and directed the Institute of Conjuncture in Moscow in the 1920s (Freeman and Loucã 2001). The idea of a long wave cycle was taken up by Joseph Schumpeter, who came across Kondratiev's work in Germany before he moved to Harvard University USA. Later Schumpeter put forward the idea that each long wave represented the application of a new group of technologies, each of which had a very powerful transformative effect on the economy, effectively bringing about another industrial revolution.

When comparing technological developments that result in industrial revolutions, it can seem surprising that the comparison covers three decades and not a much shorter period. Nevertheless, this is one of the more important discoveries revealed by the long wave theory. According to the long wave theory, technological revolutions are often spread over a longer period from the time of the initial

[1] The use of the terms "evolution" and "revolution" alternates in this chapter, but both concepts should be considered in the context of technological revolutions spreading over the first invention of technology until it is generally accepted and incorporated into different levels of society. However, it is easier to understand the process in which technology becomes accepted in society if presented in terms of "evolution," as many small adaptations seen together constitute the process in which "revolution" becomes reality.

innovation until the respective technology has found its place as an integral and a natural part of daily life for both consumers and companies. Comparing different technological revolutions reveals an often forgotten perspective on a development that is exhaustively described by the media. The development attracted much attention in the beginning of the new millennium, when the dot-com bubble burst and e-commerce and e-business were declared dead as concepts. The comparison also contributes valuable knowledge to e-business decision-makers, as it provides valuable insight into the current context of technological development and in turn the overall challenge that these decision-makers are facing.

The gist of this discussion is that the computer, the microprocessor, and digitalization should be regarded as a technical revolution in line with the printing press and the steam engine (Perez 2002; Freeman and Loucã 2001). It has often been claimed that digitalization will comprise the same importance for the economy as steam, railways, and mass production (Van Hoek 2001; Huizingh 2002; Perez 2002; Jelassi et al. 2014). The development can be divided into different periods and stages as illustrated in Fig. 1.

As shown in Fig. 1, the development is divided into two main periods, each of which contains several stages: (1) the installation period encompassing the changing and wildness phases; and (2) the application period encompassing the golden age phase and the adult phase. According to Perez, there is another stage, the collapse, between the two phases.

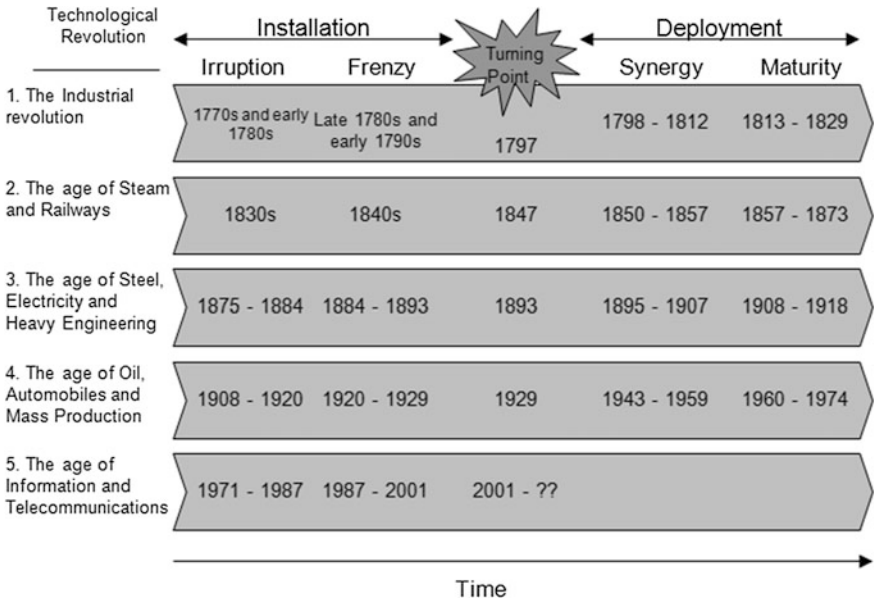

Fig. 1 Technological revolutions and their development (adapted from Jelassi et al. 2014; Perez 2002)

As can be observed in Fig. 1, technological revolutions stretch over significant periods of time, the time from the discovery of the original invention until its recognition in the existing economy often being considerable. Freeman and Loucã (2001) argue that we are currently experiencing a fifth Kondratiev long cycle.

The era of information and telecommunication began in 1971 with the introduction of the microprocessor, which made it possible to produce and market computers in sizes and at prices that enabled companies and individuals to own and use this new technology. This resulted in new transformative technologies, comprising computers, telecommunications, and the Internet, together with developments in biotechnology. These technologies have begun to transform our daily lives in myriad ways. According to Freeman and Loucã (2001), the "dot-com bubble" of the late nineties shares many of the characteristics of similar bubbles seen in earlier long cycles, such as the railway mania of the 1840s and the Wall Street crash of 1929. Based on the above, as well as on the analyses carried out by Perez (2002) and Jelassi et al. (2014), there are strong indications that digital technology in the beginning of 2001 enters the early Golden Age phase, when it diffuses to all parts of the existing economy.

Regarding this, Perez (2002) writes:

> The world of computers, flexible production and the Internet has a different logic and different requirements from those that facilitated the spread of the automobile, synthetic materials, mass production, and the highway network. Suddenly, in relation to the new technologies, the old habits and regulations become obstacles, the old services and infrastructures are found wanting, the old organizations and institutions are inadequate. A new context must be created; a new "common sense" must emerge and propagate. (p. 44).

The notion of the long cycle and technological revolutions posits a number of important implications for managers developing e-business strategies and academics trying to understand the development process. First, if technological change is cyclical, one can expect different results at different points in time; i.e., a given type of strategic approach will result in different success rates dependent on the environmental complexity at a given point in the long cycle. Second, Freeman (1986) shows how technologies often progress hand in hand with institutional changes. Each of the long cycles discussed in this section was associated with significant institutional change, such as education and training, industrial relations, corporate structures, systems of management, capital markets, and the legal framework. It, therefore, must also be anticipated that there are implications for managers that are engaged in e-business strategizing.

As can be seen in the above quote, the challenge for e-business decision-makers is to develop strategies that enable organizations to develop this new "common sense" in which digital technology is a natural part of everyday business. Before decision-makers reach this state, they will have to discover which new forms of value creation (Amit and Zott 2001) the individual company should pursue. This process of discovery is, however, seldom an analytical and planning-oriented process. It is a process by which the company has to challenge existing knowledge and wisdom to reap the new possibilities for value creation made possible by

digital technology. It is likewise necessary that senior staff, engineers, and customers be willing to relinquish traditional ways of acting and instead begin applying the new technology in areas where it makes sense and generates value. In other words, there is a great deal of learning involved in e-business strategizing during the current stage of the digital revolution.

Several authors (Pyburn 1983; Earl 1993; Segars and Grover 1998) note that organizational learning can be linked to effective-business strategizing. The transformation takes time and requires experimentation and adaptation. The digital revolution, as described above, is without a doubt one of the greatest forces in the perceived growing environmental uncertainty among companies (Luftman 1996). Therefore, the questions remain: How can companies best develop and implement strategies in the current phase of the digital revolution? What kind of strategic mindset is optimal when the challenge is to invent a new logic and learning, and develop a new common sense? In order to answer these questions, we must first briefly discuss the nature of strategy and the differences between strategies and strategic processes.

3 What is Strategy?

Parallel to many other concepts in the sphere of social science, there is no single accepted definition of the concept of strategy. The concepts of strategy and strategic processes have been studied since the early 1960s (Chandler 1962; Ansoff 1965), and later scholars (Porter 1980, 1985; Prahalad and Hamel 1990; Grant 1991; Barney 1991) have made seminal contributions to the strategy literature. Almost everyone agrees that strategy is important, yet almost no one agrees on what strategy is and how it is defined and practiced (Magretta 2003). Most researchers, however, accept that strategy deals with circumstances of great importance to an organization. Smaller matters in the organization will only be considered strategically important if they, for one reason or another, influence the organization in a significant manner, or if they constitute a new phenomenon that catches the attention of management. The dividing line between what is strategic and what is not is thus a more or less subjective judgment of what is important and what is not deemed important. As a consequence, the very concept of "strategic" becomes critical.

There have been several attempts to compile the various approaches to the phenomenon of strategy and in that way to draw the strategic map. One of the best-known attempts was conducted by Mintzberg et al. (1998), who compiled descriptive and normative approaches to strategy. The *normative approaches* normally focus on the content of strategy (e.g., which strategies a company should choose), whereas the *descriptive approach* focuses on the strategic processes (e.g., why the strategic processes operate as they do). The normative strategy literature is based on the assumption that senior staff can lead the company by means of rational decisions. The descriptive strategy literature considers the development of

strategy as a complex organizational process with which staff members at different levels in the organization are involved, and where the strategy is influenced by phenomena such as culture, power, or learning (Mintzberg 1999).

In sum, there is a big difference in the ways strategy is described in the literature, depending largely on who conceives the strategy, and if it is conceived of beforehand or if it can evolve as a pattern of actions. In essence, there are different understandings of how strategic processes unfold and who creates strategies. The process leading to a strategy can be described as: "Strategy processes are concerned with the how, who and when of strategy" (de Wit and Meyer 1998, p. 5). Thus, the process leading to a strategy deals with how and when strategies are created, as well as with which persons are involved in the strategy process.

A naive picture of a strategic process is a group of people, probably in black suits, disappearing into an office or a conference room, and then reappearing after some hours or days carrying a strategic plan written down on the basis of various analyses that define concrete suggestions. Although sessions like these can be and often are one of the elements in a strategic process, the actual creation of a strategy is multi-faceted. The critical question to be asked in this connection is whether the strategy is a result of an intentional, systematic, and rational action.

Researchers within the normative research tradition have great confidence in senior staff and their ability to base their strategic decisions on rational choices. If the reality and the environment of the organizations are understood as stable, then the specific strategic approaches bring compilation of data and description of this reality into focus. This makes it possible to develop strategies and strategic alternatives on the basis of the best possible description of the reality. According to these researchers, the construction of a strategy must be taken over by senior staff in the organization, as they are more experienced in identifying relevant strengths, weaknesses, opportunities, and threats.

Descriptive researchers, on the other hand, assume that there are limitations to such rational choices. These researchers are of the opinion that the organization's culture is an unexplored jungle of opportunities that can be understood merely through concrete actions and experiments. Thus the reality cannot only be observed, but can also be lived and understood through social interaction. In this manner strategy becomes a creative, social and action-oriented activity: "Strategy making has to be an active, dynamic process" (Mintzberg et al. 2005, p. 121), and "Strategy has to come out of a creative process conducted by thoughtful people" (Mintzberg et al. 2005, p. 5). As these quotations illustrate, we are dealing with an active, dynamic and creative process, in which the strategy develops through creative interaction among people.

The two different approaches to strategy leads to one of the most frequently discussed elements in the strategy literature; namely, whether the strategy is the outcome of a meticulously planned process, or if a strategy can be a pattern of consistent actions over time (McGee et al. 2005). In other words, the question remains: Does the strategy explain future actions, or does it evolve from previously undertaken, present individual and organizational actions? The answer varies depending on the person who is asked, as well as in which context the strategy will

be put into practice. Moreover, the answer will often be a combination of the two alternatives, as individuals or organizations in most cases rarely realize 100 % of their original objectives. On the other hand, the realized objective rarely differs greatly from the original objective (Mintzberg and McHugh 1985); i.e., the realized strategy is often a combination of planned and evolving actions. The literature on planning considers it possible that thinking precedes action, whereas the evolving understanding of strategy will argue that thinking and action are closely interconnected (Starbuck 1985). Weick (1987) adds that thinking will often strengthen action, as it will endow the action with meaning when it is seen in retrospect.

Thus, it is highly debatable whether the strategic processes are to be understood as a planned or evolving process. Keep these two possibilities in mind in the following overview of the various approaches to developing and implementing e-business strategy.

4 The State of e-Business Strategy

As previously mentioned, strategizing in relation to information systems and e-business remains a critical concern for both practitioners and academics (Philip 2007; Chen et al. 2010; Newkirk and Lederer 2006; Evans 2001; Cagliano et al. 2003; Birkhofer et al. 2000; Good and Schultz 2002; Lord 2000). The e-business strategic process has been greatly inspired by the literature and practices within the more "conventional strategic processes." Chaffey (2012) describes how e-business strategies have much in common with corporate, business, and marketing strategies; e.g., (1) strategy should be based on the current performance in the marketplace, (2) it defines how the company meets their objectives, and (3) it sets allocation of resources to meet goals. Even though e-business strategy and other types of strategies have much in common, there are areas where e-business strategies and the e-business strategic process are different from other types of strategies. First of all, digital technology enables new and innovative forms of value creation (Amit and Zott 2001); managers need to understand these new forms of value and incorporate them into the e-business strategic process. Secondly, related to the new forms of value creation, there is a great deal of learning and discovery associated with e-business strategy. Thirdly, Tassabehji (2003) mentions that disruptive technology threatens competitiveness and enables new forms of innovation. Companies and managers must also acknowledge that competition can come from new areas and that market dynamics can change as a result of e-business. Lastly, e-business will result in cannibalization, channel conflicts, and pricing issues, which must be considered in the strategy process of every organization. All in all, there seems to be a new "digital mindset" that successful managers need to adopt in order to develop an effective e-business strategy. The successful development and application of this digital mindset is the primary goal of e-business strategy.

As mentioned above, there are, both in conventional strategy and in e-business strategy, different processes and approaches towards creating strategies (Premkumar and King 1994; Sambamurthy et al. 1993; Earl 1993; Mintzberg et al. 1998; McKiernan, 1997). When dealing with e-business and information systems strategy, it is typical to categorize the different approaches along a continuum ranging from traditional planning to more incremental and adaptive approaches (Ivang et al. 2009; Newkirk and Lederer 2006; Earl 1993; Sabherwal and King 1995). This continuum reflects the above-mentioned distinction between normative and descriptive approaches to strategic processes. In Table 1, the two main approaches to e-business strategy, comprehensive and incremental, are briefly summarized.

The planning approach towards e-business strategy creation works best when the following conditions can be assumed: (1) members of organizations will make rational decisions that will provide maximum benefits to the organization; (2) stable conditions exist and structures can be identified; and (3) the future can be predicted accurately.

Predictability is the main argument for engaging in formal procedures involving data collection and analysis. The comprehensive strategic development process is formal and structured, based on written rules and procedures. It is based on a top-down planning strategy, and narrow participation profiles are present (Raghunathan and Raghunathan 1991; King 1978; Premkumar and King 1994; Raghunathan and King 1988). The process of strategy creation is conceptualized as a rational, comprehensive, and analytical task where the key outcome is a portfolio of e-business initiatives that will assist an organization in executing its business plans and realizing its business goals (Lederer and Sethi 1988). A large number of planning methods exist that define a linear, systematic approach to e-business strategy (Salmela and Spil 2002). Furthermore, the planners and implementers are typically detached.

In contrast to the comprehensive planning approach, the incremental approach is more dynamic, creative, and informal (Newkirk and Lederer 2006). The incremental approach assumes that the future cannot always be predicted, so organizational plans must be updated on a regular basis. Planning is, however, still

Table 1 Different approaches to e-business strategy

Characteristic	Comprehensive	Incremental
Analysis	Formal analysis	Informal analysis
Integration with business strategy	Plans are tightly integrated with business strategy	Plans are loosely integrated with business strategy
Review of plans	Plans are periodically reviewed to adapt to changed circumstances	Plans are continuously reviewed to adapt to changed circumstances
Representation and input	Plans are based on representation from many organizational groups	Plans are based on representation from a few individuals
Simplicity vs. complexity	Plans are complicated	Plans are simple

Source Salmela and Spil (2002)

possible and beneficial (Sambamurthy et al. 1994; Ciborra 1994). Therefore, the incremental approach is still conceptualized as an analytical process in which analysis comes before implementation. The planning is, however, smaller in scope and updated when needed. It focuses on only one or a few themes, with e-business decisions made on a case-by-case basis (Earl 1993).

The focused agenda keeps the planning team small and allows the use of personal experience and experimentation with new and innovative ideas, sometimes at relatively low levels in the organization (Ciborra 1994). Explicit planning methods are seen as having only a minor role. Consequently, the incremental approach does not provide similar explicitly systematic methods for e-business planning, as is the case under the planning approach.

The two above-mentioned approaches to e-business strategizing are well-developed and documented in the existing literature. However, there are also other alternative approaches that are currently under development. One of these approaches is referred to as the dynamic interaction-driven approach (Ivang et al. 2009). This approach acknowledges that the environment is always in a state of flux, and is thus not possible to predict. The resulting uncertainty indicates that environmental turbulence increases the risk of e-business investment failure (Salmela et al. 1996). Only through actions and the reflections derived therefrom will it be possible to understand and strategize in this ever-changing environment (Venkatraman 2000; Holmqvist and Pessi 2006; Newkirk and Lederer 2007).

The differences between the dynamic interaction-driven approach and the better-known planning and incremental approaches can be seen in Table 2.

As shown in Table 2, the dynamic interaction-driven approach to e-business strategy is a clear alternative to the incremental and planning approaches. The complete literature review to support the above table can be found in Ivang et al. (2009). As noted by Salmela and Spil (2002), there is a need for more research on the interaction and emergent approaches to developing e-business strategy. Fuglsang and Sundbo (2005) note that these types of approaches are not well-developed in the strategy management literature. Spil and Salmela (1999) went further, arguing for a dynamic theory of e-business strategy.

In the following section, the dynamic interaction-driven approach to conducting e-business strategizing is conceptualized.

5 The Rise of a Dynamic Interaction-based e-Business Approach

Earlier in this chapter, it was explained how the digital revolution had evolved and it was argued that the revolution currently was in the synergy phase calling for innovative approaches and trial and error processes. The goal of e-business is to create new understandings and engage in processes, which will result in the emergence of a new common sense. The synergy stage is a stage where a lot of

Table 2 Three approaches to e-business strategizing

Aspect	Approach	Indicators	Theoretical identification
Size of plan	Planning	Large, complicated and highly integrated with overall strategy	King (1978), Premkumar and King (1994), Raghunathan and King (1988)
	Incremental	Smaller and loosely integrated with overall strategy	Sambamurthy et al. (1994), Ciborra (1994)
	Interaction-driven	Actions, ideas, and prototypes substitute plans. Plan derives from action and reflection	Venkatraman (2000), Holmqvist and Pessi (2006)
Approach to analysis	Planning	Formal, multiple analyses are used as inputs to the planning process	Earl (1988), Raghunathan and Raghunathan (1991), Bergeron et al. (1991)
	Incremental	Personal experiences and judgment are used to derive plans	Sambamurthy et al. (1993) Vitale et al. (1986)
	Interaction-driven	Implementation is based on analysis. Reflection of actions in groups substitute data collection and analysis	Holmqvist and Pessi (2006), Bhandari et al. (2004)
Planning organization	Planning	Planning is based on formal representation by many different groups	Galliers (1987), Earl (1988)
	Incremental	Planning is based on an informal network of a few key individuals (often executives)	Pyburn (1983), Vitale et al. (1986), Earl (1993)
	Interaction-driven	Both network and hierarchy. The interplay of the two is essential	Bhandari et al. (2004)
Basis for decisions	Planning	Formal methods and criteria are the basis for decision	Ein-Dor and Segev (1978)
	Incremental	Shared group understanding of a few key individuals is the basis for decision	Sambamurthy et al. (1994), Ciborra (1994)
	Interaction-driven	The results derived from experiments and prototypes. Did the prototype result in the expected value?	Bondarouk (2006), Holmqvist and Pessi (2006)
Plan implementation and monitoring	Planning	Plans are periodically reviewed to adapt to changed circumstances	Galliers (1987)
	Incremental	Plans are continuously reviewed to adapt to changed circumstances	Earl (1993), Vitale et al. (1986), Sambamurthy et al. (1993)
	Interaction-driven	The result of sense-making creates the basis for the next step. Organizational members are at the same time enabled and constrained by others in the organization	Bondarouk (2006), Bhandari et al. (2004)

Source Adapted from Ivang et al. (2009)

experimentation has to be conducted, in order to locate where and how the technology can be utilized to generate competitive advantage. This means that the boundaries are unclear and stable structures, which can serve as bases for predictions, do not exist. Therefore, the strategic mindset of managers engaging in e-business strategizing must be open for innovation and the creation of the unknown.

In line with Weick et al. (2005) and Galliers (2007), the term "strategizing" is used to cover the complete process from envisioning to planning, taking action, and assessing outcomes. This means that the process of strategizing covers both strategy formulation and execution. Earl (1993) asserts that both quantitative and qualitative evidence suggests that the "organizational approach" is the most effective. According to Earl (1993), the organizational approach is based on organizational learning and the continuous interplay between formal and informal methods and behaviours in the organization. This means that e-business strategy is best performed when there is a continuous interplay between several organizational units, the hierarchy and the network.

In organizational settings, strategy and learning have a dualistic role to play in e-business management and practice. Strategy is a learning process where the stakeholders in the strategy process (the hierarchy and the network) are themselves the learning unit. In addition, this strategy is seen as being important for the direction of learning in organizational settings, and it is management's responsibility to direct and support individual and organizational learning (Dodgson 1993). After all, the success of strategy depends on its implementation. E-business strategizing is understood as a learning process that encompasses all levels of management and the informal network organization. Based on Kolb's learning theory (1984), the strategy process starts with taking action and the goal is to produce both single and double-loop learning (Argyris and Schön 1978). The interplay between the two constructs (the hierarchy and the network) can be seen in Fig. 2.

As can be seen in Fig. 2, there are three basic elements that constitute the dynamic interaction-driven approach to e-business strategizing: (1) the hierarchy, (2) the network, and (3) experience-based learning, a mechanism that facilitates

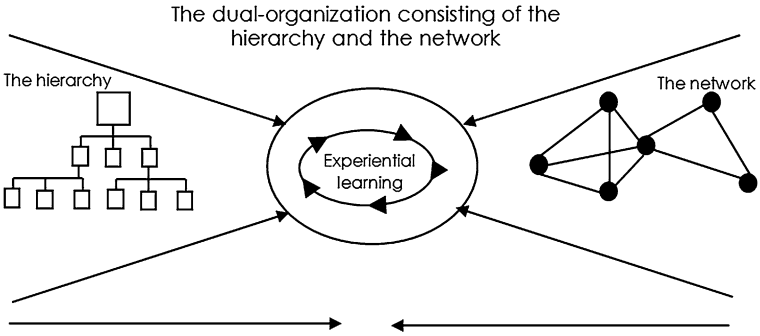

Fig. 2 Theoretical conceptualization of a dynamic interaction-driven approach to e-business strategizing

the development and implementation of the most effective e-business strategic initiatives. In the following three subsections, these three elements will be carefully explained and conceptualized in relation to e-business strategizing.

5.1 Experiential Learning as an e-Business Strategic Engine

The first element of the dynamic interaction-driven approach to e-business strategizing is the strategy process itself. Since earlier in this chapter strategy has been associated with learning, it is no surprise that organizational learning and more precisely organizational experiential learning is a key conceptual platform of the approach.

Research on experiential learning (Kegan 2005, Kolb 1984) is used to understand how the two organizational structures interact when formulating and executing e-business strategy. Experiential learning is utilized because learning and strategy have a dualistic role to play in e-business management (Auer and Reponen 1997). Moreover, several cases involving e-business pioneers demonstrate how e-business processes are constructed as learning processes, and not as rational planning processes. Hamel and Breen (2007) describe Google's use of a Darwinian process where organizational members using experiential learning are developing and implementing e-business strategy simultaneously. According to Hamel and Breen (2007), Google's success owes much to serendipity, and therefore Google's long-term strategy is not to innovate through top-down planning processes, but rather through trying to recreate the fertile innovation climate that is found within Silicon Valley itself. Google utilizes the value of trial-and-error processes, employing action and reflection to reach the future before its competitors do.

Kolb (1984) includes trial-and-error processes and learning through action when describing the concept of experiential learning. Kolb's theory is based on the idea that people have a natural capacity to learn, and that experiences act as catalysts for engaging in this process (Kayes 2002; Bondarouk 2006). Kolb views learning as being derived from experience and requiring an individual to resolve opposing demands (Kolb 1984).

According to Kolb (1984), learning involves the interplay between two interdependent dimensions of knowledge: acquisition and transformation. Knowledge acquisition demands the resolution of the tension between appre-hension (concrete experience) and comprehension (abstract conceptualization). Another dimension of knowledge is transformation, which reveals a dialectical tension between reflective observation and extension (active experimentation).

Kolb's original learning cycle includes four steps:

1. Doing
2. Reflecting
3. Thinking
4. Deciding

Kolb's cycle describes learning on the individual level; however, the theory has previously been used with success to understand learning on a group and team level (van der Heijden and Eden 1998; Kayes et al. 2005; Bondarouk 2006).

To accommodate the individual learning cycle within a collective organizational learning cycle, the model needs to be adjusted; the individual "doing-reflecting-thinking-deciding" cycle becomes a collective one, consisting of "collective acting-group reflecting-knowledge disseminating-sharing understanding-mutual adjustment." The process is shown below in Fig. 3.

The organizational learning process, as shown in Fig. 3, can start in different phases; however, in order to make the learning effective, the entire cycle must be completed (Bessant 2002). The organizational learning process is a cyclic and iterative one, where the two organizational components in close cooperation discuss and interact to understand the implications of e-business strategic decisions. The overall goal of the process is to enable the development of double-loop learning.

Double-loop learning involves the actors in the process learning not only how the technology is changing, but also what the consequences of their actions will be. The actors also learn the meaning behind the unconscious models they are using to understand their business, organization, and the market in which they are operating. In relation to developing e-business strategy, organizational members collaboratively engage in trial-and-error processes involving technology. The goal of these trial-and-error processes is to reach a common understanding in which e-business is utilized in the optimal manner at the strategic, tactical, and operational levels.

As is the case in Silicon Valley, the dynamic interaction-driven approach to e-business strategy starts with actions, and not with typical planning-oriented activities (Mentzas 1997). This is due to the increasing change and uncertainty (Miller and Friesen 1980, 1982, 1983, Salmela and Spil 2002), which makes it harder to predict the business environment in which e-business will be leveraged.

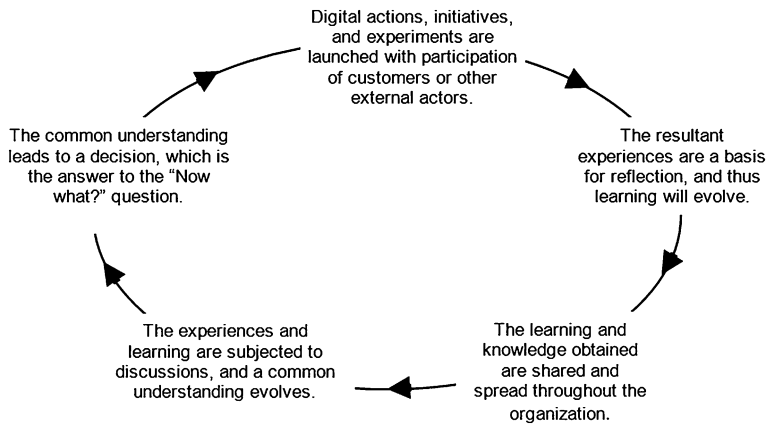

Fig. 3 The role of experiential learning in e-business strategy (*source* Ivang 2007)

Furthermore, IT changes rapidly, which makes it difficult to predict the IT and technologies that will become available during the planning horizon (Tanriverdi et al. 2010; Benamati and Lederer 2000). Weick (1987) argues that, under conditions of extreme ambiguity and uncertainty, the ability to act and carry out experiments is essential in order to be successful. It is the actions that lead to experience and knowledge, which ultimately diminishes the experienced uncertainty.

5.2 A Five-step Process of e-Business Strategizing

The five-step model of e-business strategy consists of the following five steps: (1) action, (2) reflection, (3) sharing of learning, (4) common understanding, and (5) decision. Often the process will start with actions, which can be initiated by internal or external demands. However, certain elements of the hierarchical organization can also decide to initiate some experiments with new or existing technology in new contexts. These actions consist of individual users interacting with a given technology, thereby creating valuable insights and experiences. This step resembles what Weick et al. (2005) call "starting with chaos." The chaos is exemplified by the current phase of the digital revolution and the fact that e-business and e-business strategy is an emerging phenomenon in many organizations. During the action step, individuals' everyday work situations are interrupted by a new technology. As a response to interruptions, users will start to reflect on their behaviors (Walsham 2005). The realized experiences provide a basis for reflection when the implementation team and the participants from the hierarchical organization—in collaboration with the external participants reflect on their experiences.

In other words, the action step is the phase during which organizational members are interacting with technology and creating the basis for the e-business strategy of tomorrow. As noted earlier, in the current phase of the digital revolution, the challenge is to develop a new common understanding in which the technology has found its optimal place. Starting with action instead of planning means that managers and employees form a project group with the purpose of trying out technology in a new customer case. Starting with action as the first step is an effective countermeasure against the common "go live" problem. Bondarouk (2006) explains that the "go live" problem is related to user dissatisfaction with the new system and is a missing link between existing processes and the new system. The dissatisfaction can also be related to excessive technological complexity or lack of support for the end user (Holmqvist and Pessi 2006).

Crucial learning is generated in the interplay between acting and experimenting with technology, and this reveals cues and data that would not be created in traditional planning approaches. This learning is critical in successful e-business strategizing. Actions are often launched as experiments where the outcome is unknown. Even if the experiment does not succeed, it will still produce learning and experience that can be used in successful experiments later. Therefore, it is

important that the right to act and fail is maintained. It is important to include end-user involvement in the e-business strategy process, since interacting with technology goes well beyond simply designing and building it. Using technology often reveals interesting elements that could not have been predicted in advance, and therefore would seldom be uncovered in a traditional planning process. In some projects, the greatest value of a specific technology turned out to be far afield from what was actually envisioned and planned by the implementation team (Ivang 2007).

The second phase is reflection. Action without reflection has limited value when the goal is to expand the existing business utilizing new business opportunities created by emerging technology. In most cases, action and reflection cannot be considered independently of one another. When interacting with technology, employees will often experience unforeseen results that spark reflection on actions; thereafter, the experiment can progress in new directions. Equally important, however, is the usual reflection of the team in meetings during an experiment and after it has been completed. In these meetings, the project team asks, "What happened? Why did this happen? Why did the experiment produce unforeseen results? Which elements were positive? Which elements were negative?" These questions give rise to common sense, and the results of the experiment advance from tacit to explicit knowledge. Bondarouk (2006) split the reflection phase into the following elements: discussing mistakes, describing and locating the experienced problems using the technology, and making comparisons with other IT implementations. The reflection phase is a process of abstraction from which a frame of reference and understanding will emerge. This frame of reference enables the individual actors to make sense of the actions and thereby convert individual learning into group-based learning. During the reflection phase, experiential knowledge is grouped and categorized so that the experiences of individuals are accessible for a larger group of organizational actors (Weick et al. 2005).

Following reflection, the third phase is to spread and share the obtained learning and knowledge in the organization. When the project group members have experimented with technology and reflected on their experiences, knowledge must be shared so that the experiences, both positive and negative, are disseminated throughout the organization. A negative experience with technology can represent nothing more than a mismatch between technology and a specific context. When sharing this experience, it could possibly trigger reflection by other organizational players leading to enhanced performance.

Coughlan et al. (2005) show how critical effective communication is between IT, sales and marketing, and the rest of the organization if the company is to realize the full value of its investments in digital technology. Most active knowledge dissemination takes place when organizational members spread information in reaction to various experiments. As the word spreads, it is typical for different departments in the organization to request a case description or other material in written form. It is important, however, that knowledge sharing is not reduced to compiling a report that the recipients have to read.

Knowledge has been found to spread most effectively by discussion at formal and informal events, demonstrations, and briefings. Both managers and employees of the organization are involved in this task of knowledge dissemination. This is the phase when, through conversations, experiences and learning come to life and create the basis for future action (Taylor and Van Every 2000).

The fourth phase consists of reaching a common understanding between the project group and the rest of the organization. This involves setting the different individual experiments into a collective context where new directions and possibilities might emerge; therefore, the common understanding should not be understood solely as an isolated event. Common understanding of a single experiment can, and often will be, a fixed meeting where the two organizational components meet and have discussions. It is important that these conversations and discussions are based in an open environment where there is a time and place to share contrasting experiences, and that they result in a common understanding of the experiment (Baker et al. 2005).

As Bondarouk (2006) notes, it is important during this phase to integrate the initial goals of the experiment with the experiences of the implementation team and end-users of the system. This discussion can lead to common understanding when the objective of the project was the right one, and the potential mistakes can be explained by a faulty process.

The last phase is the decision phase. Does the organization want to invest more in the project, or should it be shut down? This is when the organization must find an answer to the "Now what?" question. What implications do the acquired knowledge and experience have for the e-business strategic direction of the organization? This decision is reached in a complex interaction between the actors in the network and the hierarchy. Frequently, the decision of whether to invest further in the project or to end it is obvious and straightforward; however, if the results of the experiment also have implications for the overall e-business strategic direction, and organizational processes can be altered, the decision becomes more complex. Another factor that can complicate the final decision is the fact that, in order to scale, there may be a need for more resources to progress to a more durable technology.

Using Kolb's experimental learning cycle in an organizational setting, the exchange and spreading of experiences is an essential task, as these experiences can act as interruptions that initiate sense-making (Weick et al. 2005). The dissemination of knowledge can take place at many different formal and informal activities, such as conversations, meetings, presentations, and so on. It is in the decision phase that shared experiences create the basis for future actions (Taylor and Van Every 2000). Experiences and learning are subjected to discussion, and a common understanding evolves. The goal is not to agree on a single "correct" understanding, but to participate in an exchange of the different ways in which the digital technology can be used. Common understanding leads to a decision when the "Now what?" question is asked (Weick et al. 2005). Should the experiment continue, or should it be abandoned?

5.3 The Dual Organization as a Platform for e-Business Strategizing

The above-described, experience- and group-based e-business strategizing and learning process requires a platform to function. The process will not perform optimally if the hierarchy or the network alone is involved in the process. In other words, the process cannot be only a bottom-up or top-down process. The dynamic interaction-driven approach to e-business strategy builds on the theories of the dual organization and experience-based learning. According to Stacey (2003), thinking in dualistic terms has a "both… and" structure; one is mindful of both but locates them in different locations or times. When dual thinking is associated with the organization, the focal point becomes how to utilize both the formal and informal elements of the organization, and these elements are not viewed as counterproductive.

Organizational charts and job descriptions generally reflect the formal structure, or "prescribed" network, in a given organization. In contrast, the informal or "emergent" network refers to the often covert and unsanctioned informal relations that emerge over and above such prescribed patterns of interaction (Conway and Steward 2009). The two structures operate from different logics and perspectives (Gray and Starke 1984). To be successful, the e-business strategic process requires multiple views from different stakeholders (i.e., individual-level mental models) and their interaction to achieve shared mental models at the organizational level (Kim 1993).

The concept of the dual organization (Fuglsang and Sundbo 2005; Stacey 2003) can be used as a platform to understand how effective e-business strategy processes are orchestrated and supported in the organization. It is grounded in the principle that organizations comprise two different organizational components: (1) the hierarchy and (2) the interactive network organization.

This theory does not regard these two organizational elements as being competitive, but argues that these two elements can coexist effectively (Fuglsang and Sundbo 2005). When the dual organization is used as a platform, it becomes clear that the e-business strategizing process is based on many interactions within the organization. New ideas evolve out of interactions between the employees and the managers, and their interactions with external stakeholders and constituencies. This process is designed to balance both exploitation and exploration capabilities (March 1991, 1995; Sutcliffe et al. 2000). The roles of the hierarchy and the network organization are described below.

As Ivang (2007) notes, the hierarchy dictates changes in e-business strategy from the top, and is also involved in the implementation of the changes. In relation to e-business strategy, the role of the hierarchical organization can be described as follows:

1. *Formulate goals*: The first role of formulating goals and setting boundaries is a task for the hierarchy organization, which sets the frames in which the

innovative and creative processes could unfold. The hierarchical organization must guard the innovative processes associated with developing e-business strategy. This task is a key role for the hierarchical organization, as it is important for the employees in the network organization to have clear guidance, in order to build up self-confidence and gain the ability to act with power and force. Members from both the hierarchy and the network organization need goals to be sufficiently precise that they make sense and enable direct action; however, goals cannot be so rigid that the employees are locked into specific applications, technologies, etc. Eisenhardt and Sull (2001) identify five simple categories of rules that can guide the e-business strategic process: (1) How rules, (2) Border rules, (3) Priority rules, (4) Timing rules, and (5) End or Stop rules.

2. *Prioritize*: Here it must be understood that the e-business strategy is under constant development and refinement. Therefore, the strategy should not be regarded as a traditional one, to be captured in a document. The network organization presents results and projects for the hierarchical organization. The presentations facilitate the sharing of results among the different members. The presentations are, therefore, not focused entirely on getting new projects accepted or acquiring more resources. The main goal is to share and spread the knowledge generated by members' participation in different projects.
3. *Facilitate:* Facilitation is handled via individual members of the hierarchy who are assigned to different projects and work as closely together with this team as possible. Stacey (2003) notes the value of managers' firsthand experiences in gaining the optimal understanding of the new technology in relation to the company, markets, and customers. Providing management with the opportunity for firsthand experience is critical, as this enables the managers to understand the value of technology, facilitate the development of the organization, and provide common understanding. Managers with firsthand experiences carry what they have learned into their management networks; therefore, the impact of the dynamic interaction-based approach to e-business strategy is significantly enlarged.
4. *Protect the network*: In times of crisis, it is common for companies to cut expenses, and here the hierarchical organization plays a key role in protecting the network organization, ensuring that members can continue learning and making mistakes, in the process inventing the components of tomorrow's e-business strategy.

The network organization is composed of employees from marketing, sales, and IT. Often external players (e.g., customers) will also be involved in the process. Both the network organization and the hierarchy should be accepted as action-taking components; however, most of the actual work involving technology and optimization of systems is handled in the network organization. The main task of the network organization is to execute and experiment on a daily basis, thereby setting e-business strategy into motion. Thus, the primary role of the network is to

create the learning environment in which many different stakeholders interact and become engaged in the e-business strategizing process.

The positive coexistence of the hierarchy and the network demonstrates that effective e-business strategy processes are based on both formal and informal decision-making, and a process can be implemented in both directions, bottom-up and top-down. The fact that the organization is seen as a duality (i.e., a combination of two structures, the hierarchical, managerial one and a loosely coupled interactive one) creates the platform for understanding how e-business strategy is created in the interaction between the two structures.

As shown in Fig. 4, the process of developing and implementing digital solutions via the interaction-based approach is very different from similar innovation models such as the "innovation funnel" (Dooley and O'Sullivan 2000) and the second- and third-generation "stage-gate" (Cooper 1994), because the process focuses on actions and the resultant interaction. More traditional models employ data collection, analysis, formulation, and implementation.

The dynamic interaction-based approach to e-business strategy holds a variety of different implications for managers. Firstly, it is important that managers understand e-business as an evolving field where best practices are currently under development. For managers, this means that e-business strategizing has more in common with innovation than with planning. If the goal is clear and the environment is stable, it is easy for managers to develop a plan that will help them reach the goal. In relation to e-business, however, the goal for many organizations is not totally clear; before it can even determine the goal, the organization needs to embark on a journey where managers develop the strategy as they go along. In order to minimize mistakes, however, the e-business managers must create an

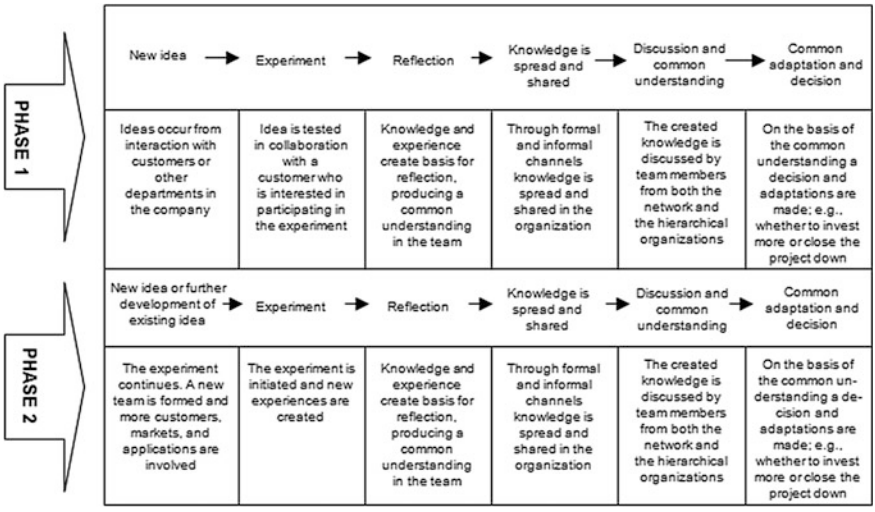

Fig. 4 Interaction-based e-business strategy framework (*source* Ivang et al. 2009)

environment where many different professional competencie interact in value-adding processes.

These different competences must go through trial-and-error processes to locate the areas where digital technology can be utilized to generate value for the organization. The goal is to create the future of the organization, a future in which the digital technology is a natural part of organizational life and the organization utilizes technology to gain competitive advantage.

6 Perspectives

This chapter is a step towards creating a dynamic interaction-based approach to e-business strategy. It describes the process and interaction between the different organizational components involved in e-business strategy.

The need for more dynamic e-business strategic approaches is based on the understanding of the synergy stage of the digital revolution. At the synergy stage, organizational members on different levels need to invent the future and develop a new common understanding of digital technologies. This calls for strategizing approaches that focus more on innovation than planning. Organizational members will often experience the strategy context as highly unpredictable and insecure. As uncertainty has become a way of life, and companies are finding it ever more difficult to predict changes in their environments (Luftman 1996), the e-business strategic process has to make use of more diversified strategic tools and processes. Simple addition of more tools into a planning or incremental process would not suffice here, since the method of strategizing is crucial.

A dynamic interaction-driven approach builds on interactions between key stakeholders that implement and use the technology, as interaction is a prerequisite for making sense of the ever-changing environment (Weick 1995), and therefore a prerequisite for formulating and executing e-business strategies.

The organizational context, the dual organization, and experience-based group learning act as the engine and create the context for setting these different tools into action. Together, the dual organization and experience-based group learning will improve the company's improvisational capabilities and IT-enabled agility. These dynamic capabilities emerge as a result of the interplay between complex organizational elements and stakeholders. Not all problems in e-business strategy can be solved with this alternative approach, but the ability to understand and explain e-business strategic processes in companies is enhanced with this alternative approach to e-business strategy.

The conceptualized alternative presented in this paper is a significant contribution to the literature because it will help researchers and practitioners understand the complex processes and learning cycles that take shape within companies that must develop e-business strategies.

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Value Creation and Value Capture Through Internet Business Models

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Abstract Firms compete in online markets through business models that have not yet been studied in sufficient detail. First, this chapter contributes to the literature on Internet business models through the study of the main mechanisms for creating and capturing value in electronic markets. The chapter describes how the main mechanisms of value creation on the Internet are aggregation, efficiency and customization. This chapter also discusses how companies can capture value in online markets by increasing the switching costs for consumers or leveraging network effects. Second, the chapter sets out four broad categories of business model based on specific mechanisms of value creation and value capture: Internet Malls, Content Providers, Merchants and Connectors. Finally, the chapter reflects on the dynamic nature of Internet business models and how most online companies tend to adopt hybrid business models which are continuously evolving.

Keywords Electronic markets · Network effects · Switching costs · Two-sided markets · Electronic commerce · Social network sites

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1 Introduction

The Internet has fundamentally changed the nature of doing business and competition in numerous industries. As new ways of developing and delivering products and services emerge on the Internet, competition goes beyond established modes of value creation and value appropriation. Internet-specific characteristics change traditional business models, and simultaneously give rise to new types of business models.

Internet business models have received increasing attention over the last decade driven partly by the need to explain how the Internet generates new business opportunities. Several key characteristics of the Internet allow the evolution of existing offline business models and the creation of new business models. The Internet is a technology that reduces communication costs. As a result, Internet may lower information search costs, increase the breadth and richness of information available to buyers and sellers, and reduce information asymmetries (Bakos 1997; Bakos 2001; Bakos and Brynjolfsson 2000; Grewal et al. 2003). Internet business models depend on this new information framework to benefit from new economies of scale and scope. Furthermore, reduced communication costs enable greater customization of products and services and the expansion and reconfiguration of the product range (Amit and Zott 2001).

The term "business model" is not a single distinct construct, but rather a concept that encompasses various aspects of an underlying phenomenon characterized by the dynamics of value creation and value capture. It is clear that Internet business models change and evolve continuously. Therefore, defining an ontology of Internet business models is a complicated task, since it may be quickly outdated. However, clarifying the fundamental mechanisms of Internet business models may shed new light on fundamental strategic management questions related to the complex environment in which Internet companies exist (Salas-Fumás 2009).

Business models have been studied from two different but complementary points of view (Hedman and Kalling 2003; Zott et al. 2011; Amit et al. 2012). The first research vector focuses on the description and the definition of the business model construct and provides business models' taxonomies or typologies (Timmers 1998; Tapscott at al. 2000; Amit and Zott 2001; Rappa 2004; Lumpkin and Dess 2004; Wirtz et al. 2010). Despite all these efforts, none of these definitions appears to have been widely accepted (Shafer et al. 2005). The second research vector identifies the different components of business models (Mahadevan 2000; Applegate 2001; Dubosson-Torbay et al. 2002; Hedman and Kalling 2003). The different components explained in these chapters can be aggregated under the two main components of a business model: value proposition and value appropriation.

The main goal of this chapter is to provide some theoretical perspectives on how these two basic components apply to Internet firms. In order to achieve this goal, this chapter describes specific Internet-based value creation and value appropriation mechanisms. It then goes on to synthesize these components into a taxonomy of pure Internet business models.

2 Value Proposition and Internet Business Models

The value proposition is the value created for users by the offering based on the technology (Chesbrough and Rosenbloom 2002). Different areas of research in management, such as entrepreneurship and strategic management, have been studying how Internet technology can create value. The way an Internet company creates value depends on the business model through which it carries out its strategy. This section examines the three key mechanisms of value creation in Internet business models: efficiency, aggregation and customization.

Efficiency refers to the value created by Internet business models streamlining transactions and enhancing operational performance. Internet business models enhance transactions' efficiency in a number of ways. First, Internet reduces buyers' search costs. The main value proposition of some Internet companies such as shopbots or online travel agencies is to provide buyers with comparative price information for different categories of products and services. In fact, despite some contradictory evidence on the impact of online price comparison on price levels and dispersion, recent studies suggest that users of online comparative price information may benefit from lower prices (Brynjolfsson et al. 2010; Tang et al. 2010). Second, some Internet business models create value for market participants by increasing trust. Under conditions of high trust, sellers and buyers will spend less time negotiating and writing a mutually acceptable agreement because they are confident that payoffs will be fairly divided (Dyer and Chu 2003). For instance, eBay provides a numerical reputation score for each user, which it calculates using information provided by transaction participants. Some Internet businesses provide these reputation scores to assess counterparty risk and adjust users' purchasing or selling behavior accordingly (Resnick et al. 2006; Bolton et al. 2004). Third, some Internet business models create value by enhancing the operational performance in terms of lower operational costs, lower communication costs, higher product and service quality, greater flexibility, and faster delivery in a myriad of industries (Boyer et al. 2002; Phan 2003; Barua et al. 2004; Devaraj et al. 2007; Hernando and Nieto 2007; Kwon et al. 2009). For example, in some industries such as music, video or newspapers with online delivery of information goods, users benefit from reduced delivery costs and times. Some firms adopted open business models which entailed sharing their operational infrastructure with other firms (Sandulli and Chesbrough 2009). Users can pay for the use of these operational resources on a short-term basis as needed. In this business model, users no longer have to make large investments to access costly operational resources and do not need to worry about overcapacity or undercapacity problems related to the planning and provisioning of these resources. For instance, Flickr provides photo management and storage resource, Dropbox, Google, Amazon.com and many others provide file storage and deliver their products as services over the Internet using Cloud Computing (Armbrust et al. 2010).

Aggregation is the second driver of value creation in Internet business models. Aggregation refers to the value created by assembling a large number of products,

users, buyers or sellers. Product aggregation occurs when an online seller provides a wide range of products. Barnes and Noble, which offers over 1 million book titles, is an example of product aggregation. The massive product range of online stores enhances consumer welfare (Brynjolfsson et al. 2011). Supply aggregation is especially suitable for products and services with low inventory costs or online distribution such as information goods. Mechanisms that lower search costs (Cachon et al. 2008), providing information about product popularity (Tucker and Zhang 2011), or systems based on interconnected product recommendations (Oestreicher-Singer and Sundarajan 2012) can enhance sellers' incentives to provide a large product selection. In the context of product aggregation, firms will need strong data management capabilities in order to optimize the product range. In addition, they need strong supply chain management capabilities to provide timely and reliable deliveries and to keep sourcing and inventory costs low. For instance, large product aggregators in information industries such as Spotify or Netflix experience high sourcing costs due to high copyright fees.

Some Internet business models bring demand and supply together. Supply and demand aggregation hinges on network effects: the value of a user of an Internet service increases with the number of users using this service. Internet firms fostering both supply and demand aggregation act as sponsors of two-sided markets because they facilitate interactions between end-users, and try to bring the two sides together by appropriately charging each side. Usually price structures established by Internet firms sponsoring two-sided markets are not neutral. Thus, the value created by these business models will accrue to buyers or sellers depending on how the market creates externalities on each side of the market and the nature of competition between rival market sponsors (Rochet and Tirole 2006). Like product aggregation, supply aggregation creates value for buyers. Buyers benefit from a wide range of products and on some occasions from fierce price competition (Haynes and Thompson 2008). Demand aggregation allows new market segments to be tapped, which are usually distinct from the offline target market (Ghose et al. 2006). For instance, Google or Facebook and firms with advertising-based revenue models allow advertisers to reach new audiences, which differ from the intended audience for their offline advertisements. In this context, demand aggregation benefits unknown sellers and the long tail phenomenon (Brynjolfsson et al. 2010; Edelman 2011). Furthermore, some new business models based on demand aggregation such as group buying businesses hinge on buyers' social interaction, where informed customers work as "sales agents" and bring less-informed customers into their social network (Jing and Xie 2011).

The third driver of online value creation is customization. Buyers' preferences are revealed through interactions between buyers and sellers. These interactions imply certain costs that will determine the efficiency of the creation and distribution of customized products and services. If interaction costs diminish, firms are able to design and deliver products and services that are more adapted to buyers' preferences. Internet technologies significantly reduce interaction costs and consequently facilitate the design of customized products and increase buyers' surplus (Dewan et al. 2003; Syam et al. 2005; Kamali and Loker 2006). Furthermore, Internet

technology allows the joint creation of value by the company and the customer (Prahalad and Ramaswamy 2004). By adding a new dynamic to the product-customer relationship by engaging customers directly in the production or distribution of value, co-creation let customers get involved at any stage of the value chain (Schultze et al. 2007). Co-creation based business models rely on multimedia-rich interaction opportunities offered by the Internet and the existence of online communities. Online co-creation initiatives increase online consumers' value perception not only by providing them with more "bespoke" products but also by empowering them through enriching the buying experience (Füller et al. 2009).

3 Value Capture and Internet Business Models

Capturing value from conjectured value creation activities is arguably the main objective of the firm (Teece 1986; Teece et al. 1997; Pitelis and Teece 2009). If the business model is unique or difficult to imitate, Internet firms should be able to capture some share of the created value and become profitable. On the other hand, if competitors can easily imitate the business model, customers will capture most of the benefits. Value capture implies transforming the created value into sustainable profits. In this section, we will discuss how Internet business models build on switching costs and network effects to create sustainable profits.

Switching costs can prevent the migration of customers and strategic partners to competitors and guarantee a sustainable stream of revenues. In the presence of business models based on switching costs, in initial stages firms will compete fiercely for market share before consumers have attached themselves to suppliers. Later, when their business has matured, firms' demand will be more inelastic, reducing rivalry (Klemperer 1987). As we discuss below, network effects also create this fierce competition in early stages. Moreover, macroeconomic conditions with low interest rates in the last decade increased the future value of market share and as a result incentivized price competition (Chevalier and Scharfstein 1996). This future value of market share explains why several Internet firms in early stages of competition do not charge or charge their customers a lower price instead of maximizing short-run profits, in order to raise its customer base and future profits. For example, most online newspapers started competing on advertising revenue models and offered free content, but have recently started charging for the use of their content.

The Internet literature has identified three kinds of switching costs. First, Internet firms may raise learning costs. Strong differentiation in terms of online customer experience may increase learning switching costs. It requires time and effort to learn how to navigate a website, which implies some switching costs when changing to another company (Smith et al. 1999). Consequently, firms may differentiate the browsing experience on their sites to prevent switching or copy the browsing experience of rivals' sites to lower learning switching costs and attract customers from their rivals. For example, the Spanish real estate online

marketplace Fotocasa copied the design and features of its main competitor, the market leader and first mover Idealista, and was able to capture a large market share from its rival. Second, Internet firms may raise contractual switching costs through loyalty programs and product bundling. Internet firms may employ loyalty programs to generate contractual switching costs in order to ease competitive pressure from rivals (Meyer-Waarden and Benavent 2006). However, although there is research that suggests that loyalty programs can improve online customer retention (Lewis 2004), other studies suggest that loyalty programs are efficient only under specific circumstances such as with customers with low initial levels of loyalty (Liu 2007) or in firms with strong complementary resources (Liu and Yang 2009). Contractual switching costs may increase because of product bundling in online markets. For example, the Internet reduces the costs of bundled distribution of information goods. For this category of products, bundling products may increase transactional switching costs and reduce competition. In these industries, bundling strategies can effectively bar the entry of new competitors with single product offerings (Bakos and Brynjolfsson 2000; Nalebuff 2004). First movers in Internet markets may also increase customer loyalty through product customization or exclusive content (Dewan et al. 2003). Regarding the level of customization, economic theory suggests that moderate levels of customization are more profitable than complete customization (Syam et al. 2005). Both customization and exclusive content imply high costs that could erode the Internet firm's profit. Mass customization requires complex flexible manufacturing infrastructure or labor-intensive processes that might be quite unprofitable if competitive dynamics prevent firms from passing on these higher costs to customers (Syam et al. 2005). On the other hand, exclusive content might be over-priced by content suppliers if more than one Internet firm compete for it (Armstrong 2006; Armstrong 2007).

Network effects arise when users demand compatibility with other users so that they can interact or use the same complements. Direct network effect arises if adoption by different users is complementary, while indirect network effect occurs when adoption by different users enhances the opportunities to trade with the other side of the market. A number of Internet businesses rely on new technologies to promote network effects. Internet technologies enable easy communication and connection between users, building up large networks, which intersect and overlap each other. Theory suggests that network effects create a competitive advantage for the firm with the largest customer network or installed base (Katz and Shapiro 1985). Furthermore, once a particular network gains a small lead over competing networks in terms of size, there is a tendency for the larger network to become the standard (Arthur 1996). How online users, especially in early stages, form expectations and coordinate their choices dramatically affects the performance of competition among networks. Therefore, as with competition through switching costs, Internet firms compete ex ante on network effects. The main goal for these strategies is to convince early adopters that network size will be large in the long run. Understanding how early adopters create expectations in Internet markets is of critical importance for companies seeking to ensure that their network is the first to reach the critical mass necessary to trigger tipping effects. Internet firms may

follow different strategies to convince pivotal early adopters. In particular, evidence suggests that Internet firms can foster network effects with penetration pricing, large investments in advertising and large bases of complementary products and services. Penetration pricing is effective in cases where early users adopt the product that offers the most surplus or the best combination price-utility. Advertising is more effective if early users adopt the product that offers better quality or lower prices. Furthermore, advertising can help boost expectations in situations where reputation and general market credibility can help communicate commitment. These higher returns from early marketing spending would explain the high levels of marketing spending in Internet first movers in most markets (Eisenmann 2006). Early adoption of an open business model (Sandulli and Chesbrough 2009) and integrating with suppliers of complements may increase both early adopters' and complement suppliers' expectations. Recent research suggests that not only network size but also network strength may have a significant impact on Internet firm sales (Shankar and Bayus 2002). Network strength measures the strength of the ties between network users. Internet firms such as Amazon.com or TaoBao actively tries to increase the strength of their online user community (Cova and Pace 2006; Füller and Hoppe 2008).

4 Internet Business Models Typology

Establishing categories for Internet business models is a challenging task for several reasons. First, the different mechanisms of value creation and appropriation can be combined in multiple ways. Second, Internet business models are not a static phenomenon since they continuously change and evolve. Consequently, there is still lack of consensus regarding Internet business models (Timmers 1998; Linder and Cantrell 2000; Tapscott et al. 2000; Rappa 2001; Gordjin et al. 2001; Osterwalder et al. 2005). Therefore, this chapter delineates four broad categories of Internet business models rather than establishing a detailed ontology of Internet business models. This approach highlights the main issues and elements firms have to consider, in order to operate successfully in the Internet era. This typology will provide a defined framework and a shared and common understanding of Internet based competition. The typology has four categories: Internet Malls, Content Providers, Connectors and Merchants. Internet Malls and Internet Merchants are transaction-based business models where buyers and sellers interact on the Internet. The difference between these two categories is that Internet Malls are two-sided markets (such as Amazon or eBay) where an intermediary aggregates buyers and sellers, while Internet Merchants are single sellers that sell their products and services on the Internet directly to the customer or using an Internet Mall. Because of the specific impact of the Internet on competition of information goods, we have created a specific business model category, Content Providers, which applies to firms providing free or paid information-based goods and services on the Internet. The fourth category is the Connector business model where

Internet users interact but without transactional goals. All four business model categories may have revenue models based on pay-per-use, subscription and advertising. In our view, revenue models do not create differences between business model categories, but rather, create differences within a category of business model. In this regard, analysis of Internet competition reveals that firms change revenue models more often than business models and that revenue models are more contingent and strategic than systemic. This approach will make our typology less time and cycle dependent (Table 1).

4.1 Internet Malls

Internet Malls aggregate many sellers under the same virtual roof. These firms mediate in the purchase-sale transactions for all types of items. There are several kinds of malls in different industries. To name a few, Amazon, eBay, TaoBao compete in retail markets; Alibaba, Worldoftrade or Asianet compete in wholesale markets; Expedia, Booking, eDreams or Airbnb compete in the travel industry. Comparing to the Merchant business model described below, Internet Malls are intermediaries and do not fix the prices of the products and services. Internet Malls support different price negotiation mechanisms such as auctions, fixed prices, requests for information, requests for quotes and requests for proposal, among others. The value proposition of Internet Malls relies on efficiency and aggregation mechanisms. Internet malls create value by connecting supply and demand. Compared to offline malls, online malls are more efficient since they usually lack physical space restrictions. Consequently, they can provide a large number of buyers and sellers with the resources needed to carrying out transactions. Internet Malls are characterized by the presence of two distinct sides which derive utility from interacting through a common platform. Therefore, Internet Malls can be considered two-sided markets, serving as platforms where owners or sponsors must manage network effects to bring both sides together. Internet Malls often treat one side as a profit center and the other as a loss leader. This implies that one of the sides, usually buyers, will obtain more value from operating through the Internet Mall (Lynch and Ariely 2000; Hagiu 2009). If buyers are not locked-in and participate in more than one Internet Mall, price structure will be more favorable for sellers, while the presence of buyers generating a high surplus for sellers will increase the value created for sellers in the platform (Rochet and Tirole 2003).

In addition to aggregation, Internet Malls should increase transactional efficiency and ensure smooth and mutually beneficial transactions between buyers and sellers while setting up trust mechanisms that establish trust between all involved parties. These businesses increase transactions' efficiency by providing consumers with search services that decrease search costs and establishing trust mechanisms that decrease risks related to opportunistic behavior. Internet Malls should provide sound transactional efficiency in order to attract and retain loyal buyers. In turn,

Table 1 Theoretical model

Value creation	Value appropriation	Revenue model	Business model	Examples
• Aggregation of supply and demand (Two-sided markets)	• Large user base • Complementarities • Active User communities	Pay-per-use	Internet Malls	• Amazon • Alibaba
• Efficient transactions	• Loyalty programs	Subscription Advertising		• eBay • TaoBao • Modalia • Zappos • Expedia • Booking • Tesco
• More efficient search, share and provision of content • Content adaptation	• Tailored content • Exclusive/differentiated Content • Long-term contractual relationships • Active user communities	Pay-per-use Subscription Advertising	Content providers	• Yelp • Google • Pinterest • Youtube • SpringerLink • Huffington Post • Spotify
More efficient communication between Internet users	• Large base of early adopters • Large base of early complementarities • Incompatibility	Pay-per-use Subscription Advertising	Connectors	• Facebook • Linkedin • Skype • Badoo • Evite • Twitter • RenRen

(continued)

Table 1 (continued)

Value creation	Value appropriation	Revenue model	Business model	Examples
• Efficient transactions	• Tailored products	Pay-per-use	Merchants	• Dropbox
• Customized products	• Rich Product information			
• Operational efficiency	• Focus on non-contractible aspects of the product bundle	Subscription		• Ingdirect
	• Strong brands	Advertising		• Zara

a large base of buyers will attract sellers, which is the side of the market where Internet Malls will capture most of the value. Internet Malls will capture value from the sellers by selling them transactional services ranging from simple catalog listings to inventory space or data management resources. The more the transactional services sold, the more the value captured by the Internet Mall. An important component of transactional efficiency in Internet markets is trust. Internet Malls need to provide trust mechanisms to ensure that buyers and sellers feel comfortable making their purchases. Failure to provide some of these mechanisms was one of the reasons for the bad performance of eBay in China. In contrast to Alipay, the online payment system of TaoBao, its main competitor in China, Paypal, eBay's online payment system did not incorporate an escrow system. Furthermore, unlike eBay, TaoBao enabled, through the instant messaging system Aliwangwang, real time communication between buyers and sellers before the confirmation of the transaction, which helped build trust. Finally, eBay provided poor customer service, especially when it came to resolving urgent problems. Using eBay entailed assuming a higher risk of opportunistic behavior, which seriously damaged firm's performance in China even though later on, the firm tried to solve this problem by incorporating new services such as escrow services for Paypal, Skype to facilitate real time communication between buyers and sellers, and a customer service phone number to solve urgent problems.

Being two-sided markets, indirect network effects are the main mechanism for value capture in this business model. The Internet Mall with the largest number of participants will have a sustainable competitive advantage in its market and the market will tend to create monopolistic power. An example of this trend is that Internet auction companies tend to gain monopolistic power in their geographic or vertical markets: eBay has achieved a near monopoly in the United States and some European countries, TaoBao in China, Yahoo! in Japan and MercadoLibre in Latin America. The relevance of network effects for this business model provides a substantial advantage to first movers such as Amazon or eBay in United States, or Yahoo! Auctions in Japan. However, followers such as TaoBao in China have demonstrated that the combination of a stronger value proposition and sponsored prices may deactivate early movers' advantage. In addition to indirect network effects, some Internet Malls may also increase switching costs by leveraging bonding social capital and taking advantage of direct network effects through the development of user communities (Chen et al. 2007). For instance, one of the differentiating features of the Chinese auction site TaoBao is the active online community of buyers.

Internet Malls also use complementarities to raise switching costs. Internet firms appropriate value from the complementarities between different products and services. For instance, Amazon, Alibaba, eBay, TaoBao and MercadoLibre have their own payment technology. TaoBao and eBay integrate communication technologies such as instant messaging or Voice Over Internet Protocol (VOIP) in their product portfolio. These complementarities create a strong lock-in effect. Internet Malls try to increase the complexity of their portfolio of complementary services to increase value capture. The evolution of TaoBao into Tmall is an example of

how this strategy allows higher value capture. In 2009 TaoBao launched Tmall, a retail oriented Internet Mall which charges higher fees to sellers in exchange for a more complete bundle of products and services. Internet Malls may also reinforce the lock-in effect by establishing loyalty programs or by customizing the transactional experience. For instance, eBay has established the PowerSeller Program where sellers with high sales volume receive certain benefits such as pricing discounts or prioritized customer support, and the MyeBay system allows buyers and sellers to customize virtually every aspect of their eBay transactions. Amazon also created customization features and established Amazon Prime, whose users get free two day shipping and access to instant streaming of movies and TV shows.

4.2 Content Providers

Content Providers are firms that provide large amounts of structured content. The firm, users or third parties can create this content. Some of the firms adopting this business model are online newspapers, online travel guides, online bulletin boards, search engines, academic journal providers, shopbots or content sharing sites. Content Providers distribute ubiquitous up-to-date content anytime any-where at a lower cost than offline content sellers do. Compared to traditional off-line business models, Content Providers create value through enhanced transactional efficiency and content customization. First, Internet reduces the distribution costs of digital content. Users of Content Providers may access and share content online at a fraction of the cost of offline content access and sharing (Kaiser and Kongsted 2012). Second, the fact that Content Providers can customize content is a very significant driver of value creation for them. These firms often seek to achieve a higher degree of content adaptation to users' preferences in order to attract them. For instance, content adaptation seems to be one of the main profit drivers for online newspapers (Pauwels and Dans 2001). For this reason, online newspapers such as the Wall Street Journal and the Huffington Post are starting a process of internationalization with adaptation to local content in order to combine local reach with global breadth. Often, the value proposition of Content providers is supported by co-creation and user content generation. Users create most if not all the content of large Content Providers such as Yelp, Youtube, Tripadvisor, SpringerLink, Google. Even some players in the online news industry are moving towards user-generated content. The success of Huffington Post lies in its ability to incentivize users to contribute content. This newspaper has developed a user recognition system (Huffington Badges) to generate an active user community where readers have incentives to create content in the form of comments and distribute it through social networks.

Regarding value capture, several Content Providers adopt customization features related to content management capabilities to increase customers' switching costs. For instance, The Wall Street Journal offers The Wall Street Professional

Edition service with customized content to professional readers, while Youtube recently enhanced its channel customization capabilities. These firms not only apply customization strategies to users, but also to advertisers. Content Providers try to raise switching costs for advertisers by offering customized marketing capabilities. These resources allow precise and performance-based pricing for advertising while reducing advertisers' price sensitivity and competitive pressure. For instance, Google's Adwords advertising campaign data is not compatible with competing advertising platforms (Bork and Sidak 2012). Furthermore, these firms may also raise switching costs by creating and defending incompatibility through exclusive content. This is a common strategy among copyrighted content providers such SpringerLink or Netflix. However, Content Providers also use content that is theoretically more open to create incompatibility. For instance, competitors criticize Google for restricting competing search engines from accessing Youtube or Google books content. In this fight for content, Yelp and Tripadvisor pulled their local and travel reviews from Google Places, forcing Google to buy Zagat and Frommer's to get access to this type of content. These businesses may also capture value by establishing contractual switching costs. In general, Content Providers prefer long-term contracts and subscription revenue models to pay-per-use or metered services revenue models since they will perform better in competitive settings (Fishburn and Odlyzko 1999; Balasubramanian et al. 2011).

Content Providers may also rely on network effects to capture value. Content Providers whose business model relies on user generated content will benefit from direct network effects. Recognition is a strong predictor of user-generated content (Leung 2009). A large online community implies a large potential audience for the content generated by users and a strong recognition effect. However, indirect network effects also have important implications in Content Providers' business models such as Search Engines. A larger base of content consumers will attract a higher number of content providers. The ability to raise a large base of users is especially important for those Content Providers with revenue models based on advertising. Attracting advertisers requires attracting users. Therefore, there is an obvious economic incentive for these Content Providers to provide users with superior content. When Content Providers increase user demand for its content, advertising on Content Providers becomes more valuable. Content Providers can therefore increase the demand for advertising by increasing the user base. A large user base will bring advertising investment to the Content Provider. However, if Content Providers cater too much to advertisers, they risk losing users. Although the firm may gain advertising revenue in the short run, in the long run, the subsequent decline in user demand would lower demand from advertisers, which would reduce ad revenues (Reisinger 2012). Once the base of loyal users reaches a relatively large size, Content Providers will often switch from advertising revenue models to mixed revenue models where advertising revenues are combined with subscription or pay-per-use revenue models. These mixed models allow user segmentation and in most cases are the best strategic choice (Prasad et al. 2003; Reisinger 2012). Most online newspapers have followed this strategy, moving from advertising to pay-per-use revenue models (Pew Research Center's Project

for Excellence in Journalism 2012). Huffington Post Media Group is an exception to this trend towards mixed models. This firm abandoned its subscription model for its magazine Huffington after just five weeks. The firm now follows an advertising revenue model and the magazine is now available for free from Apple's Newsstand. In this case, restricting access to content would damage their business model, because it would limit the potential number of users and the effects of direct network externalities.

4.3 Connectors

Firms that enable users to communicate with each other and to share content fall under the Connectors' business model. These firms offer search and communication tools and contact relationship management capabilities. This business model is adopted by general purpose social networking sites such as Facebook, Tuenti, Twitter, Renren, or Weibo, specific purpose social networking sites such as Linkedin, Evite, SportsBuddies, Badoo, Everyblock or Foodspotting, or VoIP applications such as Skype or GoogleVoice. The main value created by Connectors is the reduction of communication costs. In the past, individuals typically had to rely on geographically bounded communication and physical interactions. Long distance communication and interactions were costly. Users can now seek out a variety of communication tools and opportunities. Since the value proposition relies on enhanced communication, firms adopting this business model also tend to compete in mobile markets. There are some similarities between the Connector business model and the Content Providers' business model. For instance, Content Providers such as Flickr provide functionalities related to content and user communication, while for other Content Providers, such as Foursquare or Huffington Post, strategic partnerships with Connectors such as Facebook are critical to the business model. However, while Content Providers' value proposition relies on content related issues such as quality or amount, Connectors compete more in communication and interaction utilities. Because of these similarities, some companies shifted from one business model to the other. LiveJournal is evolving from Content Provider to the Connector Business Model. Though launched as a Content Provider business model based on user blogging, LiveJournal is trying to adopt a Connector business model to focus more on communication and relationship features such organizers or detailed metrics and statistics tools on user activity.

The economics of network effects and standard wars drive value capture in Connectors' business model. Firms following this business model try to create in-compatibility and impose their own standard. According to the classic literature on networks and platforms, firms adopting the Connector business model would need a large number of users and complementary products to win the competitive battle and to become the standard in the industry (Arthur 1996; Katz and Shapiro 1985). Firms seeking to base their business on this model may adopt two

strategies. First, Connectors have to focus on pivotal early adopters and must work on expectations. These firms may compete for early adopters through penetration pricing. At least in the early stages of most social networking sites, users do not have to pay any fee for using them. Later on, when firms considered their user base large enough, some social networks started charging for premium services. For instance, Linkedin, a social networking site for business people founded in December 2002, only started charging fees for some services in 2005 after reaching two million users. Similarly, Weibo, the largest microblogging site in China with more than 350 million users, started charging users of premium accounts in the mid of 2012, 3 years after its founding. A second strategy is to start early integration or to tie in with complement providers to increase early adopters' expectations of long-run network size. The race for complements adopted by some Connectors such as Facebook tries to bar entry and protect the core of their business, since this wide range of complements will force new entrants to also try and offer a wide range of functionalities to attract customers. For instance, according to SEC Filings as of March 31, 2012, Facebook integrated more than nine million apps and websites (SEC Filings 2012). Potential new entrants aiming at offering such a range of functionality need to close a large number of deals and partnerships, which entail large transaction costs. The main risk faced by firms following the Connectors business model is multi-homing, even for first movers or for firms following tying strategies (Choi 2010). Multi-homing occurs when customers belong to several different networks (Evans et al. 2006). To prevent multi-homing, incumbents create switching costs through technological incompatibility with potential entrants. For instance, in the segment of event-oriented social networks, competitors that entered the segment late, but with superior functionality such as Ping, Socializer or Facebook Event faced the problem that the first mover, Evite, created high switching costs by not allowing the migration of users' event history to rival networks (Mixergy 2010). Facebook followed a similar strategy when it forced its users to uninstall PageRage, a software application that allowed the customization of advertising on Facebook (see Sambreel holdings LLC; Yontoo LLC; and Theme Your World LLC vs Facebook Inc. 2012 in the US District Court, Southern District of California, 11/29/2012).

4.4 Merchants

Firms following the Merchants business model sell products and services on the web. Both pure Internet players such as Dropbox or Threadless or click and mortars such as Nike, Dell or Bank of America are examples of this business model. These firms can either decide to build the infrastructure needed to sell online or to outsource it and sell through Internet Malls. However, unlike Internet Malls, which are intermediaries and market makers, Merchants fix products' price. Price strategies in the online channels will depend on the capability of a low price to attract demand from rivals. In the case of brick and mortars, Merchants must

take into account the cannibalization effect of low price strategies if they sell their products through many distribution channels. As in offline markets, vendors propose different combinations of products and prices. Customers have to figure out which firm sells the product-price combination that most fits their needs. The main value proposition of the Merchants business model is associated with the reduction of transaction costs. First, customers will save travel costs, since they do not have to travel a physical distance because competing suppliers are just one click away from each other. Second, Internet reduces interaction costs between buyers and sellers, allowing for easier product customization. A growing number of firms following this business model implement customer decision support systems on their websites to configure product customization. For instance, sports footwear manufacturers like Nike, Adidas or Puma have implemented these customization systems. Third, online shops may focus on reducing the search costs for product-information. Online sellers may provide richer and more detailed product information including tools such as recommendation agents or customers' reviews. These capabilities will reduce customers search effort for product information and increase the quality of their consideration sets and their purchase decisions (Haubl and Trifts 2000; Dellarocas 2003). As a result, customers can make much better decisions while expending substantially less effort. Fourth, Merchants may create value through the reduction of inventory and transportation costs. Online distribution of digital goods, using low inventory fulfillment methods such as drop shipping or simply compressing the supply chain by reducing intermediaries may create substantial value in terms of easier deliveries and reduced distribution, inventory and transportation costs. These operational benefits might be especially significant in business-to-business transactions.

Economic theory suggests that horizontal differentiation in online markets will be difficult, because online buyers have better information on prices and product offerings (Brynjolfsson and Smith 2000). However, firms adopting the Merchant business model have demonstrated that they can use certain strategies to capture value in online markets. First, firms may charge higher prices for providing tailored products for customers whose ideal tastes lie within the capability of its flexible production resources (Dewan et al. 2003). These customized products allow the firm to extract a higher surplus from the customer. However, the successful implementation of this strategy requires that firms be able to charge a high enough price to cover customization costs. For example, Mattel no longer sells customized dolls on its Barbie.com site, although visitors can still mix and match hairstyles, clothing and eye color virtually. The reason this initiative failed was that the price of customized dolls was twice the price of standard products because each customized doll was made by hand. Due to the excessively high price of customized dolls, only 2 % of the users who used the customization feature at Barbie.com then bought dolls (New York Times 2011). These customization systems may also raise switching costs for customers, because sellers use them to learn about customer tastes. Second, providing richer product information can ease price pressures in Internet markets (Granados et al. 2012). This strategy will benefit suppliers with higher quality products. For instance, by providing more detailed product

information or customer reviews, Merchants will reduce information asymmetries and buyers can better discriminate between good and bad quality product suppliers. This strategy works in the hospitality industry where hotels with higher review scores can charge higher online prices than their competitors (Yacouel and Fleischer 2012). Third, customers may find one supplier more or less convenient depending on whether or not they feel confident about those non-contractible aspects of the product bundle like payment method, delivery time and the trustworthiness of redemption policies of goods and services (Smith and Brynjolfsson 2001). Fourth, when customers cannot find enough information to make a purchase decision, they depend on brand names as indicators of reliability for both product and service quality for non-contractible aspects. Therefore, Merchants should develop strong brands on the Internet to reduce the effect of price comparison (Danaher et al. 2003; Baye and Morgan 2009).

5 Implications of Internet Business Models

Over the last decade, Internet business models have attracted attention from managers. However, while it has become quite fashionable to discuss Internet business models, there is still much confusion and uncertainty about the business model term itself and the competitive differences between online and offline markets. While other authors have recently offered typologies of Internet business model, none of them appear to be generally accepted. To help managers better understand the range of Internet business models, this chapter identifies and classifies the basic categories of Internet business models. Internet business models are classified into four primary categories: Internet Malls, Content Providers, Connectors and Merchants.

A business model should reflect the firm's core strategy for creating and capturing value. Indeed, one of the major mistakes of the dot-com era was the excessive attention paid to value creation aspects and the neglect of value capture (Shafer et al. 2005). In many industries, the Internet allows the creation of value, but value capture mechanisms are still uncertain. Based on the review of value creation and value capture mechanisms discussed above and the business model typologies they fall under, it is possible to extract some conclusions.

In first place, the boundaries between Internet business model categories are fuzzy. This broad categorization was done on purpose to reflect the evolving nature of Internet business models. So far, the approach to the study of business models, including Internet business models, has been static (Demil and Lecocq 2010). However, in the last 20 years of Internet business models, one of the main differences between offline markets and online markets is that Internet firms evolved and adapted their business models much faster than offline firms. There are two explanations for the frequent changes to Internet business models: the relatively high number of entrepreneurial firms competing in Internet markets and the instability of Internet markets. As suggested by (Magretta 2002), we believe

that picking the right business model is a trial and error process. Business modelling will be more difficult in new or evolving industries and for newer firms. Entrepreneurial firms in unstable environments will be more likely to develop and use dynamic capabilities to detect and exploit new business opportunities, modifying their business models accordingly (Zahra et al. 2006). For instance, Google's first business model was the Merchants Business Model selling search applications to businesses and its own search technology to other search engines. In 2003, the company changed its business model and started competing with Content Providers, delivering different types of valuable content to Internet users. Then, the firm took advantage of its huge user base to explore new business models. In 2012, the firm finally defined the business model of Google Product Search, renaming it Google Shopping, which will compete as an Internet Mall. Meanwhile, with the integration of Google Plus, Google Mail and Google Phone it looks like the firm is also ready to seriously compete in the Connector Business Model. Facebook and RenRen are examples of Connector Business Model. However they moved into the Internet Mall business model by allowing economic transactions between users and application developers.

Google has not been the only firm to adopt different business models. For instance, Amazon started as a Merchant and then evolved into the Internet Mall business model. eBay was one of the first firms to adopt the Internet Mall business model, but now the firm is also competing with Skype in the Connector Business Model and eBay classifieds in the Content Provider business model. Apple's iTunes has been successful competing in the Content Provider business model, but its social network Ping (Social Network business model) met with failure and closed down in September 2012. Foursquare recently decided to refocus the business model from social networking to user-generated reviews, moving from a Connector business model to a Content Provider business model. However, in the future, the firm plans to compete as an Internet Mall by offering merchants' coupons or promotions, following Groupon's business model.

Why is there so much "business model encroachment" on the Internet? There are several explanations for these fuzzy boundaries in the Business model category and apparently low entry barriers. First, there are similarities between some of the business model categories described in this chapter. For instance, a critical requirement for the success of many Internet business models is scale. Value capture depends on accumulating a large user base quickly. The marginal cost per user of investing in a new product or service is lower for firms with a large user base. Consequently, Internet firms may take advantage of their large user base to enter new businesses. Firms with large user base will have stronger incentives to enter new complementary businesses than Internet firms with small user bases. Furthermore, it is easier for Internet firms to develop customer loyalty by offering a complete line of products. By increasing the product range, economies of scope arise on the demand side, which increases the cost of switching to alternative sellers with a narrower product range. Consequently, a broad range of complementary products and services is an additional pillar of successful Internet business

models. In fact, expanding into new Internet businesses firms may protect their core profit sources by raising switching costs.

The relevance of complements in Internet business models implies that successful Internet firms must develop the capabilities needed to build large networks of strategic alliances such as partner search and evaluation capabilities or an information-rich position within the value network (Dyer and Singh 1998). The importance of the size of the network of strategic partnerships for Internet firms (Chang 2004) contradicts the relational perspective, which holds that firms can increase profits by increasing their dependence on a smaller network of strategic alliances (Dyer and Singh 1998). Both Facebook and Google have large networks of strategic alliances. However, both firms show different levels of commitment and investments in specific relational assets depending on the partner. For instance, Facebook established tight relationships with some partners such as Zynga, the videogame provider. However, these alliances might turn into learning and user base races. For example, one of the reasons the 5 year exclusive agreement between Zynga and Facebook will be terminated prematurely in March 2013, is that Zynga was starting to compete from the inside with Facebook for users and advertisers. In fact, on the advertisers side Zynga started its own advertising platform, while on the users side Facebook started to block Zynga's aggressive viral marketing campaigns relying on continual Facebook feed-spamming to attract new users.

Entry timing decisions are also relevant for Internet business models and strategies. Early adopters and early complements may play a significant role in the success of Internet business models. The economic theory of network effects and switching costs suggests that first movers in Internet markets may have strong advantages. Firms may wait until market and technological uncertainties subside depending on their complementary assets and the threats posed by the specific network effects dynamics (Mitchell 1989). For instance, different industries offer different industry dynamics, which influence the relative strength of network effects and switching costs. In this sense, the literature shows that if customers' expectations are focused more on quality than surplus or price and first movers have not been able to raise significant switching costs, followers with superior quality could erode the position of first movers in online markets (Zhu and Iansiti 2011; Xu et al. 2011). For instance, TaoBao, Google or Facebook have been able to take over market leadership from eBay, Yahoo and Myspace. Furthermore, firms with strong complementary assets such as the large user base discussed above in the case of Internet firms or strong offline brands in the case of brick and mortar firms may develop successful Internet business models even if entering late in some online markets.

The third important decision when competing in Internet business models is managing product and service customization to raise customers' switching costs. As discussed above, product customization has major implications for both value creation and value capture. Product customization has some advantages but also a cost, which on occasion may be quite high and endanger the survival of the firm. It is critical that Internet firms define the optimum degree of product customization

for their business. The optimum threshold will depend on both the competitive dynamics and the investment needed to deliver customized products. On one hand, extreme customization is not always the optimum competitive strategy (Syam et al. 2005). On the other hand, optimum performance of product customization requires the combination of knowledge management, design and operational capabilities which are difficult to achieve but also difficult to imitate (Kotha 1996). In some business models, users contribute not only to the design of process but also to the production and distribution process. In these business models, Internet firms such as the Huffington Post or open software providers such as Hadoop or Drupal need to find the right combination of mechanisms to promote user involvement in the production (Von Hippel and Von Krogh 2003), distribution (Lee et al. 2010) and promotion process (Litvin et al. 2008).

6 Conclusions

As our chapter has shown, there is no single business model that defines several Internet firms. There are few Internet firms with a pure business model when it comes to create value or capture value in online markets. Most firms generating revenue from Internet business models are doing so via hybrid business models.

The reasons for this are pretty clear. It is difficult to compete on the Internet providing a narrow range of products and services, since even firms pursuing niche strategies struggle to prove they are providing enough value to persuade users to be loyal. Firms will often leverage complementary assets such as a large customer base or a strong brand to try to expand beyond the boundaries of a business model or a specific online market. The continuous evolution of the Internet business model phenomenon explains why the literature has not arrived at a consensus regarding a specific ontology. For this reason, this chapter has developed a typology of Internet business models based on very broad categories. From the perspective of companies that follow a pure Internet business model, firms that continue to simply focus on the obvious value drivers of Internet technologies such as operational efficiency are failing to enjoy the full benefits of the Internet based competition. While they may succeed in lowering operational costs, they do not necessarily benefit from network effects, the synergies of complementary assets or the strength of a community of loyal users.

In terms of value capture triggers, network effects and switching costs are dominant drivers in Internet markets. It is easy to understand why Internet firms believe a combination of both network effects and switching costs strategies can provide the best competitive weapons. Early user adoption and early development of complements can raise user expectations about future network size, and increase opportunities for firms to attract new potential customers. However, this chapter seeks to show that differentiated products and services still have the power to overcome these entry barriers in Internet markets. Meanwhile, cultivating a loyal user base requires firms to make strategic choices regarding the incentives needed

to promote user involvement and communities, how much product customization to allow, compatibility with competing products and services and forms of contractual switching costs such as product bundling or loyalty programs.

From a theoretical point of view, Internet business models open a large number of interesting research avenues. First, research on how the specific nature of customer expectations influences entry timing in Internet markets is still in its infancy. Second, the optimal government mechanisms managing the large networks of strategic alliances in Internet markets remain unclear. Third, further research is needed on the different degrees of customization and the incentives for users to co-distribute or co-promote products sold on the Internet. Fourth, the links between Internet business models and dynamic capabilities and valuable resources have not been fully explored yet (Daniel and Wilson 2003).

The major implication of our research for managers is that they have to be innovative about the choices they make when it comes to combining or redefining their existing business model components to increase value capture. The major implication for customers is that they need to make sure they are aware of strategies being used by Internet firms so they can understand and predict future firm behavior as firms encourage them to become or remain paying customers.

The line between the different categories of business models is becoming increasingly blurred to the extent that in many cases it is difficult to tell the difference between them. For the most part, firms that build revenue streams around Internet markets do not choose a specific category of business models in the long run; they choose business strategies that attempt to make the best use of the complementarities and synergies between different business models in order to maximize their opportunities for generating revenue and profit. In fact, firms relying on a combination of business model may obtain sustainable gains from business model innovations (Casadesus-Masanell and Zhu 2012).

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IT Competence-Enabled Business Performance and Competitive Advantage

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Abstract Firms increasingly invest in Information Technology (IT) to achieve competitiveness to address turbulent and dynamic environment conditions. After an exhaustive literature review, this chapter aims at developing a framework to identify and analyze the relationships between a set of IT assets and IT capabilities, firm performance and the achievement of a sustainable competitive advantage. The findings suggest that IT investment by itself is unable to sustain a long-term competitive advantage, making it necessary to analyze the presence of resources that complement IT infrastructure to achieve better organizational performance. We thus stress the importance of studying the complementarity of IT resources in this relationship. This means that assessing both physical and managerial IT resources and other organizational resources in studying the relationship between IT and firm performance may provide better justification for IT spends.

Keywords Information technology · IT business value · IT asets · IT capabilities · Resource-based view

1 Introduction

In the last two decades, there has been growing research and practical interest in the role of Information Technology (IT) in business performance. A wide variety of studies have been performed to determine whether the efforts firms have made

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to develop IT can sustain long-term competitive advantage (e.g., Mata et al. 1995; Brynjolfsson and Hitt 1996; Ross et al. 1996; Powell and Dent-Micallef 1997; Bharadwaj 2000; Santhanaman and Hartono 2003; Dehning and Stratopoulos 2003; Ray et al. 2005). Some of these studies conclude that the results the firm obtains through IT implementation establish, at least in part, the foundations that support improvement of the firm's competitive position. There is still no consensus, however, on the strategic value of IT (Oh and Pinsonneault 2007; Kohli and Grover 2008).

Navas (1994) defines IT as the materialization of all knowledge related to the treatment of information that will enable the creation of an information system (IS) distinctive to each organization. Powell and Dent-Micallef (1997) define it as a set of devices and solutions constituted by hardware, software, and communications networks.

According to Melville et al. (2004, p. 287), the IT business value is defined as "the organizational performance impacts of information technology at both the intermediate process level and the organization-wide level, comprising both efficiency and competitive impacts." IT business value research is thus defined as any theoretical or empirical study that examines the impact of IT on organizational performance.

The dominant research paradigm on this topic is the resource-based view (RBV) (Bharadwaj 2000; Tanriverdi 2006; Pérez-Aróstegui et al. 2012). According to the RBV, the foundation of competitive advantage between firms is composed of organizational resources based on their strategic potential (Peteraf 1993; Barney 1991). Barney (1991) defines strategic potential as the ability of a resource to implement and develop strategies that increase the firm's efficacy and efficiency. To achieve this potential, the resource should fulfill the attributes of value, rarity, inimitability and non-substitutability. The literature review shows that IT assets do not fulfill these four characteristics (Wade and Hulland 2004), meaning that they are incapable of sustaining a competitive advantage in the long term (Mata et al. 1995). However, other studies have demonstrated the existence of IT capabilities that are firm-specific and cannot be transferred easily. These are generally termed IT competence (Tippins and Sohi 2003; Pérez-Aróstegui et al. 2012), IT relatedness (Tanriverdi 2005), or IT-enabled resources (Nevo and Wade 2010).

This chapter performs a literature review of the different studies on IT. The goal is to analyze the relationship between IT and sustaining a competitive advantage or improving performance, thereby creating a theoretical framework to ground subsequent analyses. Next, the methodology used to do such review is presented. The third section then reviews the existing literature on IT and the RBV, while also discussing whether IT is a valuable resource capable of sustaining a competitive advantage. The adoption of the RBV as a paradigm implies that IT in itself is unable to sustain a competitive advantage, making it necessary to analyze the presence of resources that complement it to achieve better organizational performance. We thus stress the importance of studying the complementarity of resources when analyzing the relationship between IT and firm performance. The fourth section provides a review and analysis of the main assets and capabilities of

IT—i.e., those both inherent in and complementary to IT—defining the different dimensions of a competence in IT, as well as its effect on organizational performance and sustaining a competitive advantage. Finally, we provide the main conclusions of the qualitative analysis of the literature review, as well as some significant managerial implications.

2 Methodology

Evaluation of the prior literature is a key stage in structuring a research area (Easterby-Smith et al. 2000), since it establishes a foundation on which to advance theory, closes off obsolete lines of research, and reveals new areas that require more in-depth research (Webster and Watson 2002). We have used a qualitative methodology to evaluate the current state of research on IT business value. This methodology has been used successfully in studies with similar goals in management fields, such as those by Wade and Hulland (2004) and Melville et al. (2004).

As recommended by Webster and Watson (2002) and Levy and Ellis (2006), we have followed a systematic process to review the literature in a structured and effective way: to choose, get to know, understand, apply, analyze, synthesize, and evaluate the prior literature. To achieve this goal, the initial literature review followed a process of identifying articles from searches in the main databases: *Business Source Premier* (*EbscoHost*), *ABI Inform Global (ProQuest Direct)*, and *Inderscience*. *ScienceDirect (Elsevier), Wiley Online Library (Wiley), Emerald Insight, Scopus, Springer Link*, and *ISI Web of Knowledge.*

In this process, we excluded books and book chapters, working papers and conference presentations in order to guarantee maximum rigor. We determined the most important journals using Journal Citation Reports (JCR) as a reference, since JCR is a rigorous, objective database that uses a systematic method for determining the relative importance of journals in an area of knowledge. Thus, the main journals chosen are:

> MIS Quarterly, Journal of Strategic Information Systems, Information & Management, Strategic Management Journal, Journal of Management Information System, Information Systems Research, Journal of Computer Information Systems, Industrial Management & Data Systems, Journal of Operations Management, European Journal of Operational Research, International Journal of Production Economics, International Journal of Operations and Production Management, and International Journal of Production Research.

We also established a timeframe determined in the searches for articles in the databases. Since the first studies that used the term "Information technology" date from the 1990s, we set the starting point of the search as 1990 and extended it to the present.

The keywords used in the search process were: Information Technology (IT), Information Management, Information Systems, IT business value, IT resources,

IT competence, IT capabilities, Management of Information Systems, Resource-based view and IT-enabled resources. As this search yielded hundreds of articles, we performed a selection process to ensure the main contribution of the article to the area of study. We ultimately chose 96 articles for in-depth evaluation.

3 Information Technology under a Resource-Based View Approach

3.1 Starting Reflections

First studies that attempt to analyze the impact of IT on firm strategy present positive results, focusing on case studies in which IT obtained spectacular success (SABRE reserve systems, American Airlines; see Buday 1986). According to the findings on the existence of this strong relationship between the two variables, companies should integrate this technology into their firm strategy.

In the 1980s, however, various studies showed the absence of productivity derived from significant investments made in IT; this has come to be known as the *productivity paradox* (Brynjolfsson 1993; Brynjolfsson and Hitt 1996, 1998; Lucas 1999); growth in productivity had stagnated or even declined just when the growth in IT was increasing and firms' investments in IT reached increasingly significant figures. These studies' conclusions have been questioned, however, based on certain theoretical and methodological arguments (Freeman 1991; Lindbeck 1991; Dos Santos et al. 1993; Lucas 1993; Mooney et al. 1995; Hitt and Brynjolfsson 1996):

- Inadequate use of measures of the IT intensity and the difficulties that arose in statistical measurement of productivity.
- Failure to include or control adequately for other factors or variables that influence the firm's profitability, e.g., measuring IT intangible improvements, such as the capability to respond quickly to the customer or other intangible values that existing measures of productivity could not calculate.
- Problems related to sample selection and size.
- The IT impact is slight if its application is not accompanied by changes in the firm's organization.
- A fundamental component for the successful IT implementation in the firm, the human component, has been severely neglected as compared to technical components (hardware and software).
- IT has been introduced in isolation, in "automation islands," without the appropriate integration of systems or the crucial training of employees (i.e., abilities in design, application, and maintenance).
- The IT benefits are not immediately visible or completely capturable by the firm, since introducing them is often seen as a cost.

In addition to the recent empirical studies that questioned the strategic importance of limiting analysis to the IT adoption, the growth of the RBV (Penrose 1959;

Wernerfelt 1984; Prahalad and Hamel 1990; Grant 1991; Barney 1986, 1991; Peteraf 1993) as a potent integrative research paradigm in this field weakened some of the results in the existing literature. Thus, while researchers have traditionally focused on seeking advantages derived from industry or competitive position, the RBV seeks advantages that are the result of specific and intangible firm resources, such as organizational culture or learning. The result of the recent research on IT is the notion that these technologies in themselves do not generate sustainable competitive advantages.

One of the groundbreaking studies in this less optimistic current of research is that by Clemons and Row (1991), who propose the *strategic necessity hypothesis*. In general, this hypothesis has two propositions:

1. IT achieve an increase in the efficiency of internal and external operations by granting firms greater value, such that organizations that do not adopt these technologies will have higher costs and will be at a competitive disadvantage.
2. The IT implementation will not necessarily grant the firm sustainable competitive advantage, since the technology will be available on market for other firms.

Thus, RBV provides solid theoretical foundations for investigating the context and conditions under which IT can provide a sustainable competitive advantage. Specifically, RBV constitutes a highly persuasive framework for evaluating the strategic value of IT resources, providing an orientation to how to distinguish between different types of IS and how to study their influences on performance (Santhanam and Hartono 2003).

Wade and Hulland (2004) establish the utility of using this paradigm in research in IS management, arguing the following:

- It facilitates the specification of IS resources, providing the basis for an exclusive and exhaustive set of IS assets and capabilities.
- It permits comparison between IS resources and firm's resources; that is, RBV promotes transversal research through comparison with other organizational resources.
- It provides the mechanisms needed to study the relationship between IT and the achievement of competitive advantage, since it provides an effective way to measure the strategic value of IS resources.

Thus, RBV provides a robust framework for analyzing whether IT can be associated with the achieving better competitive position (Barney 1991; Clemons 1986; 1991; Clemons and Kimbrough 1986; Clemons and Row 1987, 1991; Feeny 1988; Feeny and Ives 1990; Mata et al. 1995), sustaining a competitive advantage, and calculating empirically the complementarities that can exist between IT and other organizational resources (Powell and Dent-Micallef 1997). Many studies that attempt to analyze the impact of IT on organizational performance ground their propositions in this theory (Bharadwaj 2000; Santhaman and Hartono 2003; Tanriverdi 2006; Pérez-Aróstegui et al. 2012).

Resources are all organizational assets, attributes, knowledge, and processes controlled by the organization on which the firm strategy rests (Barney 1991). For them to be a source of competitive advantage, however, there must be collaboration and coordination between them (Grant 1991). This first definition of resources is very broad, including both assets and capabilities indistinctly. Therefore, other authors (e.g., Grant 1996) distinguish between the resources or assets of an organization and those capabilities, abilities, or competences that enable the firm to develop its competitive strategy from the combination of these assets. This terminological problem is one of the main criticisms of this paradigm.

There is no single classification or typology of the firm's resources. Based on Barney (1991), resources can be classified into three categories: physical resources, human resources, and organizational resources. Physical resources include technology and equipment, physical plant, geographical location, and degree of accessibility of raw materials. Human resources are composed of experience and relationships between workers, managers, and the other personnel in the firm. Finally, organizational resources encompass the firm's organizational structure, the different systems for planning, control, etc., and the different informal relationships within the firm and between the firm and its environment.

Grant (1995), in contrast, distinguishes between human, tangible, and intangible assets, although the most generally accepted classification distinguishes between tangible and intangible assets (Hall 1992). Tangible assets include financial and physical resources, whereas intangible assets are composed of human and technological resources and reputation. In contrast to tangible assets, intangible assets are difficult to identify and imitate and thus have greater competitive potential.

On the other hand, Dierickx and Cool (1989) and Amit and Schoemaker (1993), among others, differentiate the static from the dynamic aspect of resources. Resources constitute the static aspect and include the stock of productive factors that the firm possesses or controls. Different types can be thus distinguished—e.g., financial, physical, human, organizational, or technological (see Grant 1992), among which we should stress information-based resources (intangible), since these are resources with high potential for sustaining competitive advantages (Itami 1987). On the other hand, capabilities involve flow; that is, they represent the dynamic aspect, as they are what define the way the firm uses its resources (Amit and Schoemaker 1993). Further, given their dynamic character, they cannot be considered independently of their use (Penrose 1959).

In sum, capabilities refer to the specific abilities and knowledge that the firm possesses to develop its resources using a series of organizational processes. A capability can be understood as a routine or set of routines (Grant 1991; Fernández Rodríguez 1993). Nelson and Winter (1982) define capabilities as combinations of different resources that emerge as the fruit of organizational routines.[1] Thus, firms that lack routines lack basic capabilities, since the firm's capabilities are

[1] The term *organizational routine* refers to the repetition of a series of regular patterns that are the result of a sequence of coordinated actions (Nelson and Winter 1982).

understood as an external manifestation of its routines (Collis and Montgomery 1995). Capabilities are important because they represent the main determiner of competitive advantage (Grant 1991).

Next sections identify a set of attributes that guarantee the sustainability of a competitive advantage based on IT, and analyze the complementarity between IT resources and other organizational resources.

3.2 IT and the Achievement of a Competitive Advantage

RBV determines that the foundation of competitiveness lies in the firm's capability to combine a set of resources. Specifically, Grant (1996) establishes that competitive advantage is sustained by the integration of assets and capabilities and that organizational routines are what permit this combination. Barney (1991) proposes that the resource should be scarce, valuable, inimitable, and nonsubstitutable. It should be valuable for firm strategy, difficult for competing firms to imitate, and not susceptible to easy substitution by other resources. It is thus necessary to propose two basic assumptions of RBV (Mata el al. 1995):

1. Resource heterogeneity: Each firm possesses a specific stock of resources, which are the fruit of its history and past experience, based on which it can obtain competitive advantage.
2. Resource immobility: Competitive advantage will be sustainable as long as other firms have cost disadvantages in developing, acquiring and using key technology compared to the firm that already possesses it.

Other typologies have been proposed by Grant (1991), Amit and Schoemaker (1993), Black and Boal (1994)[2], and Collis and Montgomery (1995), among others. Table 1 provides a summary of these typologies.

In general terms, resources must be valuable (Dierickx and Cool 1989; Barney 1991), rare (Williamson Williamson 1979[3]; Barney 1991), inimitable (Barney 1991; Amit and Schoemaker 1993), non-substitutable (Dierickx and Cool 1989; Barney 1991; Amit and Schoemaker 1993; Collis and Montgomery 1995), imperfectly mobile (Dierickx and Cool 1989; Barney 1991; Amit and Schoemaker 1993), and capable of generating future rents that can be appropriated by the firm (Dierickx and Cool 1989; Barney 1991; Grant 1991; Peteraf 1993).

A resource is valuable when it permits the organization to improve its efficiency and effectiveness through the implementation of strategies (Barney 1991). For a resource to become a source of competitive advantage, however, it must not be available simultaneously to a large number of firms (Amit and Schoemaker 1993).

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[2] Black and Boal (1994) propose as attributes of the resources nonsubstitutability and limited commercializability.

[3] Williamson (1979) refers to idiosyncratic assets.

Table 1 Main attributes of resources according to the RBV

Dierickx and Cool (1989)	Barney (1991)	Grant (1991)	Amit and Schoemaker (1993)	Peteraf (1993)	Collis and Montgomery (1995)
Valuable	Valuable	Durability	Scarcity	Heterogeneity	Appropriability
	Scarce	Appropriability	Appropriability	Imperfect mobility	
Causal ambiguity	In-imitable (historical dependency, causal ambiguity, social complexity)	Imperfectly mobile: geographic immobility, imperfect information, specific resources, immobile capabilities	Inimitable	Ex-post limits to competition: inimitable and nonsubstitutable	Inimitable
Limited substitutability	Non-substitutable		Limited substitutability	Ex-ante limits to competition	Non-substitutable
Non-commercializable		No replicability	Non-commercializable		

A resource can be appropriated based on its capability or potential to generate rents that can be appropriated by the firm (Grant 1991; Amit and Schoemaker 1993; Collis and Montgomery 1995). Thus the advantage created by a valuable and rare resource (or combination of resources) will not provide the greatest benefit if the firm is not able to take advantage of the rents generated from the competitive advantage. Hidding (2001) demonstrates that, after the firm obtains a superior position and rents, there must be forces that limit the competition for those rents. Thus, resources must not only be inimitable, non-substitutable, and imperfectly mobile. Mata et al. (1995) argues that the advantage from new developments in the characteristics of computer hardware, for example, has a short life, since competitors will be able to duplicate this technology rapidly.

Barney (1991) proposes the following attributes as determiners of low imitability:

- The role of history, since some resources require a long period of time to develop.
- Causal ambiguity, since competitive advantage rests on tacit knowledge and combination of different complementary resources. This ambiguity can reside in not knowing how a resource is the leading force in a sustainable competitive advantage, or in the absence of knowledge that this resource or combination of resources directs the sustainable competitive advantage. This ambiguity makes it extremely difficult to imitate the resource or the way in which it is employed (Lippman and Rumelt 1982; Barney 1986, 1991; Dierickx and Cool 1989; Reed and DeFillipe 1990).
- Social complexity, since competitive position is the result of other firm attributes, such as organizational culture, reputation, etc.

Next, a resource will be nonsubstitutable if there are no equivalent resources that are in turn rare and inimitable (Amit and Schoemaker 1993; Black and Boal 1994; Collis and Montgomery 1995).

Finally, imperfect mobility is a key attribute for sustaining a competitive advantage (Dierickx and Cool 1989; Barney 1991; Amit and Schoemaker 1993). A resource will be immobile if it is not commercializable (Peteraf 1993). Some IT resources, such as software and hardware components, are relatively easy to acquire on the factors market, whereas different abilities or skills as well as management experience will not be available on the various markets.

Mata et al. (1995) design a model to analyze the impact of heterogeneity and immobility of the resource on competitive advantage. The model revolves around a set of questions about the attributes of the firm's resources and capabilities. That an asset or capability is valuable is a necessary but not a sufficient condition to achieve a competitive advantage, although firms that possess non-valuable resources will be in a position of competitive disadvantage derived from the use of these resources. If a resource is valuable and heterogeneously distributed among competitor firms, it can come to achieve a temporary competitive advantage, whereas its homogeneous distribution among the different firms will lead to a

situation of competitive parity. The attribute that determines the sustainable character of a resource-based competitive advantage is imperfect mobility, however, since firms that do not have this resource have great difficulty acquiring, developing, and implementing it in the organization's strategy.

In contrast, Wade and Hulland (2004) use the terminology from the model developed by Peteraf (1993) to explain how the firm's resources and capabilities generate a competitive advantage. To do this, they identify six attributes, classified under two conditions: *ex-ante* limits to competition (the resources must be rare and valuable, and the rents they generate must be appropriable) and *ex-post* limits to competition (the resources must be inimitable, non-substitutable, and imperfectly mobile). If a resource is imitated, its availability on the factors market is highly probable, diminishing its rarity. Resources that enjoy high mobility can also be acquired by competitor firms, again affecting the attribute of "rarity." Substitutability affects the value of the resource more than its rarity, however. Resources do not become less rare because they have multiple substitutes, although one expects that their value will diminish as substitutes are developed.

In general terms, all IT resources are valuable (Mata et al. 1995; Ross et al. 1996; Bharadwaj 2000), but some assets and capabilities—e.g., IT managerial abilities, the degree of integration of the IT strategy in the firm strategy, or experience in using and applying IT—tend to be more valuable or rarer and less imitable and substitutable than other assets, such as IT infrastructure or technological property. Thus, some strategic resources are capable of generating a future rent that can be appropriated by the firm. The fact that resources are heterogeneous and have perfect immobility explains the differences in firms' organizational performance. However, heterogeneity and perfect immobility are necessary but not sufficient conditions for competitive advantage to be sustainable over time. Rumelt (1984) establishes a series of conditions that strategic assets must fulfill to achieve a lasting competitive position. These conditions are called *isolation mechanisms*: causal ambiguity, time compression diseconomies, and first-mover advantages. As mentioned above, *causal ambiguity* can emerge in two ways: first, the firm's resources are the result of a process of accumulation of resources embedded in organizational routines (Nelson and Winter 1982) and complex interactions that make it difficult for competitor firms to identify the resources; second, competitive advantage can depend on the complementarities existing between the different resources.

Time compression diseconomies refer to specific resources and capabilities that are the fruit of the firm's trajectory and have been accumulated over time and developed through experience and learning (Dierickx and Cool 1989), constituting an obstacle to imitation.

Finally, *first-mover advantages* imply that firms that pioneer in acquiring the resources that sustain competitive advantage obtain a series of advantages derived from the effect of accumulated experience and learning, or from the existence of externalities (Dierickx and Cool 1989[4]).

[4] Dierickx and Cool (1989) classify first-mover advantages under the term "mass efficiencies".

In IT, the ability to obtain information on markets or customers can improve firms' predisposition to adapt to changes in the environment and thus to improve their competitive position relative to competitors who are poorly informed and slower to adapt (Barney 2001). Among the IT resources analyzed by Mata et al. (1995), therefore, only managerial abilities associated with IT can sustain a competitive advantage. This kind of ability, which takes concrete form in many cases in relationships with other agents, is the fruit of the evolution of the firm's activity and of many decisions taken over time, as well as the experience accumulated, such that the degree of complexity is very high. Dehning and Stratopoulos (2003) verify this result. Wade and Hulland (2004) determine that only IT resources that are inimitable, non-substitutable, and imperfectly mobile can affect a competitive position in the long term. Likewise, within IT resources, capabilities that anticipate market demands (capability to act quickly, IT flexible infrastructure) and that involve external and internal analysis (IT planning, IT integration in firm strategy, etc.) have a greater impact on the sustainability of competitive advantage.

3.3 IT Complementarity

Based on the analysis in the foregoing section, IT can be a source of competitive advantage, but we must consider the existence of another factors that act as necessary complements to obtaining and maintaining better performance (Clemons and Row 1991; Bharadwaj 2000; Ravichandran and Lertwongsatien 2002; Teo and Ranganathan 2003).

The preceding literature review has shown the existence of studies that find a negative or weak relationship between IT and organizational performance (Warner 1987; Weill 1992; Brynjolfsson 1993; Barua et al. 1995) or find that there is no such relationship (Sager 1988; Venkatraman and Zaheer 1990). On the other hand, there is theoretical and empirical evidence to indicate that the implementation of IT permits firms' to improve their competitive position directly (among others, Mata et al. 1995; Brynjolfsson and Hitt 1996; Silverman 1999; Bharadwaj 2000), although more of the studies analyzed find a contingent relationship between IT and organizational performance (among others, Powell and Dent-Micallef 1997, Li and Ye 1999; Tippins and Sohi; Caldeira and Ward 2003: Teo and Ranganathan 2003; Tanriverdi 2005, 2006; Pavlou and El Sawy 2006; Oh and Pinsonneault 2007; Nevo and Wade 2010; Pérez-Aróstegui et al. 2012).

There is thus no clear understanding of the processes by which IT impacts firm strategy and improvement in performance (Devaraj and Kholi 2003; Lee et al. 2008).

From the perspective of the RBV, complementarity represents an increase in the value of a resource, since it occurs when this resource produces greater benefits in the presence of another resource than when that resource is used alone. A complementary interaction of resources generally increases their value, although the

causality can be ambiguous (Barney 1991). Teece (1986) understands complementarity as the sense of how one resource can influence another and as how the relationship between resources affects competitive position or organizational performance.

Benjamin and Levinson (1993) determine that the effects of IT on performance depend on the integration of organizational, business, and technological resources. Keen (1993) classifies IT assets and capabilities into human, business, and technological resources and determines, within the RBV, that the success of IT implementation lies in the capability for integrating IT with existing human and business resources to achieve an advantage based on specific attributes of the firm.

Powell and Dent-Micallef (1997) point out that competitive advantage will depend on the exploitation of relationships between the different complementary organizational resources. Jarvenpaa and Leidner (1998) indicate that IT can generate a competitive advantage only if it is complemented by a set of preexisting human and business resources in the organization.

Bharadwaj (2000) focuses on studying the intangible organizational resources related to IT that permit the firm to influence and develop intangible resources such as customer orientation and firm synergy through the co-presence and complementarity of these resources. Bharadwaj thus proposes three intangible resources: orientation to the customer, knowledge assets, and synergy (which involves sharing resources and capabilities between different divisions in the firm).

Tanriverdi (2005, 2006) studies the super-additive synergies of value generated by the complementarity of IT resources with other organizational resources in the different divisions of the firm.

Thus, resources and capabilities directly related to IT should be complemented by another kind of assets and capabilities, generally business or human resources, to improve the firm's competitive position. The nature of IT resources, and the process by which these interact with other organizational resources, has received very little study (Ravichandran and Lertwongsatien 2002; Wade and Hulland 2004), and more in-depth analysis is needed (Kohli and Grover 2008). Very recent theoretical studies advocate the role of IT assets as facilitators of other organizational resources under the name of IT-enabled resources (Nevo and Wade 2010).

4 Analysis of the Resources Used in Studying the Relationship Between IT and Organizational Performance

4.1 Classification of IT Resources

The idea of developing a classification that enables us to identify clearly the assets and capabilities inherent in and complementary to IT when studying the effects of this technology on organizational performance emerges from the controversies in

the literature, since previous studies often use abstract classifications or include capabilities that are considered assets and vice versa (Ravichandran and Lertwongsatien 2002).

First, IT assets include all intangible elements that make up the IT infrastructure: hardware and software (Powell and Dent-Micallef 1997; Bharadwaj 2000; Teo and Ranganathan 2003; Ray et al. 2005). They also include all business applications that use this infrastructure (Melville et al. 2004), such as computer purchasing systems, sales analysis tools, e-mail, internet, intranet, etc. Ross et al. (1996) and Weill et al. (1996) argue that IT infrastructure includes computers and other computer applications, as well as shareable databases and technical platforms. Byrd and Turner (2000) give the following components: hardware and operating systems, communication networks, shared critical information, and main data processing applications. Ray et al. (2005) use the concept of "generic information technologies" to refer to the software and hardware components that can be acquired on factors markets. These IT dimensions are used in most of the studies analyzed.[5]

IT infrastructure has also been evaluated from a dynamic point of view. Since empirical evidence has shown that this variable alone does not contribute to sustaining a competitive advantage (e.g., Dehning and Stratopoulos 2003), we do not use it as a measure but instead analyze the existence of a flexible IT infrastructure. Flexibility is shown in the firm's capability to standardize the components of its IT infrastructure (Ray et al. 2005). In this way, flexible IT infrastructure enables the organization to find technical solutions more quickly and effectively (Ravichandran and Lertwongsatien 2005), since it permits easy integration of new technologies into existing platforms.

Other authors include under IT assets a series of dimensions that go beyond the mere physical infrastructure that sustains an information system. For these authors, IT assets also include IT department support personnel (Tippins and Sohi 2003) and personnel in other departments (top management, other workers), as well as the presence of training programs or teaching of specialized IT skills (Ross et al. 1996; Powell and Dent-Micallef 1997; Feeny and Willcocks 1998; Bharadwaj 2000; Tanriverdi 2006).

Another dimension for evaluating IT assets has been represented in the quantity of financial resources that the firm assigns to the IT department; also, in the possibility of accessing the capital necessary to implement an IT innovation (Mata et al. 1995; Li and Ye 1999; Caldeira and Ward 2003; Ray et al. 2005), since access to capital and the amount of capital devoted to IT management and innovation can affect the firm's competitive position. Ray et al. (2005) affirm that IT investment has almost become a necessity in industry (their statement is restricted to the insurance and life insurance industry in North America). Other authors use

[5] Among others, Feeny and Willcocks (1998), Armstrong and Sambamurthy (1999), Broadbent et al. (1999a, b), Bharadwaj (2000), Feeny (2001), Pemberton et al. (2001), Ross and Beath (2002), Weill et al. (2002), Dehning and Stratopoulos (2003), Sambamurthy et al. (2003), Sher and Lee (2004), Melville et al. (2004), Tanriverdi (2005, 2006).

as a measure of the IT assets the existence of IT-related technology that the firm possesses; i.e., that is legally protected through patents, copyright, and other kinds of figures (Mata et al. 1995; Ross et al. 1996).

Finally, many authors have shown the benefits that certain organizational factors can have for IT assets (Melville et al. 2004), such as: organizational structure, the firm's policies, workers' practices, corporate culture, etc. Successful application of IT is usually accompanied by a series of significant organizational changes (Brynjolfsson and Hitt 2000; Brynjolfsson et al. 2002; Cooper et al. 2000). Thus, relationships with other agents (suppliers and customers) have a positive influence on the development of IT assets (Benjamin and Levinson 1993; Powell and Dent-Micallef 1997; Bharadwaj et al. 1999; Tanriverdi 2005, 2006). Obtaining and maintaining a relationship of trust with suppliers and customers that is viable from the financial point of view using sophisticated interorganizational IT requires tacit and complex coordination, as well as some communicative abilities that competing firms usually find very difficult to imitate (Hall 1993).

Flexible organizational structures also facilitate the application of new IT developments (Powell and Dent-Micallef 1997; Ray et al. 2005). Besides, the existence of a culture favorable to innovation in IT encourage a context that favors the development of those assets (Bharadwaj 2000), one that provides changes and experimentation and minimizes fear of failing (Powell and Dent-Micallef 1997).

Table 2 provides a summary of the main classifications of IT assets from the most significant authors.

Following the framework developed by Teo and Ranganathan (2003), IT capabilities can be classified under two large constructs: human resource capabilities related to IT and business capabilities related to IT.

Human resource capabilities related to IT include the abilities and knowledge, both technical and managerial, of human resources related to IT. These capabilities involve not only current technological knowledge but also the ability to develop, use, and manage this knowledge (Wade and Hulland 2004). The specific capabilities are (See Appendix 1): *level of learning* (Benjamin and Levinson 1993; Bhatt and Grover 2005), IT *technical abilities* (particularly Mata et al. 1995; Ross et al. 1996, Feeny and Willcocks 1998; Bharadwaj 2000; Caldeira and Ward 2003; Dehning and Stratopoulos 2003; Teo and Ranganathan 2003; Melville et al. 2004; Wade and Hulland 2004; Ray et al. 2005; Tanriverdi 2005, 2006), IT *managerial abilities* (among others, Li and Ye 1999; Caldeira and Ward 2003, Dehning and Stratopoulos 2003; Teo and Ranganathan 2003; Melville et al. 2004; Wade and Hulland 2004; Tanriverdi 2005, 2006), *managerial commitment to IT* (e.g., Powell and Dent-Micallef 1997; Byrd and Davidson 2003; Caldeira and Ward 2003; Sher and Lee 2004; Ray et al. 2005), and *IT leadership* (Feeny and Willcocks 1998; Jarvanpaa and Leidner 1998).

IT technical capabilities take concrete form in the skills that IT employees possess related to the development of applications, integration of systems, and the maintenance of current systems (Melville et al. 2004); knowledge of programming languages; experience in operating systems and understanding communication protocols (Mata et al. 1995); development of business software applications;

Table 2 Main IT-related assets

Authors	IT-related assets			
	IT infrastructure	IT investments	IT staff	IT legal property
Benjamin and Levinson (1993)	Hardware and software infrastructure			
Mata et al. (1995)		Access to capital		Technological property
Ross et al. (1996)	IT infrastructure		IT staff, IT training	Property of IT projects
Powell and Dent-Micallef (1997)			Training of IT personnel	
Jarvanpaa and Leidner (1998)	IT infrastructure (networks)			
Feeny and Willcocks (1998)	Design of an IT architecture		IT staff	
Bharadwaj et al. (1999)	IT infrastructure			
Li and Ye (1999)		IT expenditure		
Bharadwaj (2000)	IT infrastructure		IT staff, IT managers, IT training, IT know-how	
Ravichandran and Lertwongsatien (2005)	Flexible IT infrastructure			
Byrd and Davidson (2003)			IT department	
Caldeira and Ward (2003)		IT investments		
Dehning and Stratopoulos (2003)	IT infrastructure			
Teo and Ranganathan (2003)	IT technology and applications		IT training	
Tippins and Sohi (2003)	IT objects (infrastructure)			
Melville et al. (2004)	IT infrastructure and applications			
Sher and Lee (2004)	IT infrastructure			
Wade and Hulland (2004)	IS infrastructure			
Piccoli and Ives (2005)	IT infrastructure, information deposits			

(continued)

Table 2 (continued)

Authors	IT-related assets			
	IT infrastructure	IT investments	IT staff	IT legal property
Ray et al. (2005)	Generic IT	IT investments		
Tanriverdi (2006)	IT infrastructure		IT training	
Crawford et al. (2011)	IT infrastructure			
Pérez-Aróstegui et al. (2012)	Flexible IT infrastructure			

efficiency in communication services (Byrd and Davidson 2003); and experience related to database design (Ray et al. 2005). Some authors also include the existence of IT training programs in this dimension (Teo and Ranganathan 2003), classifying them as IT-related assets (Powell and Dent-Micallef 1997).

On the other hand, IT managerial capabilities include the ability of managers to identify and plan appropriate projects, to order the right resources, to lead and motivate the development of teams for the implementation of projects, and to collaborate with other business units (Byrd and Davidson 2003: Melville et al. 2004). For Mata et al. (1995), this capability includes managers' abilities to conceive, develop, and implement IT applications to support and improve other business functions.

As to managerial commitment to IT, according to Henderson and Venkatraman (1993), the success of IT implementation requires a top manager who acts as "business visionary," supporting and articulating clearly the need for IT. Kettinger et al. (1994) determine that the support of the CEO is crucial to IT success, since it enables resources to be available for implementing and integrating IT into business strategy, and ensures continuity of IT investments over time.

Organizational capabilities related to IT include organizational abilities and knowledge that facilitate the development of IT-related assets. Among these, we emphasize the following:

- The capability to redesign business processes based on IT (among others, Benjamin and Levinson 1993; Powell and Dent-Micallef 1997; Bharadwaj 2000; Teo and Ranganathan 2003; Melville et al.; 2004). Through such redesign, the state of alignment could lead to a variety of firm-specific capabilities and practices, better evaluation of current structure and processes, anticipation of IT needs, and an authentic ordering of the structures and processes as a result of the introduction of new IT.
- IT integration into firm strategy (among others, Benjamin and Levinson 1993; Ross et al. 1996; Powell and Dent-Micallef 1997; Feeny and Willcocks 1998; Tanriverdi 2005, 2006). Previous literature studied recognizes the capability of constructing and maintaining relationships within the firm between IT function and other areas or departments. Powell and Dent-Micallef (1997) define it as the capability to integrate IT planning into the firm's strategic planning goals, strategies, and processes.
- IT planning (Ross et al. 1996; Feeny and Willcocks 1998; Byrd and Davidson 2003; Teo and Ranganathan 2003; Wade and Hulland 2004). Includes the ability to anticipate future changes, choose the right platforms for these changes (Ross et al. 1996; Feeny and Willcocks 1998), and direct the resulting technological change as well as its growth effectively (Bharadwaj et al. 1999).
- *Benchmarking* (Powell and Dent-Micallef 1997). Although it has been argued to be an essential element for developing competitive IT systems (Boar 1994), benchmarking stresses the systematic observation and replication of competitive resources rather than the design of firm-specific applications. Bharadwaj (2000) establishes that benchmarking can play a significant role in improving organizational capabilities, since firms can identify activities and functions that need

improvement and analyze the companies that are leaders in management of these systems.

- The ability to manage relationships with IT-related agents (Powell and Dent-Micallef 1997; Feeny and Willcocks 1998; Bharadwaj et al. 1999; Bharadwaj 2000; Tanriverdi 2006), such as suppliers or customers. These relationships are crucial, for example, to expanding electronic data interchange technologies rapidly (EDI).
- The capability to develop and take advantage of synergies among the different IT assets and among these resources and other assets in other areas of the business (Sher and Lee 2004; Tanriverdi 2006).
- The presence of open communication and organizational consensus (Powell and Dent-Micallef 1997). This requires a culture of trust and a minimum of formalization and bureaucracy of processes, etc.

4.2 Determination of a Competence in Information Technology

Bharadwaj (2000, p. 171) defines IT capability as the ability to mobilize and deploy IT-based resources in combination or co-present with other resources and capabilities in the firm. For Tippins and Sohi (2003, p. 748), an IT competence represents the degree to which a firm possesses knowledge of its IT and uses this IT effectively to manage the information that the firm generates; that is, the different dimensions of the construct "IT competence"—composed of IT managerial knowledge, IT infrastructure, and IT operations—represent co-specialized resources that show the organization's ability to understand and use IT tools and processes necessary to manage the information from customers and the market. Likewise, Bharadwaj et al. (2002, p. 4) redefine IT capability as the firm's ability to acquire, develop, and direct its IT resources to determine and support its business strategies and value chain activities.

IT capability has thus been defined as a complex, multidimensional construct, and the literature proposes various specific resources whose combination can enable the firm to compose a capability or competence in IT. The different dimensions suggested can be classified into three groups, as can be deduced from the literature review performed in the previous section: one group refers to IT infrastructure present in the firm, another to the degree of development of the different business resources inherent in and complementing IT, and the third to IT technical and managerial knowledge (Pérez-Aróstegui et al. 2012).

4.3 Impact of an Information Technology Competence on Firm Performance

Much of the literature presents IT competence from a perspective of its complementarity with other organizational resources; that is, there is a series of

organizational constructs that mediate the relationship between IT and performance. The most noteworthy mediating variables are the following: managerial practices in the supply chain (Byrd and Davidson 2003); knowledge management and organizational learning (Tippins and Sohi 2003; Sher and Lee 2004; Tanriverdi 2005); turbulence, munificence, and complexity of the environment (Wade and Hulland 2004; Pavlou and El Sawy 2006); manufacturing practices (Banker et al. 2006); core competences (Ravichandran and Lertwongsatien 2005); quality management (Pérez-Aróstegui et al. 2012); and firm culture (Benitez-Amado et al. 2010). We now analyze the impact of IT-related assets and capabilities proposed in the literature review on performance and/or the obtaining of a sustainable competitive advantage.

Mata et al. (1995) analyze the effects of five IT resources on competitive advantage: the cost of capturing customers, access to capital, technology property, IT technical capabilities, and IT managerial capabilities. Using an approach based on the RBV, they propose that only IT managerial capacities are capable of sustaining a competitive advantage over time. These abilities take concrete form in understanding and appreciation the needs in other areas of business and of agents, in the ability to work with other agents in developing IT applications, in the capability of coordinating IT-related activities, and in the willingness to anticipate the firm's technological needs.

Powell and Dent-Micallef (1997) confirm empirically the *strategic necessity hypothesis* (Clemons and Row 1991) and determine that, since IT is relatively easy to acquire in competitive factors markets, some firms will be able to obtain competitive gains from this technology through the complementarity of intangible human and business resources such as the integration of IT with firm strategic planning, the existence of a flexible culture, or relationships with suppliers. They only find empirical support, however, for human resources. Ravichandran and Lertwongsatien (2002) examine complementarity from the RBV, finding support for the relationship between IT capabilities and capabilities that are not inherent in this technology as the basis for achieving greater firm performance.

Bharadwaj (2000) demonstrates that IT infrastructure should provide a platform to stimulate new IT applications sooner than competing firms; and that IT human resources should permit the rapid implementation of these IT applications, such that there must be a series of intangible capabilities able to direct the exploitation of these resources in the firm, e.g., a mentality of orientation to customers and the ability to identify and take advantage of the synergies derived from the complementarity of resources. Their study finds, however, a series of statistical inconsistencies between IT and organizational performance, due to incomplete knowledge of the nature of the firm's resources and abilities and poor measurement of IT. Santhaman and Hartono (2003) start from the model presented by Bharadwaj (2000) and verify it empirically through new measurement of the variables.

Dehning and Stratopoulos (2003) establish that IT managerial capabilities are positively related to the sustainability of long-term competitive position, while this relationship is negative for the case of the abilities and knowledge possessed by

competing firms. Their study does not find statistical support, however, for IT physical capabilities and IT infrastructure as sources of sustainable competitive advantage.

Wade and Hulland (2004) establish that those capabilities that anticipate market demand (capability to act rapidly, existence of IT flexible infrastructure) and those that involve external and internal analysis (IT planning, IT integration into firm strategy, etc.) will have a greater impact on the sustainability of competitive capability.

In their study, Ray et al. (2005) determine that firm-specific resources with a high degree of social complexity, such as the knowledge shared between the IT area and the customer service units, affect organizational performance positively. Thus, improvement in performance based on IT is founded on those assets and capabilities that are developed specifically within the firm and on effective relationships between IT and managers in other business areas. IT spending or IT technical capabilities are not sufficient to achieve superior performance.

Tanriverdi (2006) finds that firms whose business units operate in different industries have an opportunity to exploit the IT synergies generated transversally by applying IT resources and management processes through different units. This study suggests that by using IT-related resources and, subsequently, by creating cross-unit business synergies, an IT-related coordination mechanism could be developed and, as a result, enhance organizational capabilities.

Gharajedaghi (2006) stresses the concept of synergy, which indicates that the impact of IT-enabled resources is not merely the sum of its components. One must consider the relationships among these components.

It follows from the literature review that IT *physical assets* (IT infrastructure) do not influence better organizational performance, since the different software applications, as well as the different physical components, can be acquired easily on the factors markets. Although they are valuable assets, they are highly imitable and substitutable and do not enjoy imperfect mobility, which means that they are not a source of sustainable competitive advantage (Mata et al. 1995; Ray et al. 2005; Wade and Hulland 2004).

Melville et al. (2004) find, however, that the complementarity between IT infrastructure and the different business applications with IT human resource capabilities can create a temporary competitive advantage that explains the differences in organizational performance. Ray et al. (2005) determine that IT infrastructure (generic information technologies), in the presence of a high level of shared knowledge, influences better firm performance. Along these lines, Nevo and Wade (2010) define the concept of IT asset-organizational resource compatibility as the ability of an organizational resource to apply an IT asset in its regular activities and routines to increase the synergy between the different resources.

The existence of a specific IT department or of specific IT training programs will not sustain a better competitive position, since these elements can be acquired easily on the factors markets (Mata et al. 1995; Ross et al. 1996: Bharadwaj 2000). To measure IT physical assets, some authors use access to capital or IT spending (Mata et al. 1995). McFarland (1984) suggests that the capital needed to develop

and implement an IT innovation could constitute a source of sustainable competitive advantage, since many of these investments involve a high risk (increasing the cost of capital) and require a large amount of capital. Therefore, only some firms have the financial capability needed to undertake certain investments in IT. Further, according to Lieberman and Montgomery (1988), leading firms in applying IT innovation sustain greater risks than follower firms. Mata et al. (1995) analyze access to capital together with the capability to manage the market risk and technological risk associated with IT investments. These authors indicate that some investments require large amounts of capital for their development, making the cost of this capital greater or less depending on the technological or market uncertainty. Therefore, firms with the possibility of financing could obtain a temporary competitive advantage that derives from their privileged situation. Even when these IT investments require large amounts of financial resources and/or high levels of risk, they are not sufficient conditions for obtaining a sustainable competitive advantage. Initially, it is possible for firms that undertake such investments first to obtain a temporary advantage, but if the projects are performed successfully, the level of risk is low and thus the cost of capital will be less. Further, since the introduction of IT has become a necessity to compete in most industries (Ray et al. 2005), these assets do not explain the variations in organizational performance.

On the other hand, technological property refers to all of the legal ways of protecting IT innovations. Porter (1980) suggests that technology that can be protected will become a source of sustainable competitive advantage. There are few legal mechanisms to protect such innovations, however, and although some such as the patent are viable, they do not constitute authentic barriers to imitation. Total confidentiality is thus the only alternative for protecting an IT innovation (Mata et al. 1995), if there are no factors such as mobility of workers or formal or informal technical communication (Liberman and Montgomery 1988).

The literature review performed shows the great relevance of the different capabilities, inherent and not inherent in IT, in analyzing the effects of IT on organizational performance. Teece et al. (1997) develop the concept *dynamic capabilities* as the firm's capability to integrate, construct, and reconfigure internal and external competences to achieve fit quickly in a changing environment. Firms must develop dynamic capabilities to identify new opportunities and respond quickly to them. As a result of this study, the notion of dynamic capability has been included in studies of IT (Feeny and Willcocks 1998; Jarvenpaa and Leidner 1998; Bharadwaj 2000).

Based on our classification, with respect to IT human resource capabilities, we must distinguish between IT technical capabilities and IT managerial capabilities.

Mata et al. (1995) establish that *IT technical capabilities* can generate a competitive advantage, but only a temporary one, given the possible mobility of labor, among other reasons; in contrast, IT managerial capabilities are indeed a source of sustainable competitive advantage. This result is supported by much of the literature analyzed (among others, Ross et al. 1996; Ray et al. 2005). However, Melville et al. (2004) extend the results of Mata et al. (1995) to temporary competitive advantage, since the growing institutionalization and maturity of IT

service markets can enable outsourcing of technical functions and even functions related to management and directing of IT to specialized firms (*IT outsourcing*).

Melville et al. (2004) also propose the possible complementarity of IT assets to IT human resource capabilities as the basis for sustaining a temporary competitive advantage.

In any case, *IT-related managerial capabilities* are less imitable and less substitutable and enjoy less mobility than IT technical capabilities. Therefore, the former abilities, which often take concrete form in relationships with other agents, are the fruit of the evolution of the firm's activity and of many decisions taken over time, as well as accumulated experience, such that their degree of complexity is very high. IT managerial resources can thus be understood as the foundation of sustainable competitive advantages.

As to *organizational capabilities directly or indirectly related to IT*, the literature review shows their positive impact on organizational performance, since they complement the resources, whether inherent or not inherent in IT (Ross et al. 1996; Bharadwaj 2000; Sher and Lee 2004; Wade and Hulland 2004; Tanriverdi 2006). These are abilities developed in the organization, as the fruit of the evolution of the firm's activity, such that their degree of complexity will also be very high and will have repercussions for improvement in competitive position.

Finally, IT integration in the firm strategy is thus key not only for guaranteeing that an IT asset interact with an organizational resource, but also for ensuring that this interaction is consistent with the firm's organizational goals (Boudreau and Robey 2005; Uhl-Bien et al. 2007).

5 Conclusions and Managerial Implications

Understanding how both firm performance and the achievement of a sustainable competitive advantage are affected by IT resources is a key issue to justify the value of IT investment. This chapter develops a framework to analyze the relationships between different aspects of IT resources and firm performance which is consistent with the RBV and the perspective of IT-enabled organizational resources. The literature review suggests that IT has an indirect, not direct impact on firm performance. The IT resources' classification developed can suggest that assessing both IT technical and IT managerial capabilities in studying the relationship between IT and firm performance or competitive advantage can provide a better justification for IT spending. According to Barney (1991) firms only can sustain a competitive advantage based on resources that are valuable, rare, non-imitable and non-substitutable by other resources. IT assets (IT infrastructure, IT training programs or IT staff) are easily duplicable by the competitors; so firms cannot sustain a competitive advantage in the long-term based on these resources. Organizations should develop firm-specific capabilities based on strategies or routines that are not available in the factor market. In that sense, Pérez-Aróstegui et al. (2012) define IT competence as a multidimensional construct composed by IT infrastructure, IT technical and IT managerial knowledge and IT integration in the firm strategy.

This second-order variable can affect firm performance and competitive position by the mediate effect of different organizational capabilities or practices: leadership (Pérez-Aróstegui et al. 2012), new product development (Pavlou and El Sawy 2006), customer service quality (Ray et al. 2005) or business process reengineering (Albadvi et al. 2007). The IT-enabled organizational resources theory explains that IT can augment key practices or capabilities developed in the firm, which can result in improved firm performance (Bharadwaj 2000; Cagliano and Spina 2000; Ray et al. 2005).

Future research should focus on studying the complementarities between IT assets and other IT capabilities and organizational capabilities in general. The processes by which IT resources interact with other human and business resources, as well as the nature of these resources, is a topic that has received little attention to date (Ravichandran and Lertwongsatien 2002; Wade and Hulland 2004).

Managers must be aware that IT assets offer value only when they are related or embedded with other organizational capabilities, related directly or no with IT. Therefore, the development of IT-related resources and the complementarities with other organizational practices can lead to better competitive position or firm performance. In that sense, the development of managerial aspects of IT resources is crucial to justify IT spending and IT implementation success.

In sum, benefits derived from IT implementation depend on the firm's capacity to develop and manage its IT resources' according firm's strategy in order to take advantage of the synergies created.

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Appendix 1: Main IT-Related Capabilities

Authors	Human resource capabilities	Organizational capabilities
Benjamin and Levinson (1993)	IT learning	Ability to redesign business processes based on IT, IT capability to manage relationships with stakeholders, IT capability to manage organizational changes, IT integration with organizational strategy
Mata et al. (1995)	IT Technical capabilities, IT managerial capabilities	
Ross et al. (1996)	IT technical capabilities, management's leadership in establishing IT priorities	Orientation to problem-solving, IT capability to stimulate and exploit synergies among the different assets and capabilities, IT strategic planning, IT integration in firm strategy

(continued)

(continued)

Authors	Human resource capabilities	Organizational capabilities
Powell and Dent-Micallef (1997)	Managerial commitment to IT	Open communication, organizational consensus, open organization, teamwork, redesign of processes, integration of IT and firm strategy, IT planning, IT benchmarking
Jarvanpaa and Leidner (1998)	IT Leadership	Creating awareness to encourage experimentation with new technologies, organizational flexibility, IT strategic flexibility, integration between IT/firm strategy
Feeny and Willcocks (1998)	IT Leadership, IT technical capabilities, IT managerial capabilities	Ability to design IT architectures, capability to manage IT suppliers, IT integration in firm strategy and, IT outsourcing
Bharadwaj et al. (1999)	IT managerial capabilities	Capability to establish relationships with other agents and redesign business processes, integration of IT/firm strategy
Ravichandran and Lertwongsatien (2005)	IT technical capabilities, IT human resources specificity	IT planning, IT capability for development of systems, IT support
Li and Ye (1999)	IT managerial capabilities	Integration of IT/firm strategy, nature of the environment
Bharadwaj (2000)	IT human resources	Customer focus, IT synergies, open communication, IT capability to redesign processes, innovation focus, IT capability to the anticipation of future business needs, IT strategic flexibility, IT ability to coordinate different agents (suppliers, customers), IT planning
Byrd and Davidson (2003)	IT technical staff capabilities, management support for IT	IT planning, IT synergies in the supply chain, IT planning
Caldeira and Ward (2003)	IT technical capabilities, IT managerial capabilities, management commitment to IT	
Dehning and Stratopoulos (2003)	IT managerial capabilities, IT technical capabilities,	
Teo and Ranganathan (2003)	Management commitment to IT, IT managerial knowledge	Process redesign-based IT, ability to develop organizational flexibility, ability to develop relationships between organizations and develop IT, IT planning, IT integration into firm strategy

(continued)

(continued)

Authors	Human resource capabilities	Organizational capabilities
Tippins and Sohi (2003)	IT operations (technical abilities), IT managerial knowledge	
Melville et al. (2004)	IT Technical knowledge, IT managerial knowledge	IT synergies between business processes
Sher and Lee (2004)	Commitment of management	Capability to identify and take advantage of the synergies between IT and knowledge management (to use IT to process information related to other areas, such as marketing and various processes in the supply chain)
Wade and Hulland (2004)	Direction of the change in IS, technical IS abilities	Planning of IS, management of relationships with external agents, existence of relationships between IS and the business, market responsibility
Bhatt and Grover (2005)	Intensity of learning	Flexible infrastructure (related to the other business units), experience in IT
Piccoli and Ives (2005)	Technical abilities of IT personnel, managerial abilities of IT personnel	Synergies between different assets
Ray et al. (2005)	Technical abilities of IT personnel	Existence of shared knowledge, flexible IT infrastructure, orientation to the customer
Tanriverdi (2006)	IT abilities (both technical and managerial)	Culture favorable to understanding IT as a support for business, integration between IT/firm strategy, ability to manage relationships with other agents, synergies between own assets and IT capabilities, orientation to learning and accumulation of knowledge
Crawford et al. (2011)	IT Knowledge	IT—business relationship
Pérez-Aróstegui et al. (2012)	IT Technical and Managerial knowledge	IT integration of IT in firm strategy

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Strategic Flexibility in e-Business Adapters and e-Business Start-ups

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Abstract The proliferation of the Internet in today's society, combined with the need for greater strategic flexibility in organizations, has meant that most firms adopt e-business processes as a tool for creating competitive advantage. However, many established firms encounter difficulties in achieving the expected results. At the same time, it has been observed that numerous e-business start-ups have a special capacity for growing and for achieving a high level of competitiveness. In this article, we propose that the structures of learning that ground each type of firm have implications for strategic flexibility. Systems of management based on e-business generate greater strategic flexibility in organizations, but this influence is simpler, less costly, and more effective in its impact on performance in firms that come into being around e-business (e-business start-ups) than in firms that attempt to adopt and integrate e-business into their existing business models. Implications for management are also discussed.

Keywords E-business · Strategic flexibility · Competitive advantage · Organizational learning

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1 Introduction

Strategic flexibility provides a firm with the ability to respond promptly to market opportunities and changing technologies (Grewal and Tansuhaj 2001). Aaker and Mascarenhas (1984) define it as the ability of the organization to adapt to substantial, uncertain, and rapidly-occurring environmental changes that have a meaningful impact on the organization's performance. At the level of the organization, Sanchez (2004) suggests that strategic flexibility depends jointly on the inherent flexibility of the resources available to the firm and the firm's coordinative capabilities in applying those resources. Flexibility has often been seen as an aptitude for change in the organization or as the ability to exploit external opportunities (Dreyer and Gronhaug 2004). The adoption of information and communication technologies affects strategy, organizational structure, management systems, and human skills (Spanos et al. 2002). At the strategic level, technological innovations push firms to reorganize and to adapt to the market and competitive demands (Ward et al. 1998). Technological advances in such diverse fields as communication give organizations the ability to carry out real-time market research, reduce the time and cost of new product development, offer a wider product line, mass-customize products, and upgrade products at a faster pace than ever before. At the organizational level, information and communications technologies—and specifically, e-business—have positive implications for new work practices (Askenazy and Caroli 2010) and for numerical and functional labor flexibility (Arvanitis 2005).

E-business adoption modifies the organizational structure, responsibilities, and power relations inside the organization (Falk 2005). At a first glance, it seems that e-business enhances the flexibility of the firm directly. However, e-business involves implementation and learning costs that can diminish its advantages in the presence of certain organizational conditions or situations affecting the firm. Specifically, implementing e-business involves high costs of change in firms that are established in the market. The costs of learning incurred due to such implementation mean that e-business has only a limited effect on the results of the organization (Adams et al. 1998; Zhu and Kraemer 2005). In contrast, many start-ups develop from the advantages that the technology itself creates, both for the market and for the organization (Van de Ven et al. 1989; Vesper 1990; Pelled et al. 1999). Thus, the influence of e-business on the firm's results is more direct and more immediate.

In the current study, we provide a view of the adaptive capacities (strategic flexibility) that firms have for adopting e-business and making it valuable (Ashurst et al. 2012), distinguishing between incumbent and start-up firms. We believe that this distinction is of particular interest for research on strategic flexibility and e-business, since it permits us to approach the problem of the capacity of management to implement business systems and processes that endow the firm with greater flexibility (Phillips and Wright 2009). Phillip and Wright have analyzed the impact of e-business on organizational flexibility, identifying the key

organizational factors that influence flexibility and must then be managed. However, a gap exists in the literature concerning the role of organizational inertia and environmental inertia in the adoption of new technological advances. We explore this gap and advance some propositions to explain why not all e-business adopters succeed. We add a moderating factor to the literature through our distinction between firms that emerge around e-business technology and firms that adopt this technology. The main reason for this distinction is that, in the implementation of e-business, organizational inertia and the learning system play an important role in the success of the technology. In this article, we propose that the success of e-business in a firm is influenced by the firm's learning system and the role of e-business in the configuration of the business model. We suggest that this learning system will be more agile in firms that have emerged in more dynamic environments and in firms that have been created more recently around Internet opportunities.

The article is structured as follows. We begin by proposing an approach to the implications of e-business as a technological innovation to foster strategic flexibility, and thus to improve organizational performance. We then analyze the ease by which these systems may be adopted in the two types of firms, given the difference in the learning systems developed by each type. Start-ups emerge from a specific situation in the technological environment, whereas incumbents must mobilize their resources to adapt to this environmental reality. Our conclusions will therefore articulate the connections between some observations on the advantages of one kind of firm over the other as the firm attempts to make e-business profitable.

2 Strategic Flexibility and e-Business

In the past few decades, the gradual incorporation of information and communication technologies and, more specifically, of e-business in firms is permitting organizations to achieve greater internal and external flexibility through innovation. For example, Kohler et al. (2009) suggest that digital technologies promote and stimulate creativity and innovation, which in turn lead to the introduction of change. Through the implementation of e-business models, organizations have attempted to create new structures and technologies in order to make themselves more flexible (Phillips and Wright 2009). E-business can be defined in several ways. On some occasions, we find the term used in association with e-commerce. Swaminathan and Tayur (2003) define e-business as a business process that uses any electronic medium, as a channel for effecting commercial transactions. Other authors have attempted to define electronic commerce as the use of the Internet to perform or support entrepreneurial activities (Barua et al. 2001; Zhu and Kraemer 2002). The last of these definitions gives us a somewhat wider view of e-business, since the consequences for organizations of using the Internet clearly changes the organizations' internal processes, as well as the nature of their external activities

with customers and providers (Phillips 2003). Along the same lines, following Geoffrion and Krishnan (2001), and to give an indication of the wide range of economic activity in which e-business may be applied, we identify three main areas: (1) actions oriented to the consumer (business-to-consumer, consumer-to-consumer, and government-to-consumer); (2) actions oriented to support activities (business-to-business, business-to-government, and government-to-business); and (3) the infrastructure of the e-business technology (infrastructure of the network, network applications, and software tools). The organization is the unit that must decide what to use in each area of business, based on the strategy proposed and the kind of action that it wishes to implement in the network.

In this paper we consider e-business as a technology that facilitates information, communication, and transactions in any supplier–consumer relationship, even among the groups or individuals within the organization. The technology also applies to relational capital, in that it facilitates information, communication, and transactions among partners. E-business thus constitutes a new way of doing business because it changes the way in which economic agents interact and perform transactions. Because e-business changes the way of seeing traditional business, it has considerable repercussions in the great majority of firms. With the implementation of virtual business transactions, we have eliminated many physical barriers, within the firm as well as in the interaction between the organization and its environment. The virtual market is characterized by the nearly total absence of geographical barriers (Amit and Zott 2001). This specific aspect of e-business means that its market is characterized by extremely high connectivity, which can enable the firm to interact directly with its customers and providers (Zhu 2004). Because the virtual market eliminates many intermediaries, it also reduces some risks in transactions (Welty and Becerra-Fernández 2001). In addition, e-business can enable the firm to connect with geographical regions that are otherwise difficult to access (Steinfield et al. 2002). Such connection encourages the opening of new market niches.

In addition to the changes that e-business brings in the firm-environment interaction, we must also take into account the impact of e-business within the organization. This impact occurs through transformation in technologies and transformation in the internal structures of the organization (Chatterjee et al. 2002). Firms facing the expansion of the virtual market have a pressing need to generate organizations that are ever more virtual (Whinston et al. 1997). Firms are therefore changing their business processes and adopting e-business-based models increasingly and to a greater extent.

Strategic flexibility is connected to the firm's capacity for survival in turbulent environments (Knot et al. 2001). The degree of turbulence and the competitive pressure in the environment foster the use of e-business (Dos Santos and Peffers 1998). More and more, firms are working to develop flexible strategies and structures. Strategic flexibility is grounded in the use of e-business as a medium of interaction with an increasingly virtual environment in which it is ever more necessary to build on the e-process as the foundation for generating new internal processes (Phillips 2003). For this reason, organizations that adopt e-business enter

into a dynamic that provides constant feedback, leading them to implement effective transformations continually (Sharma 2004). E-business means less dependence on the structures of the market, which in turn generates greater flexibility and thus greater possibilities for success (Bhandari, et al. 2004).

Proposition 1 The adoption of e-business generates greater strategic flexibility than is found in organizations that do not adopt such technologies.

3 Strategic Flexibility and Performance

A firm is flexible if it is capable of changing as the environment changes. The challenge of strategic management is to confront change using flexibility and constant adaptation in order to achieve good fit between the firm and its environment (Drazin and Van de Ven 1985; Venkatraman 1989). This perspective, with its focus on fit, is drawn from contingency theory, which posits that organizational performance is the result of the alignment (fit) between organizational variables and context variables (Burns and Stalker 1961; Lawrence and Lorsch 1967).

Environment and strategy interact in a process of dynamic coalignment, and the resulting strategy-environment coalignment has positive implications for performance (Miles and Snow 1994, Lukas et al. 2001). Based on two different samples drawn from the PIMS data base, Venkatraman and Prescott (1990) find strong support for the proposition that the coalignment between environment and strategy has a positive impact on performance. Using a framework based on contingency theory, various recent studies of strategic flexibility have addressed the implications of organization-environment coalignment for performance (Sanchez 1995; Suarez et al. 1995; Young-Ybarra and Wiersma 1999; Grewal and Tansuhaj 2001; Johnson et al. 2003).

Based on previous research, we expect firms that have achieved strategic flexibility to find that this flexibility has a positive influence on firm performance, since it will enable them to remain coaligned with the environment. Our point of view can thus be summarized in the following proposition:

Proposition 2 Strategic flexibility is positively associated with organizational performance.

4 Start-ups and e-Business

In many studies, e-business has been associated with start-ups (Van den Ven et al. 1989; Vesper 1990). This is the case because start-ups are usually the first organizations to identify and incorporate potential commercial opportunities. They are usually also the first to recognize new needs in their customers (Dougherty 1992). In spite of the proximity of start-ups to the market and their genesis from the

conditions of the market itself, the success rate of newly created organizations is low (Nesheim 2000). This low success rate may be attributed to the fact that the creation of a new business is a process with many obstacles (Reynolds and Miller 1992; Van den Ven 1992). Nevertheless, start-ups have specific qualities that make it easier for them to be flexible and to adapt to the environment.

Research on the genesis of start-ups finds that entrepreneurs usually use contacts—that is, network connections—that can provide them with access to the resources that they need (Li and Zhou 2010; Wu et al. 2008). These networks establish the bridges needed to come to know information, markets, and technologies (Gulati et al. 2000). If we focus more specifically on the virtual market, we find that these networks are more powerful because they generate relationships without intermediaries between customers, providers, firms, and partners (Shapiro and Varian 1999; Prahalad and Ramaswamy 2000). They also create ties that reduce the cost of interaction between organizations (Butler et al. 1997) and foster the flow of information characteristic of markets with open standards between providers and manufacturers (Zhu 2004). In addition, these networks are subject to the bullwhip effect (Lee et al. 1997), which may occur when providers and manufacturers increase or decrease their sales forecasting by means of the supply chain.

Different studies have shown that firms employ technology to maintain a competitive advantage (Clemons and Row 1991). Saini and Johnson (2005) argue that information technologies influence competitive advantages if technologies are oriented to the market. Good fit between information technology resources and market demands has a positive impact on the firm success (Stoel and Muhanna 2009). In the case of start-ups, the organization obtains the technical knowledge that it needs from its earliest moments from the entrepreneur and the group of people who decide to accompany the entrepreneur in the firm's founding (Vesper 1990). The prior knowledge of the founding team, the team's way of gathering and processing its information, and the number and variety of solutions that they generate affect the knowledge available to the firm (Pelled et al. 1999). Thus, for example, a study of high-technology firms found that the entrepreneurs had participated in activities related to the industry for nearly four years prior to starting their own businesses (Van de Ven et al. 1989). Such studies show that start-ups do not have zero know-how at the moment of creation. Rather, the founding members contribute their prior experience and knowledge, creating some path dependence (Teece et al. 1997; Stack and Gartland 2003). Further, the initial circumstances at the moment of creating the firm condition the subsequent development of the organization (Cooper et al. 1994), such that start-ups in their early stages have not had sufficient time to consolidate their group learning. They therefore frequently attempt to repeat the actions that have led them to achieve their success (Schein 2010). As a result, if organizations do achieve success in their early, embryonic phases, they will validate these early actions and accumulate successful intramural knowledge and good extra-mural reputation (Dierickx and Cool 1989).

In the first, or embryonic, stage of the firm, the application of technological innovation shapes the emerging interdependence between the new members of the firm, the firm's technology, and the environment (Cummings 1981). Innovation is

the key to processes of setting up organizations and may be considered to be the combination of the prior technical knowledge (Kogut and Zander 1992) that emerges from the accumulated individual and collective experiences of the members. From the socio-technical perspective, we consider tacit experience to be the fruit of combining people and technology, which generates crucial competitive knowledge that cannot be replicated easily by competitors (Leonard and Sensiper 1998). This combination stems fundamentally from the learning possessed by the members of the organization. Zollo and Winter (2002, p. 340) define organizational learning as "a learned and stable pattern of collective activity through which the organization systematically generates and modifies its operating routines in pursuit of improved effectiveness." Huber (1991) argues that organizational learning should potentially be useful for the organization, indicating that learning develops knew knowledge or ideas that can in turn change behavior.

Organizations that learn manage to maintain a good balance of adaptation and continuous renewal that are in touch with the demands of the environment (Jaw and Liu 2003). This learning is especially intense in the early stages of the firm's formation. Start-ups are more agile and more dynamic in their learning than are incumbent firms, since start-ups' know-how has not been developed as fully, due to the absence of shared experience and their speed in correcting errors (Argyris and Schön 1978). In addition, learning is believed to be contextual; that is, it is related to the moment and the situation in which the learning occurs (Berger and Luckman 1967; Nonaka 1994). Therefore, e-business start-ups are strongly connected to the current market in this first stage of learning, particularly in a global and highly interconnected environment (Zhu 2004). In sum, the e-business start-ups that emerge in relatively new environments with significant technological ambiguity and turbulence (Jawaroski and Kohli 1993; Lichtenthaler and Ernst 2007) speed up their learning processes, as these processes are a key strategic resource; and they orient their strategy to the acquisition of knowledge (Winter 1987).

An agile, dynamic learning system has implications for both the strategic and the organizational levels. A number of authors stress that the fundamental role of the learning system is to nurture the capacity to be flexible (Adler 1988; Nemetz and Fry 1988) and demonstrate the positive relationship between organizational learning and performance (for example, Bontis et al. 2002; Schroeder et al. 2002). Strategic flexibility based on the implementation of new technologies is considered to be an ability that determines the relative success of incorporating the new uses that electronic commerce requires (Malhotra 2001). Additionally, through e-business, firms can easily capture information from customers and suppliers, which enables them to respond faster to these groups' demands (Borges et al. 2009).

At the level of the organization, newly created firms use emerging strategies that are grounded in organic structures (Burns and Stalker 1961), since such firms are fully immersed in the process of establishing their structure and have not had time to create repeated structures. Among the emerging strategies, we find "strategy as simple rules" (Eisenhart and Sull 2001), whose main characteristics are simplicity of guidelines and regulations in the organization and

decentralization of decision-making. These rules help the organization to achieve rapid, flexible responses in global and uncertain environments such as e-business, thereby generating simple and flexible structures.
Based on the foregoing arguments, we propose:

Proposition 3 New firms that emerge around e-business (e-business start-ups) generate great strategic and organizational flexibility, which are the fruit of a more dynamic learning process than the learning process of incumbent firms.

5 e-Business Adoption in Incumbent Firms

The proliferation of the Internet in our current knowledge society—and, more specifically, the Internet's possibilities for generating business transactions on a very large scale, as has been seen with the peak in firms related to information and communications technologies—has meant that the majority of firms in traditional sectors have set their sights on the possibilities of Internet business. Traditional firms look for openings that will enable them to enter the Internet market, develop adaptation strategies, and attempt to transform the organization itself (Earl 2000) in the search for success and positive business results. Organizations that wish to adapt their business to the virtual market must fit their processes and structures to this market's demands (Stroud 1998).

If the start-ups related to e-business emerge from new potential in the technology itself, established firms in more traditional sectors, in contrast, approach technology as a question of adoption and thus of adaptation. The use of e-business leads organizations to make structural changes by means of disintermediation and reintermediation (Bakos 1998). In their desire to align themselves with the demands of the external market, organizations must align their internal management with strategies that are appropriate for e-business (Phillips 2003).

Organizations are, however, institutions that are "incapable of freeing themselves from their own history" (David 2001, p. 19) and, according to the literature on organizational learning, organizations learn, remember, and apply lessons from the past (Huber 1991; Walsh and Ungson 1991). In the world of technology, organizations should explore the new conditions in their environments, creating innovative products and services in these markets (Jansen et al. 2006; Levinthal and March 1993). To this end, e-businesses act according to new and different rules, and the organization must learn constantly, from its earliest moments. In the case of established firms, understanding these rules is achieved through business processes that are validated by prior experience. Adaptation is, therefore, a complex process. Krell and Gale (2005) propose that the change to e-business involves a difficult evolution, in which the organization must integrate technology, business process, strategy, and organizational change. Organizations must prepare employees for the adoption of e-business (Lai and Ong 2010).

In reality, organizations' ultimate goal in the use of e-business is to expand their business and to improve the organization's results (Zhu and Kraemer 2005; Tan,

Pan, and Hackney 2010). However, achieving this goal involves profound changes that firms are not always willing to undertake. On the external level, it has been found that organizations are reluctant to make significant changes, due to the fact that they have specific "networks of interdependence, both with external agents (buyers, providers, banks…)" (Tushman and Romanelli 1985, p. 177) and within the organization itself. Internal resistance comes from the fact that organizations' path dependence can inhibit these transformations (Gedajlovic et al. 2004), as firms have already set up their organizational routines, which involve "certain repetitive patterns of interdependent actions, performed by multiple actors" (Feldman and Pentland 2003, p. 95).

Routines are necessary for the organization, and the repetition of specific actions permits and fosters learning, as it helps individual members to interpret the meaning of the organization's processes (Pentland and Feldman 2005). Organizations are constituted of a multitude of routines, such as "generative" systems that are created from performance and organizational interaction (Feldman and Pentland 2003; Pentland and Feldman 2005; Zbaracki and Bergen 2010).

As organizations grow, most develop protocols for their knowledge and technologies. They do this through the development of procedures that foster the use of routines and practice in order to apply these routines and practices in a comprehensive way throughout the organization (Zander and Kogut 1995). Thus, the organization and its members are able to adjust to the situations they face through the repetition of prior experiences (Sternberg 1985). Such adjustment occurs through a process in which the decision to undertake similar actions is inferred in the face of similar situations (Kolonder 1994). And here lies the source of the problem: situations are not always similar; environments change, thereby changing the situation of the organization. The organization should aspire to achieve a state in which it can review its old routine and choose a new one if the routine does not resolve the conflict or problematic situation that the organization faces (Gong et al. 2005).

We find, however, that the learning associated with organizations with a large amount of accumulated experience and solid routines that have been translated perfectly into protocols is related to learning involving exploitation (March 1991), single-loop learning (Argyris and Schön 1978; 1996), and evolutionary learning (Weick and Westley 1996). Because these forms of learning are sedimentary, they tend to generate solid structures that are shared by the members of the organization. And the routines or patterns of functioning (Feldman and Pentland 2003) are converted into organizational inertia. Huff et al. (1992) describes organizational inertia as a series of mechanisms in institutions that foster maintenance of the status quo, inhibit strategic renewal, and feed only into the strategy currently in effect. Organizations that have generated inertia are inhibited by one of the most significant limitations on both learning from the market and developing the products that the market requires (Adams et al. 1998). Such organizational inertia is one of the main costs of change or adaptation.

The organizations described above tend to use modes of doing that are familiar to them and technologies that are already established, at least to the extent that this

is possible (Geels 2004). They may even introduce e-business procedures that do not increase their performance (Cook et al. 2004), primarily because in most cases they imitate the processes of others instead of introducing new functions and services. Nonaka (1994) suggests that organizations should reform their old procedures and foster the generation of new ones, since technology comes to create "dynamic rigidity" if it does not generate flexibility for the organization (Staudenhaier 1989).

When firms grow in size, they have more slack resources and more resources available to them. They are thus more predisposed to implement new processes (Tornatzky and Fleischer 1990; Verdu-Jover et al. 2006), increasing the probability of adoption of new technologies (Gomez and Vargas 2009). However, Zhu and Kraemer (2005) find that large organizations are overwhelmed by their structural inertia and indicate that this inertia may be attributed to prior situations or ingrained structures, as the use of new process technologies requires the integration of innovation in most activities of the firm (Gomez and Vargas 2009). Structural inertia can cause the application of new uses to take longer, and such delay can limit the value that might be created through the implementation of e-business systems (Thong 1999).

Proposition 4 Already-functioning firms (incumbents) that adopt e-business incur high learning costs that make it harder for them to develop their capacity to adapt and thus their strategic flexibility than for start-ups.

All 4 propositions are illustrated in Fig. 1

6 Discussion and Conclusions

Organizations' adoption of e-business, where e-business is understood as a system of interaction both with the external environment and internally within the organization, stimulates adaptive capacities and thus the flexibility inherent in firms themselves. However, the potential of e-business to generate benefits for the firm is greater in those organizations that emerge from e-business itself than in firms that implement electronic commerce in order to open a pathway to the virtual market.

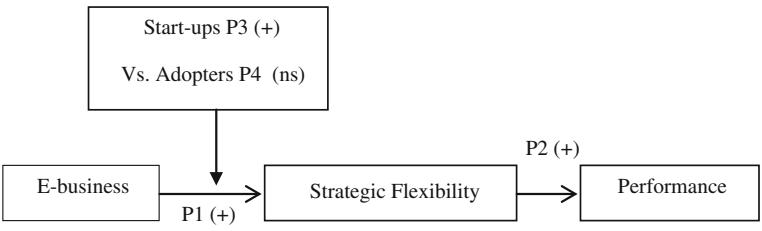

Fig. 1 Theoretical model

The main reason for this difference lies in the agility of the learning system that is generated in start-ups. In addition, start-ups are firms that are designed in response to new potentials in technology itself and that attract people who are already integrated into and familiar with e-business. As a result, the members of these organizations hardly need to develop adaptive processes. Further, in cases that do require the adoption of such processes, the cost of change is very low compared with the cost in established firms.

Numerous incumbent firms in many different industrial sectors are adopting some kind of e-business in their basic processes for generating value. In most cases, these processes clash with the organizational inertia in the firm itself, and the firm's learning processes are not sufficiently agile to ensure that the change is not excessively costly to the firm. This does not mean, however, that firms are unable to achieve desirable levels of strategic flexibility. Rather, it means that they are slower to do so and that the cost of the change is greater than it is in start-ups. Because of this difference, the effects of these changes on performance are more moderate.

At the level of the organization, we can also speak of the human cost of adaptation. Organizations either change or do not change, adapt or do not adapt. And the firm does not usually take into account that the organization's members do not usually change unless the organization itself changes. The resistance to change expressed by the organization's members may stem from the fact that the benefits the organization may obtain are not in harmony with the benefits that the individual members composing the organization can obtain, as these individuals are the ones who must make the change (for example, Coch, and Frenc 1948; Tichy 1983; Zaltman and Duncan 1977). Organizations that are burdened with a certain amount of inertia in their routines are not able to change unless they remain constantly aware of the social cost of the new technical adaptations (Trist et al. 1963). To solve this problem, some incumbent firms have created new business units that are relatively autonomous, independent of the rest of the organization. Such a strategy attempts to achieve the advantages possessed by e-business start-ups. A certain degree of organizational independence reduces the negative effects of inertia, although the units' isolation is never complete, since top management always attempts to imprint on the new strategies some part of the path dependence generated by its own experience in organizational systems and traditional ways of interacting.

Organizations that wish to change must sketch a possible future according to the external reality in which they seek to grow and develop. Sharma (2004) proposes a model of change management for e-business that involves three steps: (1) people, (2) processes and technology, and (3) external agents. Keeping in mind the people involved and their potential for learning and adaptation is one of the key issues for successful implementation of a change that requires the implementation of the technology that is being accepted and adopted in the external environment.

Drawing on the theory of dynamic capacities (Teece et al. 1997), we propose two complementary perspectives that have implications for flexibility. The first of these is the dependence on external knowledge to drive improvement in

performance by means of innovation (Ireland et al. 2002; Zollo et al. 2002). The second is the improvement of internal processes to recuperate the resources and operating routines of organizations in order to make these more appropriate to and effective in the situation that the organization faces (Zhara et al. 2006). Organizations should forget and erase part of their path dependence, as this trajectory ties them down and prevents them from advancing. They must instead generate path-creative routines that foster the modification of their strategies (Garud et al. 2010), both internal and external.

Based on our model, we propose that incumbents are generally influenced by organizational inertia that makes it difficult for the adopters of e-business to translate its advantages into organizational performance. Start-ups are also influenced by inertia, but they are more influenced by environmental inertia than by organizational inertia. In fact, most start-ups emerge in an attempt to exploit market tendencies. We thus find some implications for strategic flexibility theory. Start-ups are not flexible by definition, but their learning system is more dynamic and the cost of change is lower than in incumbents. Start-ups are more flexible than established firms, since their organizational structure, culture, and routines are still in a process of consolidation. Established firms have a history and are thus influenced by path dependence (Teece et al. 1997; Stack and Gartland 2003).

As implications for managers, we suggest that incumbents that wish to adopt e-business should develop new e-business-based business units with teams from outside the firm that are highly skilled in information systems and thus unlikely to be influenced by the firm's organizational inertia. Firm managers should give these teams basic information about the content of strategy but not about the processes by which to develop and implement this strategy. Such an approach could help to isolate adaptation processes from organizational inertia and to enable new business to be based only on environmental inertia. E-business start-ups have newer learning processes and lower costs, which makes them more agile and flexible. These characteristics help to explain why while many high-tech companies that have consolidated and developed organizational inertia have difficulties in adopting new processes, while start-ups grow rapidly due to their alignment with the environmental inertia.

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First-Mover Advantage in the Internet-Enabled Market Environment

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Abstract The past quarter century has been characterized by major and game changing market developments such as the evolution of the competitive market environment from a physical market environment (PME) to an Internet-enabled market environment (IME) that encompasses both the physical and electronic marketplaces, and the digitization of an increasing number of information products. Such developments raise questions concerning the extent to which extant perspectives on first-mover advantage developed in the context of the PME hold in the IME, generally, and for information products in digital form specifically. This chapter addresses this issue by developing a conceptual framework that focuses on selected sources of first-mover advantage delineated in the extant literature and advancing two sets of propositions. The first set of propositions focus on sources of first-mover advantage (network externalities, consumers' non-contractual switching costs, technological leadership and innovations, consumers' information asymmetry and consumption experience asymmetry, spatial resource position and installed capacity) that can be expected to have a greater versus lower effect in the IME relative to the PME. The second set of propositions focus on the moderating effect of product form (information products in digital form versus information products in analog form and non-information products).

Keywords First-mover advantage · Market pioneering advantage · Competitive advantage · E-commerce strategy · Internet strategy · Marketing strategy and competitive strategy

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1 Introduction

Major changes, discontinuities, and disruptions in the competitive market environment often necessitate a critical reassessment of the applicability, transferability, relevance, and/or need for refinement of extant marketing perspectives. In recent years, as a consequence of the commercialization of the Internet, the market environment has evolved from a physical market environment (PME) to an Internet-enabled market environment (IME) encompassing the physical and electronic marketplaces. Furthermore, a number of information products that were previously available only in analog form have become increasingly available in digital form. Although the availability of information products in digital form (e.g., music and software on CDs) preceded the emergence of the IME, the Internet has also emerged as an important channel for their distribution (e.g., direct distribution of music and software over the Internet). Against this backdrop, we revisit extant perspectives on first-mover advantage, a topic that has consistently retained an important place in the strategy literature.[1] Specifically, we focus on the following issues:

1. The potential sources of first-mover advantage explicated in extant literature that are likely to have a (a) greater effect in the IME relative to the PME and (b) lower effect in the IME relative to the PME.
2. The moderating role of product form (digital versus analog) on sources of first-mover advantage which are likely to have (a) a greater effect in the IME relative to the PME, and (b) lower effect in the IME relative to the PME.

The conceptual analysis of the extendibility of extant perspectives on first-mover advantage, presented here, makes an important contribution to our understanding of first-mover advantage by demonstrating that the efficacy of certain sources of first-mover advantage change as the competitive market environment becomes Internet-enabled and information products are digitized. Specifically, our conceptual analysis suggests that network externalities, consumers' non-contractual switching costs, and technological leadership and innovations as sources of first-mover advantage assume greater importance in the IME. In contrast, consumers' choice behavior under conditions of information and consumption experience asymmetry, spatial resource positions and installed capacity diminish in importance.

The chapter is organized as follows. First we provide an overview of considerations that highlight the need for a critical reassessment of extant perspectives on first-mover advantage. This is followed by an overview of extant perspectives on

[1] Consistent with the literature, we adopt a broad definition of the term, first mover, as the first entrant in a category to enter in a meaningful scale. Furthermore, much of the first-mover advantage is derived in cases where there is a reasonable gap in entry timing between the first mover and later entrants, so we focus on those cases. We explain these issues in greater detail in the subsequent section.

first-mover advantage, the Internet-enabled market environment and information products. Third, in reference to six potential sources of first-mover advantage explicated in extant literature, we address the question of whether they are likely to be of greater or lesser importance in the IME than in the PME. To this end, we advance a conceptual framework and propositions. Finally, we discuss the implications of our framework and propositions for competitive strategy and suggest directions for future research.

2 First-mover Advantage: The Rationale for Revisiting Received Wisdom

Figure 1 provides an overview of developments in the product-market space that highlight the need for a critical reassessment of the extendibility of the sources and degree of first-mover advantage to the IME and to products in digital form. The horizontal axis in Fig. 1 denotes *digitization in the product environment*. The vertical axis denotes *digitization in the market environment* and its evolution to an Internet-enabled market environment. Cell 1 in Fig. 1 denotes the frame of reference of extant literature on first-mover advantage. This cell shows the received wisdom on the sources of first-mover advantage in the context of a broad spectrum of products, including goods (tangibles-dominant products) and services (intangibles-dominant products). Cell 2 highlights the rationale for reassessment of

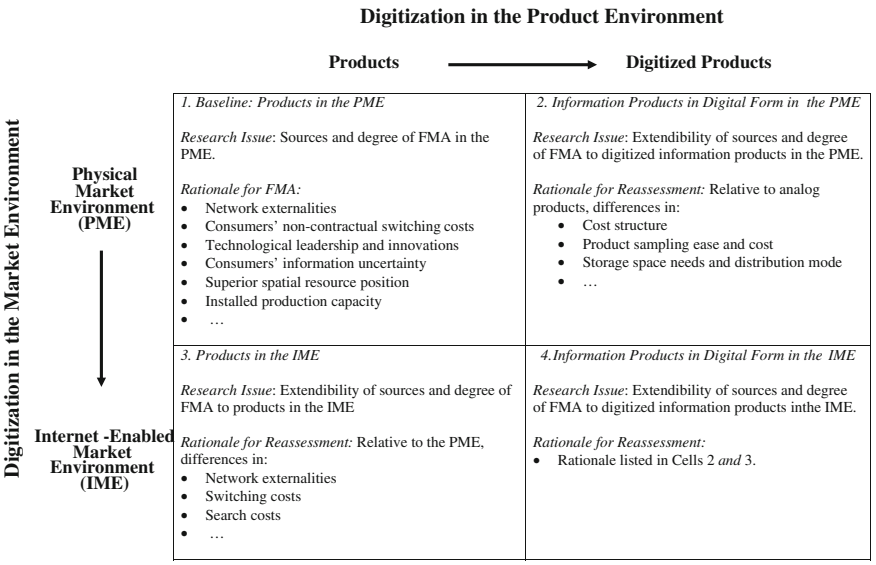

Fig. 1 First-mover advantage (*FMA*): extendibility of extant perspectives to an internet-enabled market environment

extant perspectives on first-mover advantage listed in Cell 1, following digitization of information products. For information products, digitization in the product environment denotes digitization of the product's core attributes (e.g., from music in analog form on cassette tapes to music in digital form on a compact disc or the hard drive of a computer). Although not explicitly shown in the figure, for non-information products, digitization in the product environment also denotes the digitization of the information-based attributes of the product (e.g., a web site describing different option packages available for an automobile). Given that the marketing of digitized information products exclusively in the PME (Cell 2) represents an earlier time period (e.g., music and software stored on CDs and sold through bricks-and-mortar retail outlets), we focus primarily on Cells 3 and 4 which represent the current and evolving product-market environment. Cell 3 highlights the rationale for reassessment of extant perspectives on first-mover advantage listed in Cell 1, pursuant to digitization in the market environment for a broad spectrum of products. Cell 4 highlights the rationale for reassessment of extant perspectives on first-mover advantage listed in Cell 1 following digitization of both the market environment and the product environment for information products. That is, an environment characterized by the digitization of information products and the use of the Internet as a channel for their distribution (e.g., music from Apple's iTunes).

Conceptual literature on issues pertaining to first-mover advantage in the IME is characterized by competing views and is somewhat limited in terms of the range of issues examined. For instance, Porter (2001) questions first-mover advantage on the Internet by pointing to two key difficulties involved in sustaining a first-mover advantage in the electronic marketplace. First, he argues that since switching costs are quite low, a later entrant who is "just a few mouse clicks" away can entice customers from the first-mover by offering a superior value proposition. Second, he notes that exploiting network externalities may not be as easy as firms may have originally envisioned. However, Downes and Chunka (1998) and Tapscott (2001), among others, extol the virtues and importance of first-mover advantage in electronic market environments. Amit and Zott's (2001) framework of how firms can create value in electronic market environments suggests that first-movers are presented with many opportunities to "lock-in" customers [see, however, Suarez and Lanzolla (2007) for a discussion of potential difficulties that may stem from environmental dynamism].

Emerging evidence from empirical and analytical studies on first-mover advantage in the IME is also mixed. For instance, Lieberman (2005) found that first-movers enjoyed a premium in market capitalizations only in markets characterized by network effects and when first-movers entered with patented innovations. However, first-movers generally enjoyed only a minimal survival advantage over other firms (for similar results in the online retailing context, see Nikolaeva 2007). Based on this evidence, Lieberman (2005) concluded that "[t]he view that first-mover advantages are pervasive throughout the Internet sector is clearly incorrect." Geyskens et al. (2002) investigated the financial consequences of adding Internet channels in the publishing industry and concluded that early

followers have an advantage relative to pioneering firms. A contrasting conclusion is reached by Dewan et al. (2003) in their analytical framework, which suggests that pioneering firms, through customization efforts, can create sustainable competitive advantages and deter entry by other firms (see also; Kuksov 2004; Lee and Grewal 2004). Such contrasting views on the extendibility of extant perspectives on first-mover advantage to the IME attest to the need for further research.

3 First-mover Advantage, the Internet-enabled Market Environment and Information Products: An Overview

3.1 First-mover and First-mover Advantage

While the terms first-mover and market pioneer are often used interchangeably in the literature, Chandler (1990, p. 132) notes: "It is important to distinguish first-movers from the inventors of a product or process and from the pioneers who first commercialize the innovation. In the main frame computers, for example, several pioneers invested in marketing the new machines on a national scale. But it was IBM's massive investments in the production, distribution and management of the System 360 that made it the industry's first-mover." Further, Chandler pointed out that often there can be more than one first-mover in an industry. We use the term *first-mover* to refer to the first firm to enter a market supported by sizeable investments in the production, marketing and distribution of the product, and the elapsed time between its entry and that of later entrants is of sufficient magnitude so as to allow the first-mover to achieve advantageous resource positions. We use the term *early movers* or *early entrants* to refer to multiple firms entering a market in short succession with sizeable investments in the production and distribution of a product and being able to achieve advantageous resource positions. For ease of exposition, we use the term first-mover in the remainder of the chapter.

Lieberman and Montgomery (1988, p. 41) define *first-mover advantage* as "the ability of pioneering firms to earn positive economic profits (i.e., profits in excess of the cost of capital)." In many industries and product-markets, on average, surviving first-movers or early entrants have been found to command a higher market share than surviving non-innovative late entrants (e.g., Lambkin 1988; Shankar et al. 1999; Urban et al. 1986). This observed pattern of relationship suggests that under certain organizational and environmental conditions, early entry can be a normative strategy conducive to superior marketplace and financial performance, due to the competitive cost and differentiation advantages associated with being a first-mover (Lieberman and Montgomery 1988; Kerin et al. 1992). However, extant research on the relationship between order of entry and survival is equivocal. While some studies report a higher failure (lower survival) rate for first-movers

(Lilien and Yoon 1990; Golder and Tellis 1993), others report a higher survival rate for first-movers (Mascarenhas 1992; Robinson and Min 2002). Studies focusing on situational contexts in which the survival risks for first-movers are higher versus lower provide additional insights into this issue (see, e.g., Srinivasan et al. 2004; Min, Kalwani and Robinson, Min et al. 2006; Suarez and Lanzolla 2007). Some studies highlight advantages for early followers over first-movers under specific conditions (e.g., Lilien and Yoon 1990; Shankar et al. 1999). A number of published works on first-mover advantage in the genre of integrative review articles (Lieberman and Montgomery 1988; Kerin et al. 1992), meta-analysis (Szymanski et al. 1995), and empirical generalizations (Kalyanaram et al. 1995) also provide valuable insights.

3.2 Internet-enabled Market Environment

Building on Amit and Zott's (2001, p. 495) definition of virtual markets and Varadarajan and Yadav's (2002, p. 297) definition of the electronic marketplace, we define the *Internet-enabled market environment* as a setting that enables buyers and sellers to exchange information, transact, and perform other activities related to the transaction before, during, and after the transaction via an information infrastructure network and devices connected to the network based on Internet protocol. Here, networks are construed broadly to encompass open and proprietary (e.g., extranet and intranet) networks, based on both fixed and wireless technologies. Also, buyers and sellers may choose to perform all or only a sub-set of purchase-related activities in the IME. That is, an IME does not automatically imply exclusive reliance on the Internet by buyers and sellers to perform all of the purchase-related activities.

Relative to the PME, several characteristics of the IME are noteworthy. The transactional environment is information rich, buyers' information-search costs are lower, and information asymmetry between sellers and buyers is diminished (see Ellison and Ellison 2005; Varadarajan and Yadav 2002, Yadav and Varadarajan 2005a, b). Researchers have shown a keen interest in exploring how consumers operate in, and are likely to be affected by, this new networked market environment. Extant work in the area, both conceptual (e.g., Alba et al. 1997; Peterson et al. 1997; Yadav and Varadarajan 2005a, b) and empirical (e.g., Lynch and Beck 2001; Pan et al. 2002), provides insights into the benefits that consumers may derive and market outcomes in an IME. These benefits stem largely from declining search costs (Bakos 1991; Brynjolfsson et al. 2003; Huang et al. 2009; Ratchford et al. 2007) and the ability of buyers to manipulate information in online decision-making contexts (Haubl and Trifts 2000). However, it remains unclear whether these new capabilities always result in superior consumer choices and favorable market prices (Pan et al. 2002; Spann and Tellis 2006).

3.3 Information Products

Shapiro and Varian (1999) view information as anything that can be digitized—that is, encoded as a stream of bits. While information refers to anything that *can* be digitized, information products can exist in digitized and non-digitized (i.e., analog) forms. The co-existence of information products in both analog and digital forms is quite pervasive (e.g., magazines and newspapers printed on paper and accessible online, and movies on videotapes, digital video discs and streamed over the Internet). However, it is also conceivable that an information product in digitized form might eventually displace the analog version of the product (e.g., displacement of the printed encyclopedia by the CD and web versions).

Guided by the above perspectives, we conceptualize *information product*s as products whose core attributes *can be* digitized (represented, stored, retrieved, and transmitted as packets of zeros and ones) and *digitized information products* as those whose core attributes *are* represented, stored, retrieved, and transmitted as packets of zeros and ones. While digitized information products are amenable to being *distributed* via the Internet (e.g., software and music downloads; streaming of music and movies), this does not preclude their distribution via more traditional means (e.g., shrink-wrapped software copied on a CD and distributed through bricks-and-mortar and Internet retailers). Building on the foregoing overviews of first-mover advantage, the IME and information products, the next section presents a reassessment of extant perspectives on sources of first-mover advantage in the IME.

4 First-mover Advantage in the Internet-enabled Market Environment: Conceptual Framework and Propositions

Figure 2 presents a conceptual framework of first-mover advantage in the PME versus IME. Here, first-mover advantage (Box C) is viewed as resulting from the combined effect of the resources delineated in Box A. In literature on the resource-based view of the firm, competitive advantage of a firm is understood as a function of the combined value and rarity of all of a firm's resources and resource interactions (see Lavie 2006). Here, *resources* refers to all assets, capabilities, organizational processes, firm attributes, information, and knowledge controlled by a firm that enable it to conceive of and implement strategies that improve its efficiency and effectiveness (Barney 1991). A firm's strategic actions or behaviors (toward which expenditures are incurred) lead to the accumulation of specific skills and resources. In some of the published research on first-mover advantage, specific actions or behaviors (e.g., spatial preemption) per se of the first-mover are characterized as sources of competitive advantage. Rather, it is the *resources* that

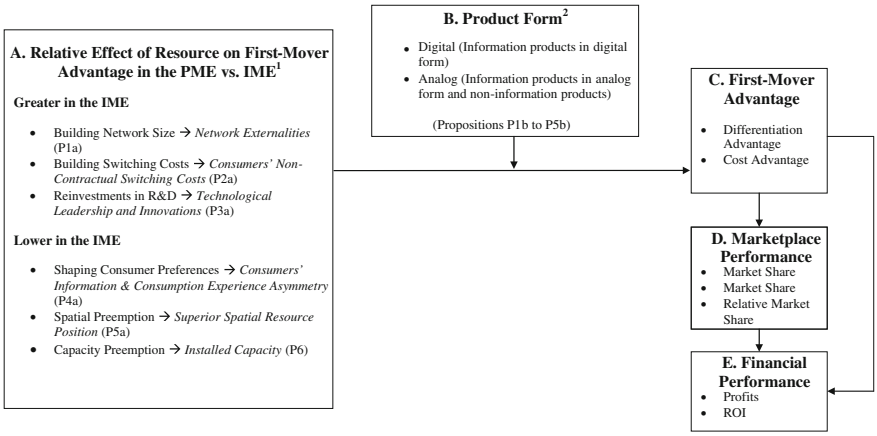

Fig. 2 First-mover advantage in the physical market environment (*PME*) versus the internet-enabled market environment (*IME*)

the first-mover accumulates as a consequence of engaging in specific actions that are the sources of competitive advantage. In turn, this facilitates the achievement of superior marketplace performance and financial performance (Boxes D and E in Fig. 2). Box B (digital versus analog) focuses on the moderating effect of product form. Specifically, whether the importance of a potential source of first-mover advantage in the IME is likely to be enhanced or diminished by the production and distribution of the focal product in digital form. Here, "digital" refers to information products in digital form (since only information products are amenable to digitization) and "analog" encompasses both information products in analog form and non-information products in analog form. In Table 1, we provide a list of strategic actions, the associated sources of first-mover advantage and the resulting propositions.

In each of the sections that follow, we first present conceptual arguments in support of the main propositions (P1a to P5a and P6) that focus on the relative effect of a resource on first-mover advantage in the PME versus IME. For some of these propositions, we provide a follow-up discussion drawing attention to the conditions under which a first-mover's strategic actions in the IME may not even translate into a first-mover advantage. As Teece (2006) argues, a first-mover's success in appropriating rents from its actions can vary considerably. Following each of the main propositions, we present conceptual arguments for a second set of propositions (P1b–P5b) focusing on the moderating effect of product form (digital versus analog). Furthermore, in the case of network externalities, to highlight the relevance of other contingencies, we also explore the moderating effect of a second variable (source of network externalities; see P1c). A more detailed discussion of the propositions and the underlying conceptual rationale follows.

Table 1 Strategic actions and sources of first-mover advantage

Strategic actions	Potential sources of first-mover advantage	Propositions
Building network size	*Network externalities*: the first-mover's network being perceived more favorably by present and potential customers due to its larger size relative to those of later entrants	P1a, P1b, P1c
Building switching costs	*Consumers' switching costs*: customers preferring to remain with first-mover due to costs they will be forced to incur if they choose to switch to another firm (contractual, non-contractual, and/or staggered switching costs)	P2a, P2b
Reinvestment of slack resources in R&D	*Technological leadership and innovations*: product, process, marketing, administrative and business model innovations	P3a, P3b
Investments in shaping consumer preference formation	*Consumers' information asymmetry*: consumers being more knowledgeable about the product offering of the first-mover compared to those of later entrants	P4a1, P4a2, P4b1, P4b2
	Consumers' consumption experience asymmetry: consumers satisfied with the performance of the first-mover's product offering choosing to remain loyal, to minimize risk	
Spatial preemption	*Spatial resource position:* the first-mover achieving a competitive advantage by preempting the most desirable spatial positions in the market, leading to entry deterrence and/or differentiation advantage(s)	P5a, P5b
Manufacturing capacity preemption	*Installed production output capacity*: the first-mover's installed production capacity acting as a deterrent to potential competitors entering the market (particularly under the scenario of the first-mover's installed production capacity being of the same order as the size of the market) or relegating followers to niche markets	P6

Note The focus of Table 1 is limited to strategic actions and resources whose effects on first-mover advantage in the PME versus IME, and moderated by product form (see Fig. 2 and propositions). A number of other strategic actions and corresponding sources of first-mover advantage are mentioned in the literature (see Lieberman and Montgomery 1988; Kerin et al. 1992)

4.1 Building Network Size → Network Externalities

Network externalities or *network effects* refer to a market exchange, industry standard, or product becoming increasingly valuable to its current and potential users as the installed base (i.e., size of the network) increases (Katz and Shapiro 1985; Frels et al. 2003). In general, the first-mover, by capitalizing on the opportunity to cultivate a large user base, before the entry of competitors, can

achieve a competitive differentiation advantage. That is, *ceteris paribus*, the first-mover's product offering will be viewed more favorably by current and potential users in light of the larger size of its network relative to those of its competitors.

The role of network externalities as a potential source of competitive advantage has been extensively explored in the literature (e.g., Betamax versus VHS format videocassette recorders (see Cusamano et al. 1992; Varadarajan 1999); Nintendo versus Sega videogame systems (see Shankar and Bayus 2003). *Direct network externalities* refer to the utility of a product to each user depending on the number of users of the product (e.g., telephones and fax machines). Products that are complementary to the focal product give rise to *indirect* or *complementary network externalities*. Competition between networks can exist at different levels such as: product (Word and WordPerfect), technology or industry standard (Windows and Mac Operating Systems), and market exchange (eBay and Yahoo! auctions). Network externalities can be product class/category-specific or firm-specific, depending on the compatibility of brands/standards in the market. They are firm-specific if each firm has a non-compatible technology platform as in the market for video games (e.g., Shankar and Bayus 2003). They can be product category-specific if there are multiple firms within each competing technology platform. For example, in the cell phone market, the offerings of some firms are based on the CDMA platform while those of some other firms are based on the GSM platform.

Regardless of whether the network context is the market exchange, industry standard, or a product, network externalities as a potential source of first-mover advantage is likely to be of greater importance in the IME compared to the PME. Consider, for instance, the case of competition between market exchanges (*market maker networks* that bring together buyers and sellers). Sellers are more likely to list their products in the market exchange with the most buyers; buyers are more likely to buy in the market exchange that has the most sellers. Due to the reinforcing effect of the propensity of buyers and sellers to gravitate toward the largest market exchange, the first-mover has an opportunity to leverage network externalities to its competitive advantage (Lieberman 2005). Traditional constraints such as physical space that limit the number of buyers and sellers who can congregate in a market exchange (e.g., a physical auction site) do not apply to an electronic market exchange (e.g., an electronic auction site). Also, while the distance that buyers and sellers may have to travel to congregate will affect the size of the network of physical market exchanges, this constraint does not apply to electronic market exchanges. Finally, unmediated (face-to-face) interaction between buyers and sellers, a characteristic of physical market exchanges, constrains the days and times when exchanges can occur in the physical marketplace. Electronic market exchanges allow spatially separated buyers and sellers to transact with significantly increased freedom of time and place. Consequently, compared with physical market exchanges, we expect network externalities to play a more influential role for building first-mover advantage in the context of electronic market exchanges.

Consider, next, competition between networks in the context of a product. Relative to the PME, the IME is more conducive for the first-mover to enhance

network utility (the benefits that current and potential customers of the product derive from network size) through the accumulation, dissemination and utilization (i.e., organizational responsiveness) of information about transactions and interactions within the boundaries of its network to which it has privileged access. *Privileged access*, in this context, refers to the ability of the first-mover to observe network behavior and capture information before later entrants. Privileged access to information about transactions and product-usage patterns can provide opportunities for identifying similar members, connecting new members to current members, and to strengthen and expand the network (see Thomson and Sinha 2008). To the extent that later entrants are at a disadvantage with regard to information access related to network members and network transactions in the IME, the first-mover is likely to maintain its competitive advantage. Therefore,

P1a: The effect of network externalities on first-mover advantage will be greater in the Internet-enabled market environment (IME) than in the physical market environment (PME).

Although, in general, the first-mover may have an opportunity to shape, influence, or establish the industry standards for a product to its advantage, certain caveats must be borne in mind. First, in certain instances, the industry standards might be set by a regulatory body. Second, rather than being set by either a regulatory body, the first-mover, or a dominant player in the industry, open industry standards might evolve over time as a consequence of the collective efforts of a community of users as evidenced by the movement toward open source in the software industry. Third, as pointed out by Srinivasan et al. (2004), if prospective customers were to adopt a "wait-and-see" attitude until uncertainties are resolved, the associated initial slow sales over a long period would provide a window of opportunity for later entrants. Fourth, in specific reference to indirect network effects, on the one hand, the relatively larger installed base of the first-mover, by attracting more developers of complementary and compatible products, can enhance the utility of the first-mover's product and speed adoption. On the other hand, if developers of complementary products were to adopt a wait-and-see posture, and defer committing to the first-mover's hardware platform until it has achieved significant market penetration, this could slow adoption of the first-mover's platform and offer a window of opportunity for later entrants (see: Srinivasan et al. 2004; Stremersch et al. 2007).

The implication of the first and second caveats is that under conditions of the first-mover not having an opportunity to shape, influence or determine the setting of the industry standards in its favor, the relationship between network effects and first-mover advantage will be weaker than otherwise. The third caveat also points to a condition under which the strength of the relationship between network effects and first-mover advantage will be weakened. The fourth caveat points to two alternative conditions under which the effect of network effects on first-mover advantage will be strengthened and weakened, respectively. However, it is important to note these caveats are applicable in both the PME and IME and are not unique to the IME.

4.1.1 Moderating Effect of Product Form

A number of considerations suggest that the effect of network externalities on first-mover advantage is likely to be greater for information products in digital form in the IME than for information products in analog form and for non-information products. First, typically, a consumer's use of certain information products in digital form is strongly driven by how many others use the product (e.g., Adobe's PDF, portable document file, format). Second, information products in digital form are more useful with accessories than without them (e.g., the value of a PDF writer increases when a compatible document reader is widely available). Third, information products in digital form can be produced and distributed fast, allowing quick realization of the benefits of network (for example, a picture taken by one user on a cell phone can be transmitted instantaneously to several others). Fourth, as a number of information products in digital form (e.g., word processing, presentation, and spreadsheet software) are characterized by low consumer demand for variety, a first-mover's network of users may be difficult to breach. Relative to the size and scope of the network for information products in the PME, the potential size and scope of the network for information products in digital form in the IME is greater. Therefore,

P1b: The greater effect of network externalities on first-mover advantage in the IME relative to the PME will be more pronounced for information products in digital form than for information products in analog form and for non-information products.

4.1.2 Moderating Effect of Source of Network Externalities

The size of the effect of network externalities on first-mover advantage could differ by the strength of the network as derived from the source of network externalities—technological compatibility versus social group accessibility (Shankar and Bayus 2003). Customers of certain goods and services, such as telecommunications and extranet networks, derive instant network externality-based benefits if the goods or services used by other customers and prospects are technologically compatible. In the IME, because the ability to be connected to customers and prospects can be instantaneous and real time, such technology-enabled benefits could result in the rapid development of a strong user base than in a PME. If customers, however, predominantly derive network externality benefits from having access to a social group, the potential first-mover advantage for a firm in the IME may be smaller. Unlike in the case of technological compatibility, where instant transactional benefit leads to accelerated growth of the installed base, in the case of social group accessibility, the customer benefits and the growth of an user network may realize at a slower pace in the IME. These arguments lead to the following proposition (not shown in Fig. 2).

P1c: The greater effect of network externalities on first-mover advantage in the IME relative to the PME will be more pronounced for technology compatibility than for social group accessibility as the source of network externalities.

4.2 Building Switching Costs → Consumers' Non-contractual Switching Costs

Burnham et al. (2003, p. 110) define switching costs as "one time costs that customers associate with the process of switching from one provider to another." *Non-contractual switching costs* refers to the costs that a consumer will incur when switching in a non-contractual setting—one in which the customer is not bound by a contract with the seller. Extant literature provides insights into the effect of switching costs on first-mover advantage (Robinson 1988; Makadok 1998). For instance, Makadok reports that first-movers in the mutual fund industry are able to enjoy a moderately sustainable market share advantage by creating non-contractual switching costs. The typology of switching costs delineated in Burnham et al. (2003)—procedural (economic risk, evaluation, set up and learning costs), financial (benefit loss and monetary loss costs) and relational (personal relationship loss and brand relationship loss costs)—provide additional insights into the nature and scope of non-contractual switching costs.

Relative to the PME, the ease of switching in the IME highlights the importance of building non-contractual switching costs. At the same time, however, the IME offers firms additional opportunities to nurture customer loyalty. Case in point is the opportunity available to the first-mover to achieve a competitive advantage by investing in sticky features to build non-contractual switching costs. In the IME, a first-mover, by investing in sticky features such as personalization tools that customers perceive as providing valuable benefits, can lock in customers—increase the likelihood of their visiting its website, frequency of visit, duration of visit, and average purchase volume during each visit (see Johnson et al. 2003; Hauser et al. 2009; Manchanda et al. 2006). From the insights gleaned by analyzing information related to the above, a first-mover can develop a superior understanding of the evolving needs and preferences of customers, and utilize this insight to customize its product offerings. Also, relative to the PME, customization efforts in the IME can be significantly enhanced by personalizing information and the interactive experience. Furthermore, since personalization tools generally improve with the accumulation of transaction history, the ability of first-movers to glean valuable customer insights from accumulated transaction history over a longer period of time may enable them to retain the superiority of their efforts compared with followers. For example, Netflix's recommendation system and other personalization tools are widely viewed as a source of competitive differentiation advantage in the online movie rental industry. Therefore,

P2a: The effect of consumers' non-contractual switching costs on first-mover advantage will be greater in the IME than in the PME.

In the absence of reassurance that customers often derive from being able to touch, feel, and see products, and visit the seller's physical location, a strong brand name as a source of non-contractual switching cost is likely to be of greater importance in an IME compared to a PME. Indeed, brand image is significantly related to behavioral intentions in online environments (Bart et al. 2005). Therefore, in the IME, it may be more critical for the first-mover to engage in brand building efforts. However, in the absence of a legacy in the PME to build on, brand building efforts to develop non-contractual switching costs in the IME (e.g., a pure play Internet retailer) could be a costly endeavor.

4.2.1 Moderating Effect of Product Form

A number of information products in digital form are characterized by non-contractual switching costs. For instance, a consumer familiar with the use of the first-mover's word-processing, presentation, or spreadsheet software, would incur non-contractual switching costs by switching to a later entrant's software. The costs include the time and effort that must be expended in learning to use the new software. Compatibility factors might lead to incurring additional non-contractual switching costs on hardware. Furthermore, for information products in digital form characterized by low demand for variety, consumers' concerns over incurring non-monetary, non-contractual switching costs are likely to be higher. Therefore,

P2b: The greater effect of consumers' non-contractual switching costs on first-mover advantage in the IME relative to the PME will be more pronounced for information products in digital form than for information products in analog form and for non-information products.

4.3 Reinvestments in R&D → Technological Leadership and Innovations

Innovations can be potential sources of first-mover advantage to the extent that patents and proprietary learning are deterrents to their appropriation by competitors (Banbury and Mitchell 1995) in both the PME and the IME. In the IME, recent developments relating to a number of marketing process innovations (e.g., Amazon.com's purchase facilitation with its one-click feature), and business process or model innovations (e.g., Priceline.com's business model) provide valuable insights into their patentability versus appropriability.

Organizational slack refers to resources in excess of those required to produce a given output (Nohria and Gulati 1996). Resources generated by superior performance may become slack resources readily available to managers within the

organization (Cyert and March 1963) to experiment and learn (Levinthal and March 1993). Until such time competitors enter the market, the first-mover will be in a position to command high profit margins. Even after the entry of competitors, to the extent that consumers' perception of the risk of buying from the first-mover is lower than for later entrants, consumers may be willing to pay a higher price for the product offerings of the former (Robinson and Fornell 1985; Urban et al. 1986). This line of reasoning suggests that, all else being equal, the first-mover would be better endowed with slack resources to reinvest in R&D to sustain a superior position in technological leadership and innovations (product, process, marketing, administrative and business model innovations). For instance, Robinson and Chiang (2002) note that first-movers are more likely to engage in product development on an ongoing basis than later entrants.

However, it should be noted that during the mid to late 1990s, organizational slack had very little to do with venture funding of numerous Internet start-ups. Billions of dollars of venture capital were invested in start-ups, many with questionable claims (in retrospect) of first-mover advantage. Numerous successful Internet start-ups (both first-movers and early entrants) often incurred losses for several years before becoming profitable. For these firms, the source of financial resources for continued investments in R&D to sustain a superior position in technological leadership and innovations was either additional infusion of funds by venture capital firms or going public, rather than slack resources. The above caveats notwithstanding, given the dynamic nature of the IMEs, and the faster rate of change, it is particularly important for first-movers to continuously innovate in multi-faceted ways to remain on top. In contrast, in the PME, the competitive advantage to the first-mover often comes from lowering costs by doing "more of the same" and achieving economies of scale across the value chain. Therefore,

P3a: The effect of technological leadership and innovations on first-mover advantage will be greater in the IME than in the PME.

4.3.1 Moderating Effect of Product Form

Information products in digital form can be redefined through incremental innovations to add customer value more easily and quickly than can information products in analog form. For example, the value of an information product in digital form such as Adobe's PDF Reader software can be readily enhanced to include editing features by enabling a software code. Such enhancements allow the first-mover of an information product in digital form to innovate in the way it prices, sells, and organizes its product design, product support, and sales teams more nimbly than would be possible for information products in analog form. Google's rapid rise to prominence is attributed, at least partly, to its growing number of new online services that leverage Google's core online search engine technology. Therefore,

P3b: The greater effect of incremental innovations on first-mover advantage in the IME relative to the PME will be more pronounced for information products in

digital form than for information products in analog form and for non-information products.

The limited scope of P3b (to the moderating influence of product form on the effect of incremental innovations on first-mover advantage) stems from the absence of an a priori basis to advance propositions in the context of innovation in other realms.

4.4 Investments in Consumer Preference Formation → Consumers' Information Asymmetry and Consumption Experience Asymmetry

The effect of *consumers' information asymmetry* (consumers being more knowledgeable about the product offering of the first-mover compared with those of later entrants) and *consumption-experience asymmetry* (consumers possessing a greater amount of consumption experience with the first-mover's product compared with those of later entrants) on first-mover advantage have been highlighted in extant literature (Kerin et al. 1992). In general, under conditions of imperfect information about product quality, consumers tend to remain loyal to the first brand they encounter that performs satisfactorily. Even consumers entering the market for the first time, and confronted with the task of evaluating competitive offerings, are likely to seek ways of economizing on product information search and evaluation costs. One approach that first-time buyers may use to economize on evaluation costs is free ride on the presumed analysis of better informed consumers by buying the leading brand. Often the leading brand may be the one that has been available in the market for the longest time (Lieberman and Montgomery 1988). It has been shown that the manner in which consumers learn about alternative brands in the marketplace can create a memory and preference structure that favors the first-mover (Carpenter and Nakamoto 1989; Kardes and Kalyanaram 1993). Similarly, Boulding and Christen (2003) find that the first-mover generally benefits from factors that result in a lack of consumer learning in the marketplace.

The competitive advantage that a first-mover enjoys in the PME due to repeat and first-time buyers economizing on product-information search and evaluation costs is likely to be less pronounced in the IME. Although search and evaluation in the IME would inevitably entail certain non-monetary costs (e.g., time), the requisite product-related information is often available at no monetary cost. In addition to instant access to information, the information infrastructure of the IME and its distinctive features such as recommendation agents vastly increases one's ability to store, retrieve, sort, filter, and distill information. Such capabilities greatly enhance the realized value of the underlying information and facilitate more effective comparisons across firms and their respective products. Indeed, consumers' ability to readily conduct such comparisons may account for the

shortened duration of first-mover advantages reported in Nikolaeva's (2007) study of 460 online retailers.

The role of brand building in the creation of information asymmetry to sustain first-mover advantage is particularly relevant. Brands are intangible assets that firms can use to create competitive advantage. When brand importance is high in a market, the first-mover can create information asymmetry relative to the brand offerings of late movers by investing in brand building efforts and enhancing its brand equity. Furthermore, when the offerings in a market are fairly undifferentiated, brand equity can provide a source of advantage for the first-mover. The advantage a first-mover accrues through these actions will likely be lower in the IME than in the PME due to lower information search costs for consumers and lower information dissemination costs for the late mover (the cost of drawing potential customers' attention to the superiority of its product offering relative to that of the first-mover). It is possible that due to the absence of an opportunity to touch and feel products in the IME, the value of favorable consumption experience outcome with the first-mover can be greater than in the PME (see Peck and Childers 2003). In the aggregate, however, the net effect of other factors discussed above suggests the following propositions.

P4a1: The effect of consumers' information asymmetry on first-mover advantage will be lower in the IME than in the PME.

P4a2: The effect of consumers' consumption experience asymmetry on first-mover advantage will be lower in the IME than in the PME.

4.4.1 Moderating Effect of Product Form

In general, the cost that a late entrant would incur in promoting trial and sampling of an information product in digital form will be considerably lower than the cost of promoting trial and sampling of an information product in analog form. Consider, for instance, an information product in digital form such as income tax preparation software. Here, the marginal cost that a late entrant would incur in order to allow prospective customers to try its product in digital form for free would be very low—tending towards zero. For instance, the late entrant can allow prospective buyers to use the income tax preparation software in the IME by accessing its web site to prepare their annual tax returns, and only if completely satisfied with the experience, require them to pay for consuming the product (i.e., prior to printing and/or electronically transmitting the completed tax return). In the online retailing context, evidence suggests that first-movers of products with more digital characteristics do not enjoy any advantage beyond the initial years (Nikolaeva 2007). Therefore,

P4b1: The diminished effect of consumers' information asymmetry on first-mover advantage in the IME relative to the PME will be more pronounced for information products in digital form than for information products in analog form and for non-information products.

P4b2: The diminished effect of consumers' consumption experience asymmetry on first-mover advantage in the IME relative to the PME will be more pronounced for information products in digital form than for information products in analog form and for non-information products.

4.5 Spatial Preemption → Spatial Resource Position

Spatial resource positions resulting from preemption of the most attractive physical spaces in the PME can be a source of competitive advantage for the first-mover. By preempting the most attractive locations in the physical space and/or the perceptual space (i.e., positioning in the perceptual space), the first-mover can achieve a competitive differentiation advantage. In certain instances, spatial preemption may also enable a first-mover to achieve a competitive cost advantage. For instance, during the 1970s, banks began to offer ATMs as an alternative to interfacing with human tellers for processing financial transactions. A prescient first-mover would have had the opportunity to acquire or lease prime real estate for placing ATMs at prices below those that would prevail later in the evolution of the market. As the market for a resource such as strategic locations for placing ATMs became competitive, the price of the resource would have been bid up until it was equal to the future above-normal benefits that can derived from the resource (see Barney 1986; Bharadwaj et al. 1993).

In the IME, a firm may be able to achieve a short-term competitive differentiation advantage through preemption of the most attractive domain name and electronic storefront. For instance, information search engines and portals (e.g., Google, Yahoo!, and Microsoft's MSN) that serve as gateways for accessing the websites of businesses in various product categories, differ in their relative market standing and attractiveness (e.g., number of subscribers, unique visitors, frequency of visits, and transaction volume per visit). A firm, through preemptive placement on a more attractive portal (e.g., an agreement for an exclusive listing in a particular product category), may be able to achieve a competitive differentiation advantage. However, as the supply of online space is considerably less restricted than that of physical spaces, the resulting competitive advantage is likely to be short-lived.

In the IME, firms can possibly create entry barriers and spatially preempt competitors by judiciously using both the online and offline spaces, primarily the online space. In an analytical model of competition between a direct marketer and traditional retailers, Balasubramanian (1998) shows that a direct marketer can act as a competitive wedge between retail stores and make spatial advantages less relevant strategically. Furthermore, using both analytical and empirical models, Pan et al. (2002) show that, in equilibrium, multichannel retailers have higher prices than Internet retailers, suggesting that in the IME, spatial preemption cannot provide a price premium advantage. These results suggest that, in general, the likelihood of favorable outcomes from spatial preemption will be smaller in the

IME than in the PME (for a similar conclusion, see also: Cattani et al. 2006; Liu et al. 2006). Therefore,

P5a: The effect of spatial resource position on first-mover advantage will be lower in the IME than in the PME.

4.5.1 Moderating Effect of Product Form

For physical products, the likelihood of later entrants being locked out of specific channels, due to shelf space constraints, is greater for products that are bulky (e.g., disposable diapers). Unlike physical products, digitized information products do not take up any physical space. Once the requisite infrastructure has been created, fulfillment activities pertaining to storage, product handling, and distribution can be automated and performed quite efficiently (see Anderson and Anderson 2002). It is possible that the number of slots available for *preferred placement* that might be available on the opening web page in an electronic marketplace setting such as a search engine, information portal or shopping portal may be limited. Nevertheless, it is less likely that a digitized information product would be locked out of the electronic marketplace simply due to space constraints. Therefore,

P5b: The diminished effect of spatial resource position on first-mover advantage in the IME relative to the PME will be more pronounced for information products in digital form than for information products in analog form and for non-information products.

4.6 Capacity Preemption → Installed Capacity

Under certain conditions, the first-mover's installed production (output) capacity can be a credible deterrent to the entry of new competitors. A concept pertinent in this context is the *minimum efficient scale* of production (MES), "the smallest volume for which the unit cost reaches a minimum" (Oster 1994, p. 59). When the installed production capacity of the first-mover, MES, and the size of the market (S) are all of the same order of magnitude, installed production capacity can be a credible deterrent to the entry of new competitors. The IME significantly extends the geographic reach of firms because it bestows on competing firms a greater ability to market their offerings to prospective buyers farther from their principal base of operation (e.g., from national to global). In effect, competitors' assessments of market size and market potential are likely to be based on a significantly larger, more global market area. Holding MES constant, the increase in S implies that multiple firms can coexist in an industry. Therefore, the importance of installed production capacity of the first-mover as an entry deterrent will diminish in the IME.

The role of computer server capacity and information technology capacity in potentially creating an entry barrier, and a possible first-mover advantage in the

IME, also merit assessment. In the IME, investments in server capacity will enable a firm to offer a wide selection of products, vast amounts of information, and a high level of customer service on its web site. However, investing in computer server capacity to serve a large market is unlikely to result in the first-mover being able to erect a deterrent to entry by late movers. Unlike investments in manufacturing capacity that can result in scale economy advantages, investments in computer server capacity are unlikely to yield similar advantages to the first-mover. Investments in server capacity and information technology are typically non-proprietary, freely available to all competitors and characterized by low asset specificity. Hence, such investments are not a strong deterrent to entry by late movers. Fudenberg and Tirole's (1984) game theoretic analysis of over- and underinvestment in manufacturing capacity strategies by an incumbent firm also points to the lack of deterrence provided by such investments. Therefore,

P6: The effect of installed capacity on first-mover advantage will be lower in the IME than in the PME.

While P6 is advanced under conditions of "holding MES constant," it should be recognized that long-term technological advances can lead to significantly lower MES. However, in the short-term, our assumption of MES being constant is reasonable. Also, as Kerin et al. (1992) note, the installed capacity of the first-mover is likely to be a source of competitive advantage only under conditions of low demand uncertainty. The rationale being, under conditions of high demand uncertainty, the first-mover is less likely to make sizeable investments in manufacturing capacity to deter new entrants.

4.6.1 Moderating Effect of Product Form

While the number of units of an information product that can be produced in analog form may be constrained by natural limits (manufacturing capacity constraints), there are no natural limits to the production of additional units (copies) of information products in digital form (see Shapiro and Varian 1999). In other words, for information products in digital form, installed production capacity is not a meaningful concept. Hence, the concept of installed production capacity as an entry deterrent and potential source of first-mover advantage is not applicable in the context of information products in digital form in the IME.

5 Discussion

5.1 Implications for Marketing Practice

The critical reassessment of the extendibility of extant perspectives on first-mover advantage to the IME and to information products in digital form presented here can be valuable to managers in: (1) developing a better understanding of issues

pertaining to first-mover advantage in the IME; (2) nurturing resources that are important from the standpoint of achieving competitive advantage in the IME, in particular, for digitized information products; and (3) focusing on developing competencies that might be critical for being successful in the IME and the development and marketing of information products in digital form. As argued in the previous section, given that the effects of certain sources of first-mover advantage explicated in extant literature are likely to diminish in the IME, sources whose effects are likely to be more pronounced in the IME (network externalities, non-contractual switching costs, and technological leadership and innovations) have important implications for marketing practice. A brief discussion follows.

5.1.1 Get Close to Customers Fast: Invest in Building Network Size Rapidly in the IME

The proposition concerning the greater effect of network externalities on first-mover advantage in the IME than in the PME (P1a) highlights the importance of proactive efforts by the first-mover to build the size of the network (i.e., getting close to customers fast). Although many avenues are available to firms for rapidly building network size, privileged access to information about transaction and communication patterns in the network can play a significant role in this endeavor. Having exclusive access to this information can provide opportunities for identifying clusters of network members that have (1) similar needs, (2) an interest in interacting with each other, and/or (3) a potential for creating other synergistic advantages for the overall network. For example, in the initial years of online exchanges, eBay was quick to expand its network of buyers and sellers by letting them create a powerful value system in the form of a socially acceptable rating system. Similarly, Linkedin, a social network for professionals, has grown by providing its members tools to recruit other members and then integrate them into the network.

5.1.2 Retain Customers Through Continual Multi-faceted Innovations

The proposition relating to the greater effect of technological leadership and innovation on first-mover advantage in the IME than in the PME (P3a) highlights the importance of making ongoing investments in product, process, and business model innovations to create and deliver value to customers. In specific reference to product-markets characterized by network externalities, through proactive development of value-added products and experiences for current and prospective network members, and thereby enhancing network utility, the first-mover can offer compelling reasons for customers to remain with its network. It is important for the first-mover to recognize that in the IME, only through ongoing investments in innovations and enhancing the network's utility to users can it sustain the advantage associated with network size. The need for such innovations is crucial,

but is often overlooked by those who advocate the strategic benefits of being first in the IME by solely invoking the network effects rationale. As pointed out by Schilling (2002), in addition to a firm's entry timing and installed base of users, its learning orientation also contributes to its success. In the absence of a learning orientation, a late entrant may be able to overtake the first-mover by creating a stronger network through offerings that provide greater utility to users (Shankar and Bayus 2003; Srinivasan et al. 2004). However, in the IME, the first-mover has an opportunity to learn faster and preempt such strategic moves by later entrants than in the PME. As noted earlier, a prescient first-mover has the opportunity to leverage privileged access to information within its network to offer more precise and useful personalization and recommendations to its members. Later entrants may not be able to match this in the short-run due to the elapsed time between when they are able to observe network behavior and capture information, relative to the first-mover.

There are many successful examples of the adoption of such an approach. Google represents an example of a firm that continually innovates its value proposition to its customers (advertisers) by constantly refining and improving its paid search advertising model. It started with text search advertising, moved to video search advertising through its subsidiary YouTube, and then developed or acquired capabilities to broker ad placement across a broader spectrum of online properties (e.g., through its acquisition of DoubleClick). With its iGoogle initiative, the firm offered an extensive range of personalized information services that it could leverage for strengthening relationships with users of its search engine and for placing advertising. There are also examples of failures of firms that did not adopt such an approach. One such example is Prodigy, the first-mover in the online services space. In the absence of continuous innovation, it was eclipsed by a later entrant such as AOL which steadily added a stream of incrementally innovative features. Of course, AOL itself subsequently faced a host of challenges that stemmed, at least partly, from lackluster innovations. The precipitous decline of MySpace, in contrast with Facebook's meteoric rise, presents a similar cautionary tale.

5.1.3 Leverage Sticky Features of the IME to Create Non-contractual Switching Costs

The proposition concerning the greater effect of consumers' non-contractual switching costs on first-mover advantage in the IME than in the PME (P2a) suggests that a first-mover, by leveraging the sticky features of its website and the Internet to enable customers to manage their interactions with the firm with greater ease (at lower non-monetary costs), can create non-contractual switching costs in the IME. The first-mover can build on the switching costs by innovating in such a manner that its customers can effortlessly switch to the next generation of its own innovative products, relative to other competitive product offerings. Customer loyalty for services chosen online is greater than that for services selected offline, primarily due to the sticky features in the IME (Shankar et al. 2003).

Some first movers have successfully used the IME's sticky features to increase switching costs and enjoy an advantage. For example, Amazon's one-click ordering system is a sticky feature that initially helped to lock-in its customers by simplifying order placement. Similarly, Netflix, the first-mover in the online DVD rental market, by leveraging information on the movie renting patterns and preferences of customers, developed a sticky interface, namely offering personalized movie recommendations. eBay's reputation system based on seller- and buyer-provided ratings is widely recognized as a sticky feature that has made it difficult for other online auction firms to mount a serious competitive challenge.

6 Implications for Future Research

6.1 Empirical Testing

Empirical testing of the propositions advanced here constitutes a logical avenue for future research. Two approaches to empirically test the propositions are possible. One approach is to elicit managers' perceptions and beliefs pertaining to first-mover advantages in the IME relative to the PME. Such an approach is consistent with Bolton (2006) and Song et al. (1999) and is reasonable given that digitization in both the market environment and product environment is still evolving, and objective marketplace data are often difficult to obtain due to their proprietary nature.

In this approach, using a survey, managers could be asked to report whether the effect of a specific strategic action (e.g., network building efforts) on first-mover advantage would be more pronounced, less pronounced, or remain invariant in the IME relative to the PME. Alternatively, an experimental scenario-based approach could be used to create hypothetical competitive environments that varied systematically along two factors: market type (PME versus IME) and the first-mover's strategic action (e.g., relative emphases on marketing programs with the potential to create non-contractual switching costs for customers). Experienced managers can be asked to study the scenarios and indicate the likely relative performance outcomes for the first-mover (e.g., market share and return on investment) under different experimental conditions.

In reference to managers' perceptions and beliefs, the propositions can be tested as stated with the first-mover's competitive advantage as the outcome variable. However, extant research on first-mover advantage has largely focused on *identifiable* and *measurable variables* such as order of entry, market share, market share rank, financial performance and survival rate. All else being equal, competitive cost and/or differentiation advantage can be expected to result in superior marketplace and financial performance.

A second possible approach to test the propositions is a cross-sectional study of a balanced set of markets in both the IME and the PME. This approach would

involve a combination of both hard data on variables such as sales, market share, installed customer base, profits of firms, and survey data on variables such as switching costs and consumers' information and consumption experience asymmetry. For example, firm resources can be measured by hard data on variables such as assets, net income, and goodwill, while consumer information asymmetry can be captured by variables such as awareness of brands collected through survey data. The propositions can be tested by linear and log-linear regression models linking the appropriate variables in the propositions. Typically, a regression model would be adequate to test most propositions. However, for propositions involving spatial preemption arguments, a multidimensional perceptual mapping analysis of competitors together with a regression model would be most appropriate. Although such an empirical approach may not involve a comprehensive structural model, it would be useful to explore the face validity of the propositions.

6.2 Other Future Research Issues

The proposed conceptual framework (Fig. 2) and propositions focus on how the effects of specific resources of first-mover advantage are likely to be moderated by product form. A potential avenue for further conceptual enhancement as well as future empirical research is to explore the moderating influences of other contextual variables. In reference to the link between first-mover advantage and the resource-based view of the firm, Lieberman and Montgomery (1998) highlight the importance of both the *opportunities* available to early entrants to preempt potential sources of competitive advantage and *heterogeneity* in the ability of firms to identify and exploit potential sources of competitive advantage. In this chapter, we focused on the opportunities available to the first-mover to preempt potential sources of competitive advantage. Addressing heterogeneity in the ability of firms to identify and exploit potential opportunities for achieving a first-mover advantage constitutes another potential direction for future research and enhancement of the proposed conceptual model.

Finally, the extent to which extant perspectives on late-mover advantages developed in the context of the PME extend to the IME represents another potential avenue for future research. Potential late-mover advantages include economies of scope, innovation, improvements in alignable attributes, consumers' variety-seeking behavior, learning from the first-mover's mistakes, first-mover's cost disadvantages, and the scope and speed of international market entry (see, e.g., Golder and Tellis 1993; Shankar et al 1999). An examination of these and other mechanisms available to late movers to neutralize the competitive advantages of the first-mover in Internet-enabled environments represents a promising area for future research.

7 Conclusion

Extant literature offers conflicting views on first-mover advantage in the IME, ranging from an assertion that it is automatically bestowed to a complete dismissal of its relevance. The frenzied entry behavior of start-ups observed in the IME during the mid to late 1990s was, at least to some extent, fueled by the desire to be a first-mover under the misguided belief that it would automatically lead to a sustainable competitive advantage. It is also conceivable that metaphorical comparisons of developments in the electronic marketplace with nineteenth century events such as the "gold rush" and "land grab" may have contributed to entrepreneurial efforts to be simply first in the IME in specific product categories. However, the meteoric rise—and the equally dramatic fall—of a large number of first-to-market firms in the IME raised serious questions about specific strategic actions through which prescient first-movers can successfully achieve a competitive advantage in the IME. In some markets in the IME, first movers, nevertheless, have managed to maintain their market share leads over their competitors.

Against this backdrop, our conceptual analysis of the extendibility of extant perspectives on first-mover advantage makes an important contribution to the literature on first-mover advantage. Our analysis suggests that sources such as network externalities, consumers' non-contractual switching costs, and technological leadership and innovations assume greater importance in the IME than in the PME. In contrast, sources such as consumer choice under information and consumption experience asymmetry, spatial resource positions, and installed capacity play a diminished role in the IME than in the PME.

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Can Online Retailers Escape the Law of One Price?

Francesco D. Sandulli and José Ignacio López-Sánchez

Abstract Early academic research on electronic markets suggested that there are forces driving these markets towards the Bertrand equilibrium where firms set prices equal to unit cost. However, more recent empirical evidence shows that online retailers have been able to develop a number of strategies to escape the Law of one price. This chapter reviews the economic and marketing literature to analyze the strategies that may allow retailers to set prices above marginal costs in Internet markets. More specifically this chapter describes how online retailers use marketing, operations, distribution and communication strategies to avoid perfect competition equilibrium.

Keywords Electronic markets · Bertrand model · Frictional costs · Price dispersion

1 Introduction

Although the U.S. market is still dealing with the ongoing fallout from the financial crisis, U.S. retail e-commerce sales grew 50 % over the last five years, reaching a total of over $220 billion in sales in 2012 according to U.S. Census Bureau data. During the same period U.S. offline retail sales grew only 6 %. This trend appears to indicate that the Internet is more efficient than traditional retail channels, as it continues to pull consumers away from malls, shops and other retail channels. The explosive growth of Internet retailing has produced a growing body of research on the differences between online and offline retail channels.

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One of the most studied distinctions between electronic retailing and conventional retailing concerns price strategies. The classic Bertrand model of price competition suggests that undifferentiated retailers selling homogeneous goods in markets with perfectly informed buyers will charge prices equal to marginal cost and will not earn any profit. This is known as the law of one price. On the flip side, retailers will make some profit in Internet markets if they follow differentiation strategies, consumers are not perfectly informed about the supply and if products are not homogeneous.

The literature on price dispersion on the Internet has primarily focused on measuring the size and time variability of price dispersion. While this literature has confirmed the existence of persistent price dispersion on the Internet, retailers must understand the causes of this phenomenon to deploy effective strategies to compete in online markets. While the violation of the Bertrand model and higher prices in Internet markets may be not a desirable outcome for consumers, sellers are interested in keeping prices high and will deploy different strategies to keep prices above marginal costs. This chapter studies different strategies that retailers may adopt to escape the law of one price. These strategies will be classified in three groups following the three main assumptions of the Bertrand model. The chapter will begin with a discussion of online sellers' strategies to increase information, followed by an analysis of online sellers' differentiation strategies and lastly, an exploration of the relationship between product heterogeneity and online prices.

Although recent research has provided some explanations why Bertrand model assumptions are violated on the Internet, most of the literature on this topic provides only partial explanations of the phenomenon, or studies only a specific violation of the Bertrand model. The range of existing approaches reflects the plethora of search models, market structure assumptions, market contexts, and the wide array of questions within the field of price competition on the Internet. However, modeling price competition, by definition, entails ignoring factors that are not significant in certain markets or for some of the Bertrand assumptions, but it is precisely these factors that may become key in other settings or markets. To overcome this paradox of studying price competition on the Internet, this chapter will integrate monocausal explanations and paradigms by systematically identifying a coordinate system of drivers in which the scope of existing online price dispersion theories can be delineated. This integrated approach will form the basis for developing the theory and moving towards a unifying framework. To achieve this goal, this chapter will review the literature on price competition in electronic markets to understand how online sellers will benefit from persistent higher prices and why the Internet does not provide the expected informational efficiency gains to consumers. The chapter aims to contribute to the theoretical literature by reviewing the impact of online price competition on retailers' competitive strategies and outline future research directions. The next section studies how online retailers deal with information costs. The third section describes online retailers' differentiation strategies, and the fourth section addresses online retailers' strategies with heterogeneous products. The final section outlines the main conclusions and future lines of research.

2 Information Costs and Price Competition on the Internet

Neoclassical economics suggest that price competition occurs because consumers are not perfectly aware of the prices and qualities of all products sold in a market (Stigler 1961). Consumers can not know all the prices quoted by different sellers at any given time, and any agent who wishes to ascertain the lowest price must conduct a search that involves costs, called information costs. Buyers actively collect product information to make potentially better purchase decisions. Consumers will search for product information until the marginal cost of obtaining a unit of information is equal to the marginal benefit of possessing this information. Consequently, both search costs and search benefits will define the search strategies of online consumers (Varian 1980; Schmidt and Spreng 1996).

Theoretically, the most important contribution of the Internet to markets' efficiency is the reduction of information costs. It would seem obvious that, at least for certain types of products, consumers can discover prices and product characteristics from competing suppliers much more easily in online markets than in offline markets. One of the first papers to explore information costs in electronic markets (Bakos 1997), suggests that information and communication technologies reduce information costs. According to Bakos (1997), if product offerings are poorly differentiated and consumers can easily find price information, buyers in electronic markets will be closer to the Walrasian scenario of individuals who are fully informed about prices. Full information about prices and products will trigger price competition among sellers, reducing price dispersion and shifting the balance of power to consumers. Despite some theoretical weaknesses of this assumption (Harrington 2001), and despite the amount of contradicting evidence, the common assumption that electronic markets reduce price dispersion is not completely wrong. Recent empirical evidence supports price dispersion reduction. Tang et al. (2010) show that as Internet shopbot usage increases, prices of books decrease and price dispersion decreases nonlinearly. While most of the empirical evidence on price competition in online markets is based on the observation of posted prices, recent research considering actual transaction prices reinforce the initial theoretical assumption that electronic markets reduce average prices and increase information transparency (Ghose and Yao 2011; Ong and Zhong 2011; Sengupta and Wiggins 2012). The differences in terms of price competition between posted and actual transaction data reflect the fact that outliers' prices distort the results. When using posted prices to measure price competition, lower prices may not be honored by retailers and higher prices may not generate any sales (Brynjolfsson and Smith 2000; Pan et al. 2004; Ghose and Yao 2011). Nevertheless, as we will discuss below, low or high posted prices may not be simple statistical outliers but also the result either of sellers' strategies to artificially increase information costs (Ellison and Ellison 2009) or of manufacturers' or retailers' multichannel pricing strategies (Carlton and Chevalier 2001).

Nevertheless, the body of research that shows that online purchasing is not as efficient as expected is large and for certain products still confirms that Internet

markets violate the assumptions of the law of one price. Under this assumption, the literature has revealed online retailers may benefit from high information costs. Therefore, online sellers should adopt price discrimination strategies and exploit consumers' heterogeneous information costs. Online retailers may follow different strategies to increase consumers' information costs. First, they may define prices according to frictional costs, the costs of using the Internet technology to search for product and prices (Hann and Terwiesch 2003; Brynjolfsson et al. 2010). Second, online retailers may obfuscate product and price information. Finally, online retailers should take also into account how market entry strategies will impact price competition. These three approaches will be discussed in the following sections.

2.1 Frictional Costs and Competition on the Internet

The model of search costs in a clearinghouse setting established by Varian (1980) is one of the most common models to explain Internet consumer behavior. According to this model, prices depend on the number of consumers who will use the Internet to search for products and prices. Internet intermediaries such as shopbots may play a significant role in reducing price dispersion and empowering consumers. However, Internet shopping is not frictionless. In Internet markets, consumers incur certain frictional costs such as access costs, learning costs and waiting costs (Baye and Morgan 2001; Hann and Terwiesch 2003). Varian model predicts that larger frictional costs will decrease price competition as fewer consumers will benefit from lower information costs. In cases where there are low levels of Internet and shopbot adoption, sellers benefit from information rents and price competition will be less intense. Over time, as more consumers become familiar with Internet technologies and intermediaries, price competition will intensify and prices will fall and get closer to marginal costs. Ward and Lee (2000) show that as consumers become more experienced with Internet shopping, both brand reliance and prices fall as consumers intensify product information searches. Brown and Goolsbee (2002) confirm the role of Internet access and learning effects on price competition. This research shows that the initial introduction of the Internet search sites was initially associated with an increase in prices for term life insurance. However, as Internet usage spread, average prices and price dispersion fell. Furthermore, this research shows that regions with higher Internet penetration undergo a faster reduction in online prices. Brynjolfsson et al. (2011) provide empirical evidence of the impact of this learning effect on prices, as they show that purchases made by consumers with prior Internet experience, and thereby lower learning costs, are more skewed toward niche products. Hann and Terwiesch (2003) observe that higher experience is negatively related to price offered by consumers in "name your own price" sites.

Nowadays, Internet access and the learning effects have a weaker impact on online price competition in developed countries, but it is still a relevant factor

when competing online in developing countries. Bock et al. (2007) show that Internet maturity could explain why online prices and price dispersion are higher in China than in United States. Goyal (2010) shows that the Internet kiosks increase the efficiency of soya beans market in India. In some other countries, Internet technology is not available but alternative information technologies such as mobile phones in Niger (Aker 2010) or FM radio in Uganda (Svensson and Yagazinawa 2009) increase markets' efficiency.

Internet access and learning effects may be considered temporary sources of sellers' information rents and price dispersion. However, most of the literature suggests that price dispersion in online markets is a persistent phenomenon (Baylis and Perloff 2002; Baye et al. 2004a, b) and that learning effects may play some role in this persistent effect. In fact, learning costs may attenuate online price competition. This is especially true in the case of the learning costs related to the specific functionality of a retailer' website. Online retailers may provide specific functionalities such as memorization of names, addresses or payment details to lower the cost of using their website with respect to others, as consumers gain experience shopping with a particular online store. Johnson et al. (2004) believe that this lock-in mechanism could explain why consumers visit less online stores despite the fact that alternative sellers are "just a mouse click away". Therefore, retailers' specific customer experience may create switching costs and allow for price premiums. Clay et al. (2002) conclude that the relatively higher prices of Amazon.com may be explained by specific features that reinforce the customer experience such as recommendation systems and links to international book sites. On the other hand, these authors also suggest that other aspects of the online customer experience in online bookstores, such as loyalty programs and third party reviews of books, are related to lower prices. Clemons et al. (2002) describe how customer experience in online travel agencies may create switching costs and support price discrimination strategies. Nelson et al. (2007) show that retailers with better product information and product representation charge higher prices.

In addition to learning costs, online retailers should take into account waiting times in their online pricing strategies. Online sellers should adjust their strategies to the fact that Internet buyers face a buy-or-wait problem and have a reservation price related to this decision which may also change over time if firms follow mixed-price strategies. For this reason, online sellers may charge higher prices for high demand products to less patient customers and lower prices for low demand products to more patient customers. Loginova (2009) shows that consumers with high product valuations will be willing to pay higher prices to avoid waiting costs, while consumers with lower product valuations will be willing to wait for the product in exchange for lower prices. Dana and Orlov (2009) provide empirical evidence that shows the efficacy of such strategies, using as an example airlines which use price cuts to induce consumers to fly at off-peak times because efficiency gains outweigh the lost rents from consumers willing to fly off-peak times at regular prices. Chellappa et al. (2011) show that for online buyers of airline tickets higher waiting costs are related to higher reservation prices. Rabinovich et al. (2008a, b)

show that lower shipping times are related to handling and shipping operations with higher margins. Furthermore, handling and shipping margins are inversely related to product margins.

2.2 Sellers' Obfuscation Strategies and Competition on the Internet

Weaker price competition may be in part attributable to price and product information obfuscation. Information obfuscation prevents consumers from comparing one product to another as the products may not seem similar in certain key characteristics such as price, functionality or components. Buyer confusion is an important source of market power and may reduce price elasticity of demand (Scitovsky 1950; Perloff and Salop 1985). Therefore, firms have incentives to make it hard from consumers to compare different goods (Kalayci and Potters 2011). In online markets, Ellison and Ellison (2009) show how computer memory sellers may obfuscate price by combining low prices with high shipping costs, by varying warranties, by offering low prices for products that attract customers to buy different products. Each of these practices can frustrate consumers' price search. Raising the cost of learning about each firm's offerings and forcing more consumers to conduct firm-by-firm searches will reduce price competition.

Clay and Tay (2001) provide some evidence of how retailers combine low prices for some products and high prices for other products. For instance, some online book sellers charge low prices for more popular books in order to attract customers to buy less popular books with higher prices. Similarly, online used book sellers charge high prices on new books to push customers to buy used books. Ellison and Ellison (2009) show how computer component retailers charge low prices for products of low quality, with the hope that buyers will choose more expensive products once they realize the low quality of their first choice. Not only price but also product information obfuscation seems to be related to higher prices, as shown by Clemons et al. (2002) in the online travel industry. Other firms tend to obfuscate service information such as stock availability to increase search costs and thereby produce higher price dispersion (Baylis and Perloff 2002; Hann and Terwiesch 2003).

Sellers may also use price changes to obfuscate price information. Lower menu costs in online markets allow frequent changes in prices (Smith and Brynjolfsson 2000). For instance, Oh and Lucas (2006) observe that online sellers make price comparison difficult applying frequent and small changes to prices. These authors show that online markets for computers exhibit synchronized price changes, not random changes that are frequently found in traditional markets. Furthermore, they find that small price increases occur more frequently than decreases and the frequency of price adjustment is associated with weaker price competition. Iyer and Pazgal (2003) show that retailers in online markets adopt mixed strategy pricing

and change prices over time in order to extract the maximum surplus from both loyal customers and bargain hunters. In contrast, some other researchers suggest that random pricing is not a common strategy in online markets of homogeneous products, and that prices are relatively stable (Bailys and Perloff 2002; Chen and Hitt 2001; Bounie et al. 2010). Complex price formats make it difficult for consumers to become informed about the true nature of prices which would allow price discrimination strategies (Chellappa et al. 2011). Furthermore, in the case of operations in international markets sellers may obfuscate prices by using different currencies. Bachis and Piga (2011) show how providing price information in different currencies result in lower price competition for flights whose endpoints are in countries with different currencies. Clay and Tay (2001) show that this heterogeneity in international prices also weakens price competition in online book markets.

2.3 Market Entry and Competition on the Internet

Traditional economics proposes that the impact of a change in the number of sellers on prices' directional moves depends on the specific search model employed in the analysis. For instance, the Rosenthal (1980) search model suggests that as the number of competing firms increases prices go up, while the Varian (1980) search model considers the opposite effect. However, empirical evidence suggests that such ambiguity does not apply to search behavior in Internet markets. In these markets, information search seems to follow the Baye et al. (2004a, b) model which implies that the impact of market size on price competition depends on firms' information transmission costs.

Price competition will be fierce in markets with a large number of sellers and low information transmission costs. Increased price competition is explained by the fact that new sellers enter the market with offers at lower prices. Bounie et al. (2010) observe that new sellers of CDs and DVDs in United States, United Kingdom and France charge lower prices. Similarly, Haynes and Thompson (2008) confirm that in online markets for cameras, newer sellers put downward pressure on the lowest price. In the case of electronics products, Lindsey-Mullikin and Grewal (2006) found that as the number of online stores increases, so does price competition. It is interesting to note that hit-and-run strategies may have an impact on the relationship between online price competition and the number of sellers. Online sellers following hit and run strategies charge lower prices for specific products for short periods of time. Consequently, in the presence of these strategies the number of sellers in electronic markets does not increase monotonically and is quite unpredictable. Periods of fierce competition with a higher number of sellers alternate with periods with higher mean prices and less sellers (Baye et al. 2004b; Ba et al. 2012; Haynes and Thompson 2013).

3 Retailers' Differentiation Strategies and Competition on the Internet

To reduce price competition retailers may adopt differentiation strategies. Seller heterogeneity is explained by customer bases with different elasticities (Rosenthal 1980) or by different cost functions (Carlson and McAfee 1983). First, in markets with information costs, some retailers may have a larger base of loyal customers. Early movers, multichannel retailers with strong offline brands or retailers with superior service quality may have customers with more inelastic demands. In this context, early movers, retailers with stronger brands or better reputations or multichannel firms may charge higher online prices. Second, some retailers may have designed better operational processes or may benefit from operational synergies with offline distribution channels. Again, early movers or multichannel retailers may benefit from price premiums.

3.1 Brand, Reputation and Competition on the Internet

In markets with high information transmission costs for sellers, brands will play an important role in signaling product and service quality to consumers. In this type of market, firms with good reputations may charge higher prices and firms with bad reputations have to compete with lower prices (Baye and Morgan 2009; Bounie et al. 2010; Liu et al. 2012). Furthermore, in such a market, mixed channel retailers may benefit from strong offline brands. Cooper (2006) show that online sellers of contact lenses with strong reputation in offline channels charge higher prices than unknown retailers in the contact lenses market, where consumers are uninformed about their options. Also, early movers in these online markets may enjoy awareness advantages and charge higher prices (Chen and Hitt 2001; Pan et al. 2003; Ennew et al. 2005).

However, the advantage of strong brands in online markets may have a temporary impact as long as consumers become more informed over time. In fact, the entry into the market of new sellers with strong brands erodes the price premium and triggers price competition (Baye and Morgan 2009). Liu et al. (2012) show that the threshold for the number of sellers needed to spark fierce price competition is relatively low. Tang et al. (2010) observe that as more booksellers with stronger brands offer a book, both mean prices and price dispersion fall. This is confirmed by Liu et al. (2012) in their research on electronics and the findings of McDonald and Wren (2012) in car insurance, which showed that more informed consumers who perform more intensive searches make brand advertising and firms' reputations less important. Similarly, Waldfogel and Chen (2006) show that with Internet intermediaries that allow search cost reductions the tendency to choose branded retailers diminishes by roughly a tenth.

Some Internet intermediaries provide consumers with user-generated feedback regarding product and service quality. The evidence suggests that user generated

feedback has the same effect as brands in Internet markets. Haynes and Thompson (2012) find that buyers use user-generated feedback as a quality signal for digital cameras. They show that cameras with better and more user reviews have higher prices, especially in higher quality products. Bounie et al. (2010) find that the number of reviews is related to the price premium, while the number of positive reviews does not have a significant impact on price. High reputation sellers of postcards or coins can charge higher prices on eBay (Melnik and Alm 2002; Resnick et al. 2006). Consumer reviews are relevant not only for goods but also for services. For instance, hotels in the upper quality segment with higher review scores could charge higher prices than their competitors (Yacouel and Fleischer 2012).

The effects of consumer reviews on competition are similar but not equivalent to brands. Product search relying on brands seems to have a relatively lower search effort compared to customer reviews. For instance, Chevalier and Mayzlin (2006) find that customers read the reviews rather than relying on statistics. The higher search effort related to customer reviews-based decisions may explain the mixed evidence on the impact of customer reviews on prices. Chen and Xie (2008) observe that consumer reviews are more effective with higher quality uncertainty. They find that consumer reviews have a higher impact on purchase decisions of complex and mass-market products such as consumer electronics or home appliances, while for both simple products such as videogames and market niche products such as rare books which usually have more informed consumers, consumer reviews have a more limited effect because the average expertise of online consumers is higher. This argument is also supported by Gu et al. (2012), which confirmed that for complex products such as digital cameras, consumer reviews have a greater impact on online sales. However, the results provided by Zhu and Zhang (2010) contradict the observations above, since they find that consumer reviews are more relevant for purchase decisions for more rare products and of more informed customers. Zhou and Duan (2012) find that consumer reviews have a greater impact on online sales of niche products than on online sales of popular products in the software industry. In a similar vein, Adams et al. (2011) find that buyers do not consider sellers' reputation scores when buying cars on eBay. Baylis and Perloff (2002) also find that good consumer reviews do not have any impact on camera prices, but that they push scanners' prices upward. Resnick et al. (2006) find that customer reviews boost sales but are not related to price premiums. Finally, Bocksted and Goh (2011) demonstrate that as with brands, customer reviews are not effective to differentiate if the number of sellers with positive feedback is relatively high.

3.2 Operational Performance and Competition on the Internet

Firms with better operational performance may follow service differentiation strategies or penetration pricing strategies. Even if products are homogeneous across retailers, online firms may provide different levels of service. Firms

providing better service may charge higher online prices. Brynjolfsson and Smith (2000) find that sellers with better consumer reviews are considered to provide better products and more reliable service and can therefore charge higher prices. These authors suggest that consumers who care about accuracy in delivery time are less sensitive to both item and shipping price and more than four times more sensitive to the presence of brand in an offer than consumers who sort by price (Smith and Brynjolfsson 2001). Venkatesan et al. (2007) also provide empirical evidence supporting the relevance of service reviews and show that online sellers with better service quality reviews from customers may charge a higher price, unless most of the sellers have positive service quality reviews. Similarly, Reibstein (2002) observed that consumers give on-time deliveries a very high importance when deciding whether to make an online purchase from a given seller again, which can therefore charge higher prices than less efficient competitors. Rabinovich and Bailey (2004) suggest that newer retailers use service quality as a market entry strategy. Early movers and mixed channel retailers, with a larger market base, may not need high levels of inventory availability and costly, extremely high service levels. Furthermore, they are also likely to have more established relationships with suppliers, allowing for a greater reliance on inventory drop shipping and lower dependence on in-stock inventory to fulfill the orders from online shoppers. These authors also observe that mixed channel retailers may enjoy service quality advantage compared to pure Internet retailers because of cross channel economies of scale synergies in inventory management.

Sellers with better operational performance may follow penetration pricing strategies. Bulk purchase discounts and economies of scale in inventory management facilities may benefit large retailers (Haynes and Thompson 2013). Both good and bad operational performance may be related to fierce price competition. Retailers with good operational performance can better internalize fixed costs and offer better discounts. This operational advantage may explain why Amazon and Barnes and Noble charged relatively low prices in the early two-thousands, although they were not the cheapest retailers (Dinlersoz and Li 2006), or why French online booksellers with larger catalogs charge lower prices (Bounie et al. 2010). On the other hand firms with bad operational performance may have higher inventory costs which will be an incentive to reduce prices. For instance, bad operational performance may explain some hit and run strategies in online markets. Xing et al. (2004) show that online retailers may cut prices to reduce their inventory of obsolete models.

A common finding in the literature on electronic commerce is that some retailers charge low unit prices but high shipping costs. Clay and Tay (2001) provide evidence of this strategy in the online book industry. Similarly, Nelson et al. (2007) show that online book, CD and DVD sellers compensate for low prices by charging higher handling and shipping fees, while Ellison and Ellison (2009) show that computer components sellers follow similar strategies. This evidence suggests that online consumers may maintain separate mental accounts for shipping charges and product price or do not care about shipping costs. For instance, Hackl et al. (2011) show that shipping costs have a slightly positive

impact on online sales. Hossain and Morgan (2006) find that setting a low opening bid and high shipping and handling costs on eBay yields higher revenue than doing the reverse (Hossain and Morgan 2006). Baylis and Perloff (2002), Brown et al. (2010) find that increasing shipping costs may boost revenues when these costs are not disclosed to buyers before they fill their "shopping carts". It appears that compared to multi-channel retailers, pure Internet retailers tend to use these strategies related to shipping costs which result in higher total prices, more frequently (Ancarani and Shankar 2004). There is also some evidence that calls into question this argument. Smith and Brynjolfsson (2001) cast some doubts on the positive impact of higher shipping costs on the revenues of online book sellers and observe that online consumers are more sensitive to shipping prices and tax than to product price. Nevertheless, these authors suggest that their results should be interpreted with caution since the research related to this finding had some serious methodological limitations.

3.3 Channel Strategies and Competition on the Internet

Online sellers may follow multi-channel pricing strategies. Multi-channel retailers can differentiate themselves from pure Internet retailers through the combined benefits of offline and online channels. These retailers may provide more convenient access to information through the online channel and physical inspection, pickup and return services through the offline channel. Therefore, multichannel retailers may charge higher prices to coordinate prices across their different channels to prevent destructive competition between them. Most of the empirical evidence suggests that multi-channel retailers charge higher prices on the Web than their online-only competitors, although a multichannel retailer does not necessarily have to charge the same prices online and offline (Tang and Xing 2001; Pan et al. 2003; Bock et al. 2007). Ancarani and Shankar (2004) show that for homogenous products such as books or music CDs the average price levels are lower for pure Internet retailers than for multichannel retailers if shipping costs are not considered, since pure Internet retailers tend to charge higher shipping costs. Venkatesan et al. (2007) explain that multichannel sellers charge higher prices than pure Internet players because they have stronger brand recognition and provide shoppers additional convenience in terms of being able to switch transaction channels in the pre-ordering to post-fulfillment phases, for example, ordering online and taking delivery offline at a nearby store. The advantages of multichannel retailers may define entry strategies in some online markets. For instance, Dinlersoz and Pereira (2007) show that early adopters in the clothing and apparel online markets are multichannel retailers because of synergies between online and offline stores and because the need for physical inspection of the product reinforces brand loyalty. Consequently, in these markets multichannel retailers benefit from both operational synergies and early movers advantage and may charge higher prices than pure Internet retailers. However, Dinlersoz and Pereira (2007) suggest that market entry of multichannel retailers will depend on

the demand elasticity of their offline customers. Low cost firms such as Charles Schwab, which have customers with more elastic demands, will have stronger incentives to move into the Internet compared to firms competing for consumers with more inelastic demands such as Merrill Lynch.

Nevertheless, there are some doubts related to the persistent effect of multi-channel strategies on online prices over time. Some papers suggest that the effect of multi-channel strategies on prices tends to disappear over time. The theoretical findings of Jeffers and Nault (2011) support this argument and suggest that for homogenous products and markets with low frictional costs, such as CDs, books or DVDs online markets, multichannel retailers entry into online markets will lead to the classic Bertrand Paradox in offline markets whereby offline retailer will charge prices equal to marginal costs because price competition in online markets spreads into offline channels. Sengupta and Wiggins (2012) find similar evidence in the online travel industry and show that while multichannel entry in Internet markets increases price competition in online markets, it does so to a greater extent in offline markets. Xing (2010) confirms that price differences between pure Internet sellers and multichannel sellers decrease in the long run and tend to disappear in DVD online markets. Yang et al. (2010) suggest that pure Internet toy sellers tend to replicate multichannel price strategies over time. Li et al. (2009) also confirm the relevance of multichannel retailers' brands on price dispersion but show that DVD prices of pure Internet retailers and click and mortar retailers decrease but do not converge over time in Australia. Venkatesan et al. (2007) explain that multi-channel retailers' entry into online markets increases price competition because as the number of multichannel sellers in the market increases, there is less and less scope for service differentiation in terms of multichannel characteristics, thereby causing downward pressure on their prices.

Finally, online price competition may be the result of manufacturers' channel strategies. Yoo and Lee (2011) suggest that manufacturers will benefit from the introduction of an Internet store regardless of the level of vertical integration. Following a price discrimination strategy, manufacturers will push Internet prices downward while raising offline prices because they expect that the proportion of price hunters will be higher in online channels than in offline channels. Wolk and Ebling (2010) confirm this hypothesis empirically, showing that manufacturers with stronger brands and market power tend to compete in online markets with lower prices than in offline markets. In this setting, offline retailers reselling their products on the Internet will be forced by manufacturers to charge higher online prices than manufacturers or pure Internet sellers. Nevertheless, manufacturers' strategies will depend on the power distribution in channel structures. Carlton and Chevalier (2001) show that in the perfume and DVD player markets, manufacturers have strong market power and can control online distribution by establishing their own online shops, while in the appliances market retailers with strong market power prevent direct online sales by manufacturers. These authors find that multichannel retailers charge higher online prices than pure Internet players, while manufacturers selling online charge higher prices than retailers. They suggest that manufacturers charge high prices in online markets to avoid the risk of

cannibalizing traditional channels. Channel cannibalization seems to be real threat in some industries. For instance, Umit Kucuk and Maddux (2010) describe how online competition in the wallpaper industry reduced the incentives of multi-channel retailers to compete on price rather than on service quality. This situation decreased overall service quality and increased customer dissatisfaction, provoking the decline of the whole industry.

4 Product Heterogeneity and Competition on the Internet

Most of the research on price dispersion studies homogenous products. However, as already stressed by Bakos (1997), information search on product quality is a significant determinant of online price. Complex products such as cars or computers have more attributes to examine. Consumers will incur a higher cost to gain a particular level of understanding of complex product quality through online searching. Therefore, more complex products will imply higher quality uncertainty and greater search efforts. Overby and Jap (2009) confirm the argument that online buyers will be at a greater informational disadvantage for products of high quality uncertainty than those of low quality uncertainty and show that online buyers and sellers prefer to trade used cars with low quality uncertainty. The main effect of high quality uncertainty on Internet competition is that buyers tend to limit product search to brands, and therefore sellers with strong brands may charge higher prices. Lal and Sarvary (1999) show that when product quality uncertainty is high, consumers will limit their Internet search to the brands they know, increasing the likelihood of monopoly pricing. Huang et al. (2009) confirm that quality uncertainty limits product search also for experience goods, because quality evaluation of this category of products require increased cognitive effort. Pozzi (2012) also observes high search costs in online grocery shopping that limit consumers' search intensity and concentrate sales in a few sellers. Hortaçsu et al. (2009) observe that when there is risk of breach of contract, buyers on eBay prefer to limit search and purchase to products from sellers inside their metropolitan area. Baylis and Perlof (2002) observe in the market for electronics that moderate levels of search costs and quality uncertainty imply higher price dispersion and higher prices in online markets. Brynjolfsson et al. (2010) suggest that more intensive search may be motivated by a desire to locate products with attributes such as a good reputation or a strong brand as product quality signals, instead of just low price. Frequently, consumers have heterogeneous levels of quality uncertainty. In this case, online sellers will try to exploit this heterogeneity by establishing mixed pricing strategies and charging higher prices to uninformed customers as shown by Clemons et al. (2002) in the online travel market. Clay and Tay (2001) show that online prices are lower for bestsellers and higher for more rare books. Similarly, Baye et al. (2004a, b) find a slightly negative relationship between prices and product popularity. Marketing literature considers that when a large proportion of consumers are uninformed, using high prices as quality signals may be an efficient competitive strategy for high quality sellers (Bagwell and Riordan (1991).

The literature on online markets provides scant evidence to support this strategy. Recently, Ong and Zhong (2011) suggested that users of the Chinese online market TaoBao use prices to signal quality.

In some electronic markets with high levels of quality uncertainty, brands and prices are not efficient signals of product quality. These electronic markets are similar to Akerlof's "markets for lemons" where search yields poor results and high quality uncertainty push average prices downward and drives good quality products out of the market. This situation confirms recent theoretical models on search costs that suggest that lower search intensity is related to low prices (Waldeck 2008). According to these models, price levels are an inverted U-shaped function of search intensity with the highest levels of price associated with moderate levels of quality uncertainty. Overby and Jap (2009) provide empirical evidence of low prices in markets with high product market uncertainty and show that prices for cars with high quality uncertainty have a significant discount in online channels and that as a result sellers tend to present these cars in offline channels. Koppius et al. (2004) find that electronic flower markets entail a decrease in information about flower quality compared to the physical markets and consequently lower bids in flower auctions. Similarly, Dewan and Hsu (2004) show that because of the greater uncertainty of eBay markets, stamps are sold on eBay with an average discount of 10 % compared to the prices traded on specialty auction sites.

Product value is also related to online price competition. There is empirical evidence of an inverse relationship between product value and online search effort. Consumers' low willingness to search for alternative products of high value in a market builds on Weber's law of psychophysics (Grewal and Marmonstein 1994). Applied to consumer search effort, this law implies that the psychological utility that a consumer derives from saving a fixed amount of money through increased information search is inversely related to the price of the item. According to this assumption, consumers' searches will be less intensive for more expensive items in electronic markets and therefore prices will be higher. Pan et al. (2003) show differences in price competition between low value products (books, CDs and DVDs) and high value products (electronics). Ghose and Yao (2011) confirm the inverse relationship between product value and price competition in B2B markets. Lindsey-Mullikin and Grewal (2006) show a similar relationship between price competition and the mean price of VCR, televisions and other electronics. Lower price competition for higher value products can also be explained by higher frictional costs (Hann and Terwiesch 2003), especially those related to waiting costs (Longinova 2009), or higher quality uncertainty since value and product complexity may be correlated (Popkowski Leszczyc et al. 2009).

5 Conclusions and Future Research

Price competition in Internet markets has been a subject of much debate in the literature. While different models have explained discrete aspects of price competition, there have been fewer empirical studies focusing on retailers' strategies to

counterbalance the increased market power of consumers in electronic markets. To overcome this problem, this chapter has integrated the economics, operations research and marketing literature into a single framework based on the three main assumptions of Bertrand model of price competition.

Retailers can establish price discrimination strategies to leverage the heterogeneity of online consumers' cost information. Differences between countries in Internet access costs may allow vendors to integrate geographical price discrimination strategies into their international expansion strategies. In this case, sellers can charge higher prices in those countries where consumers have lower rates of Internet access. Moreover, retailers may be able to design their sites to trigger mechanisms that increase switching costs from one site to another. The literature review shows that the strategy of price discrimination can also be supported in the different waiting costs consumers incur, charging higher prices to consumers with higher waiting costs.

The versatility of the Internet as a communication tool allows retailers to develop information obfuscation strategies that increase information costs. The literature in this field shows how retailers try to increase consumers' information costs through the use of HI-LO pricing strategies, continuous changes in prices or the obfuscation of information related to product characteristics or shipping.

Regarding the relationship between entry strategies in electronic marketplaces and search costs, the literature indicates that the entry of competitors into online markets increases competition if online consumers and retailers are able to reduce information search and information communication costs respectively. Therefore, the relationship between the number of competitors and price competition for homogeneous goods seems more in line with the Varian (1980) and Baye et al. (2004a, b) models in which the electronic market has an influence on information costs and thus alters the proportion of loyal customers versus the proportion of shoppers in the market. However, if electronic markets do not affect these information costs and as a result the ratio of loyal customers and shoppers remains constant, the Rosenthal (1980) model seems to offer a better explanation of the impact of a growing number of retailers on price competition. Therefore, in markets with heterogeneous product it is more probable that a growing number of competitors will not cause such a dramatic increase in competition. Nevertheless, the empirical literature on online markets suggests that Rosenthal's model (1980) will work fine as long as the number of competitors adopting differentiation strategies is limited. As the number of retailers with differentiation strategies increases, the differentiation advantage seems to dissolve and price competition seems to increase. So far, the literature provides initial evidence that price competition is fierce in markets with a large number of retailers with intensive brand advertising, with multichannel strategies or with good customer reviews. In fact, recent literature suggests that some differentiation strategies of online retailers have limited effects over time. Therefore, the study of the degree of inimitability of retailers' differentiation strategies should be a fruitful field of research. For instance, brand differentiation strategies of online retailers rely on superior service, early market entry or offline brands. The literature appears to provide some initial

evidence that early movers can enjoy a permanent advantage in online markets, while offline brand or service advantages are more temporary. The limited effect of service differentiation explains why incumbent retailers in online markets tend to adopt EDLP pricing strategies combined with not particularly high service quality, while new entrants adopt penetration strategies characterized by the combination of HI-LO pricing strategies and high quality service. Moreover, it seems that consumer elasticity is higher for the product component than for the service component, and that companies with EDLP strategies tend to charge higher shipping costs in order to offset lower product margins.

The literature also suggests that the operational advantages of multichannel retailers tend to fade over time as the number of multichannel retailers and the operational efficiency and reputation of pure Internet players increase. However, these operational advantages are a significant entry barrier for pure Internet players especially in markets with higher costs of information. Therefore, multichannel retailers may profit from early mover advantages in markets of heterogeneous products. A relatively new and unknown element in the analysis of online price competition is vertical channel coordination. Initial evidence and theory suggest that retailers in decentralized channels may benefit from higher prices only if manufacturers have very limited market power.

Finally, information costs in electronic markets for complex, rare or high value products are higher and allow retailers with strong brands or premium service to enjoy a sustainable advantage. However, high levels of information costs may not be desirable for online retailers, as they may expel high quality retailers from the market and force price competition among low quality retailers.

This chapter has shown that online retailers often escape the law of one price. Information costs are still significant in many electronic markets and differentiation strategies can confer advantages to online retailers that persist over time. It is clear that this field of study remains in its early stages and there are still many promising lines for future research. First, while most of the empirical evidence comes from research on U.S. markets, evidence from other countries raises doubts about some of the conclusions reached thus far. Therefore, future research should systematically address the roots for these differences in online markets. For example, it would be really interesting to look at how electronic markets emerge and grow in developing countries. Second, little research has been done on the relationship between functionality, switching costs for consumers and price competition. While it seems obvious that higher switching costs will ease price competition, the most effective mechanisms for raising these switching costs remain unknown. Also the literature on information obfuscation strategies in online markets is at an early stage. While Ellison and Ellison (2009) provide an interesting starting point for this challenge, the Internet allows for a wide range of strategies, many of which have not benefited from much study and remain unknown to retailers. Third, it would be interesting to delve into the temporary nature of differentiation advantages and to understand what differentiation strategies are more sustainable than others in online markets. Given the relevance of customer reviews on Internet markets, the relationship between brand identity,

reputation and customer reviews remains unclear. More precisely, future research should clarify the mixed evidence on the impact of customer reviews on prices and the complementary or substitution relationship between brand identity and online reputation. Regarding pricing strategies there is insufficient evidence on the effectiveness of prices as quality signals in online markets. Furthermore, the evidence on random price strategies in Internet markets is mixed and provides different and sometimes contradictory explanations. In this regard, it is unclear whether random pricing is the result of obfuscation strategies, price discrimination strategies or simply the bounded rationality of retailers who must make continuous adjustments to prices because they know the actual demand elasticity. Finally, future research should clarify the impact of EDLP and HI-LO pricing strategies on online retailers' profitability.

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Part III.1
Key Business Processes, Areas and Activities: Production/Operations

Leveraging Information Systems for Enhanced Product Innovation

Gordon Burtch, C. Anthony Di Benedetto and Susan M. Mudambi

Abstract While firms have become more tech savvy, the leveraging of information systems for product innovation remains a challenge to firms, from large multinationals to the smallest start-ups. Successful practices vary, but one commonality is experimentation. As a result, firms are trying out a range of digital initiatives. This study explores three important methods by which firms are using information systems to improve the process of product innovation or new product development. These include: "listening in" to social media, crowd-funding, and virtual product teams.

Keywords Information systems · Product innovation · New product development · "Listening in" · Crowd-funding · Virtual teams

1 Introduction

While firms have become more tech savvy, the leveraging of information systems for product innovation remains a challenge to firms, from large multinationals to the smallest start-ups. Successful practices vary, but one commonality is

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experimentation. Firms are trying out a range of digital initiatives. Three examples of the use of information systems for product innovation include: "listening in" to social media, crowd-funding, and virtual product teams.

2 Listening In

To improve existing products and services, and to get new ideas about customer needs, firms often ask customers for their views. Yet, what consumers say to a firm in a market research study can be very different from what consumers say to each other. Although focus groups of customers can generate good consumer-to-consumer discussions, firms can gain even more insight by "listening in" to unstructured consumer discussions online on discussion forums, product review sites, and social media sites such as Facebook and Twitter.

Perhaps the most difficult hurdle for firms to overcome is the acknowledgement that firms are not fully in control of brand image. A firm asserting in an advertisement that it is "cool" does not make it cool. Brand image is in the eye of the consumer, and is expressed in the words of the consumer. Online consumer conversations clearly indicate that consumer conversations can be more powerful than firms in shaping the perceptions of other consumers. Both tangible and intangible attributes of a product are open to consumer debate and discussion. Taken together they affect brand image and brand personality.

Despite the availability of digital tools, most firms do not have a routine system implemented for monitoring what consumers are saying about them or their brands online. Even firms that pride themselves on their social media marketing savvy often fail to go beyond counting how many "likes" their site or posts generate. This can be partly explained by the volume and varying relevance of online comments.

For many firms, the starting point is to track and respond to online comments that are critical of product or service quality. These comments can provide timely and relevant input for improving existing products and processes. In this area, listening in can be undertaken from several different perspectives. One limited goal may be to reduce the consequences of negative online word of mouth, and to correct misstatements. A broader, more challenging perspective is to utilize consumer online conversations to identify ideas for new product innovation. This requires a wider and more systematic approach of analyzing consumer conversations about the current products of a firm and its competitors, and examining expectations and areas of disappointment.

Being a good listener online can also lead to improved conversations with customers. Firms are experimenting with online concept testing, where they float an idea and then encourage and gauge consumer reaction. With the constraint of not wanting to tip one's hand to potential competitors, firms seek and tap a number of creative ways to get the "crowd" to share views on new ideas and innovations.

Many new opportunities exist for firms to listen into, and respond to, customer comments. Customers also can effectively interact with each other to identify and invest in new entrepreneurial opportunities. The next section explores how entrepreneurial activity can be stimulated through such crowd-funding activities.

3 Crowd-funding

Crowd-funding has been defined as a collective effort by individuals who network and pool their money together, usually via the Internet, to invest in or support the efforts of others (Ordanini et al. 2010). In crowd-funded marketplaces, any individual can propose a project, and others can then provide their funds in support. These markets are quite novel in that they simultaneously offer entrepreneurs the dual benefits of access to early stage funding and preliminary feedback and input from potential users or customers. This allows entrepreneurs to reduce the costs of new product development and to increase customer awareness. In this sense, crowd-funding draws variously on aspects of micro-finance, open innovation and crowdsourcing (Chesborough 2006; Howe 2008; Schwienbacher and Larralde 2012; Terwiesch and Xu 2008).

Research into crowd-funding is comparatively recent. Lin et al. (2013) studied lending behavior on Prosper.com, finding that lending is greater when the borrower exhibits greater social capital. Other recent studies examined the potential for herding among lenders (Zhang and Liu 2012) and contributor motivations in donation-based crowdfunding (Aitamurto 2011; Burtch et al. 2013).

A given Crowd-funded markets can be classified into one of four types: (1) lending-based, (2) reward-based, (3) donation-based or (4) equity-based. Amongst these, donation- and lending-based platforms are the longest standing. Well-known examples of these types of markets include Kiva.org and Prosper.com, respectively. Reward-based platforms, where individuals receive "perks" from the entrepreneur for exceeding associated contribution thresholds, have recently come to the fore. Perhaps the most notable example of this funding format is Kickstarter.com, which has seen extensive media attention of late. Lastly, equity-based platforms, where individuals receive equity in the entrepreneur's business in exchange for their funds, are common in much of the world, but are virtually non-existent in the United States, due to legal restrictions. GrowVC is perhaps the best-known example of this funding format at the moment.

As crowd-funded markets have boomed in recent years, their economic potential has become apparent. Crowd-funding helped new ventures to raise nearly $2.7 billion in 2012, and that number is expected to surpass $5.1B in 2013 (Massolution 2013). This explosive growth has resulted in significant attention, from both the media and U.S. legislators, whose discussions have maintained a persistent call for informed regulation and design of crowd-funded markets; a necessary effort to ensure the protection of crowd-funders and entrepreneurs, as well to enhance the efficiency and sustainability of the industry.

A primary hurdle to this objective is an ongoing lack of understanding about participants' behavior in these markets. There are at least two interesting directions for future research in this regard. First, to improve the design of these markets and their processes, the application of recent findings from the collective intelligence literature can likely be of great benefit. Woolley et al. (2010) suggest that gender and other forms of diversity in the body of crowd-funders, as well as the pattern and distribution of contributions and participation, should be important determinants of marketplace performance. Further, work by Lorenz (2011) suggests that independence of decision-makers is essential. Second, industry analyses have suggested that crowd-funding for financial returns (equity- or lending-based) is best applied with digital and information goods, such as software, films, music and literature, while donation- and reward-based crowd-funding work best with campaigns that appeal to crowd-funders personal beliefs or passions (Massolution 2013). However, these observations are anecdotal at present, and would therefore benefit from a theoretically informed, rigorous evaluation.

4 Virtual Teams

Previous sections have outlined how communication between customers, and from customer to firm, can be facilitated through advances in information systems to result in new, innovative products. But firms also take full advantage of these systems to facilitate communication between new product team members, even those based in different parts of the globe. Such virtual global development teams (virtual GDTs) are extremely common now and used effectively by leading firms in many industries.

GDTs face many serious challenges, including language and cultural barriers; nevertheless, with good communication systems in place, globally dispersed teams can be more effective and efficient than traditional ones (Hoegl et al. 2009). There are many early examples of notable firms that have successfully supported virtual GDTs. Boeing integrated rocket engine designers with partner firms throughout the world through Web-based new product systems, allowing them to cut design time and costs while also reducing the number of required parts (Sethi et al. 2003). Often, specialized tools need to be used to facilitate the meeting process (keep in mind that these virtual team members may rarely if ever see each other). For example, regular e-mails or attachments may be good enough to communicate verbally, but would be inadequate for designers who need to discuss and provide input to three-dimensional models. Visual Issues Management software may be used to facilitate viewing of the model, allowing remote participants to make changes and flag problems easily (Bashada 2009). Since communication using these tools is very easy, there is little additional cost in bringing in designers and other specialists as early as possible in the development program to identify and correct likely problems while they are still easy and cheap to fix. Ultimately, development cost is reduced, and speed to market is accelerated.

A couple of detailed examples illustrate the diverse ways in which firms have benefitted from virtual GDTs. Ford senior management claims to have cut new product engineering costs by 60 % from 2005 to 2008, while launching successful new cars such as the Ford Fusion during this time. Ford's strategy involves using global platforms unified by virtual GDTs. New product groups are assigned responsibility for one of the car's systems, say, the exhaust system or steering wheel design. Thus, one group will design the exhaust system applied to all Fords sold worldwide, resulting in great time and cost savings. Since all steering mechanisms are designed in one location, Ford steering wheels all have the same distinctive "feel" and Ford engines all have the same "sound signature" regardless of where the car was made. Extensive communication among Ford engineers, designers, and managers worldwide is essential for this platform strategy to work (Vasilash 2009). As another early example, Kodak used virtual GDTs to develop new chemicals used in movie film processing. Scientists from France, film systems experts from the U.S. and Europe, and U.S.-based product managers and marketing personnel were key members of the development team, while the launch team was truly worldwide, comprising members from North and South America, Asia, and Australia. In Kodak's case, some language- and culture-related difficulties they encountered were overcome by having infrequent face-to-face meeting in addition to the virtual meetings (Crawford and Di Benedetto 2010, p. 362). Virtual GDTs have been adopted by many firms, with mixed results in some cases as firms gain experience.

As information systems continue to improve, and more firms seek global efficiencies, the success rate of virtual product teams will likely increase. Together with improved information systems for listening to consumer product discussions online, and the increased viability of crowd-funding initiatives, it is clear that management information systems have shaped, and will continue to shape, product innovation for the foreseeable future.

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Processes Integration and e-Business in Supply Chain Management

Beatriz Minguela-Rata, Daniel Arias-Aranda and Marco Opazo-Basáez

Abstract Turbulence and competitiveness define the current global business environment. Firms need to develop high quality products and services quickly and at lower costs than competitors by improving their internal operations as well as focusing on core activities while outsourcing non-core activities. This increasing competition forces firms to integrate their suppliers and customers into the overall value chain processes. To achieve this integration, sharing relevant information among components of the supply chain becomes crucial. Moreover, in these situations, information and communications technologies play a central role by allowing information sharing among suppliers and customers through facilitating information availability and reducing the bullwhip effect and improving quality. The purpose of this paper is threefold. Firstly, it intends to provide an extensive theoretical framework on Supply Chain Management process integration. Secondly, e-business is presented as a SCM integration processes enhancer, and thirdly, some practical implications for managers are provided.

Keywords Supply chain integration · e-SCM framework · e-procurement · e-collaboration · e-fulfillment

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1 Introduction

Nowadays, firms operate in a global business environment which is characterized by an increasing turbulence and competitiveness. This forces companies to develop high quality products that meet consumers' needs, quickly and at lower costs than competitors. Therefore, on the one hand, this increasing competition has forced firms to improve their internal operations. Another tendency for businesses is to concentrate their efforts on their core activities and outsource non-core activities. This phenomenon causes that variables related to quality, delivery and price of products, depend not only on the capabilities of a company, but also largely on the provider network it interacts with (Modi and Mabert 2007). On the other hand, this increasing competition has driven firms to focus on integrating their suppliers and customers into the overall value chain processes (Klein 2007; Prajogo and Olhager 2012). Therefore, the integration among companies of supply chain is a key factor for competitive position, especially when the environment is characterized by uncertainty and dynamism (Youssef 1992; Handfiel and Nichols 1999; Frohlich and Westbrook 2001; Sanders 2007, 2012). This integration involves upstream and downstream relationships. In this sense, Hammer (2001) argues that successful companies are those that apply this approach in their business activities by working closely with partners to design and manage processes that go beyond their organizational boundaries. Harland et al. (2007) state that in the current environment, in many cases, competition is not a matter of company competitiveness, but a matter of supply chain competitiveness.

To achieve this integration, sharing relevant information among components of the supply chain becomes crucial. Besides, in these situations information and communications technologies in general, and the Internet and the Web in particular, play a central role by allowing information sharing among suppliers and customers while facilitating information availability by reducing the bullwhip effect and improving quality. Thus, integration is a both sided advantage (supplier-customer) in a way that suppliers can organize detailed production and customers are able to respond in time to market needs, reducing uncertainty, inventory levels and costs (Lee and Whang 1998). Moreover, nowadays many companies have integrated information and communication technologies (ICT) in their supply chain, so companies facilitate the alignment of forecasting and scheduling of operations between partners of supply chain, allowing better inter-firms coordination (Prajogo and Olhager 2012). Concepts like e-commerce, e-procurement and e-collaboration are now part of a dynamic supply chain in which the Internet turns into a natural platform. In fact, the impact of the Internet on supply chain Management allows sharing a large amount of information along the Supply Chain in real time, including operations, logistics and strategic planning data. This circumstance provides firms with more visibility, improves production planning, inventory management, and distribution (Devaraj et al. 2007; Sanders 2007). The purpose of this paper is threefold. Firstly, it intends to provide an extensive theoretical framework on Supply Chain Management process integration. Secondly,

e-business is presented as a supply chain management integration processes enhancer, and thirdly, some practical implications for managers are provided.

The paper is organized as follows: in Sect. 2, eight supply chain management key processes are analyzed by identifying their respective sub-processes. In addition, five business processes and their respective characteristics are depicted. In Sect. 3, the supply chain integration process is described along with the types of information shared among supply chain partners. In this chapter we also attempt to describe the bullwhip effect; its sources, causes, characteristics and the importance to minimize its impact on ICTs. In the Sect. 4 we introduce e-Supply Chain Management; its main activities, concepts, applications and processes involved, through internet and IT use among partners. Finally in Sect. 5 we present the main conclusions, suggestions for further analysis, managerial implications, and a brief discussion of the practical implications.

2 Supply Chain Management: Concept and Processes

The scope of Supply Chain Management (SCM) has created a certain discussion in the literature (Croom 2005). As a result, Oliver and Webber (1992) considered it as just the mere planning and control of the total materials flow while Ellram (1991) considered SCM as an alternative form to vertical integration. Other perspectives as of Ellram and Cooper (1993) consider SCM as the management of relationships both between corporate functions and across companies and define SCM as the management of a network of organizations or entities (Christopher 1998; Lee and Ng 1997). More recent literature such as Council of Logistics Management (2003) argues that SCM is implemented by integrating corporate functions using business processes within and across companies; so, SCM includes more than just the activities of any individual corporate function (Lambert et al. 2005). In this line of reasoning, Croom (2005) proposed SCM to focus on some of the core processes and functions related to the management of supply chains (for example, fulfillment, operations planning and procurement). Currently, SCM is considered a dynamic and ever-changing process that requires the coordination of all activities among partners of the supply chain in order to satisfy the final customer and maximize total supply chain profitability (Sanders 2012).

In the last decades, academics have tried to describe the key business processes of supply chain management. The Global Supply Chain Forum (Cooper et al. 1997) defined supply chain management as "the integration of key business processes form end user through original suppliers that provides products, services, and information that add value for customers and other stakeholders" (Lambert et al. 1998:1). Its implementation requires three main elements: the supply chain network structure, the supply chain business processes, and the management components. Lambert et al. (2005) argue that supply chain network structure is comprised of member firms linked to key processes. In this framework, eight supply chain management processes are identified: customer relationship

management, customer service management, demand management, order fulfillment, manufacturing flow management, supplier relationship management, product development and commercialization, and returns management.

Previously, the Supply Chain Council developed the Supply-Chain Operations References framework (SCOR model) in 1996. Initially, this framework included four business processes. Later, in 2001 (Supply-Chain Council 2001), a fifth process was added resulting into plan, source, make, deliver, and return (Lambert et al. 2005). Srivastava et al. (1999) suggested an alternative framework incorporating three business processes: customer relationship management, product development management, and supply chain management. Another framework was suggested by Bowersox et al. (1999) based on three contexts: operational, planning and control, and behavioral (Lambert et al. 2005). On the basis of this latter framework, Melnyk et al. (2000) included eight business processes: plan, acquire, make, deliver, product design/redesign, capacity management, process design/redesign, and measurement (four of eight business process were already included in the SCOR model).

Supply chain management frameworks focused on the cross-functional interaction within a firm and on the relationships developed with other supply chain members were introduced in later research (see Mentzer 2001; Mentzer et al. 2001; Mentzer 2004). Therefore, SCM is referred as the integration of all activities that add value to customers, from product design to delivery, taking into account the existence of three flows between the initial suppliers and final customers: a flow of goods, a flow of information, and a flow of money (Fisher 1997; Lee and Whang 1998; Huang et al. 2002; Pagell 2004; Power 2005; Nurmilaakso 2008; Prajoso and Olhager 2012; Sanders 2012, among others). For Simchi-Levi et al. (2000:1) "SCM is a set of approaches utilized to effectively integrate suppliers, manufacturers, warehouses, and stores, so that merchandise is produced and distributed at the right quantities, to the right locations, and at the right time, in order to minimize system-wide cost while satisfying service level requirements".

Nowadays, managing relationships with customers, suppliers and the rest of partners of the supply chain is a challenge and an element of competitive differentiation (Arias-Aranda et al. 2010). To achieve this, a greater coordination and synchronization is necessary through information process sharing based on cooperation among firms, where information and communications technologies (ICT) on various value-adding activities along the supply chain have an essential role (Naylor et al. 1999; Gunasekaran and Ngai 2004; Bagchi et al. 2005; Wagner and Sweeney 2010, among others). In this sense, Sanders (2012) distinguishes three SCM activities: coordination, information sharing, and collaboration. Higher levels of integration are characterized by increased logistics-related communication, greater coordination of the firm's logistics activities with those of its suppliers and customers, and more blurred organizational distinctions between the logistics activities of the firm and those of its suppliers and customers (Stock et al. 2000; Prajoso and Olhager 2012).

The eight supply chain management key processes identified by Global Supply Chain Forum (Croxton et al. 2001; Lambert et al. 2005) are described by a collection of sub-processes at strategic and operational levels:

- *Customer Relationship Management*. This process provides the structure on how the relationship with the customer is developed and maintained. This process includes five sub-processes at the strategic level: (1) review corporate and marketing strategy, (2) identify criteria for categorizing customers, (3) provide guidelines for the degree of differentiation in the product/service agreement, (4) develop framework of metrics, and (5) develop guidelines for sharing process improvement benefits with customers. The purpose of this process at strategic level is to identify key customers, provide criteria for categorizing customers, provide customer teams with guidelines for customizing the product and service offering, develop a framework for metrics, and provide guidelines for the sharing of process improvement benefits with the customers (Croxton et al. 2001). At the operational level, this process intends to write and implement the product and service agreement through seven sub-processes: (1) differentiate customers, (2) prepare the account/segment management team, (3) internally review the accounts, (4) identify opportunities with the accounts, (5) develop the product/service agreement, (6) implement the product/service agreement, and (7) measure performance and generate profitability reports.
- *Customer Service Management*. Croxton et al. (2001) and Lambert et al. (2005) define this process as the firm's frontline for the customer and a single source of customer information (e.g., product availability, shipping dates and order status). Real-time information is provided to the customer through interfaces with the firm's functions, such as manufacturing and logistics. This process includes four sub-processes at the strategic level: (1) develop customer service strategy, (2) develop response procedures, (3) develop infrastructure for implementing response procedures, and (4) develop framework of metrics. The purpose of this process at strategic level is to develop infrastructure and coordination means for implementing the product/service agreement and providing a key point of contact to the customer (Croxton et al. 2001). At the operational level, this process must respond to internal and external events through four sub-processes: (1) recognize event, (2) evaluate situation and alternatives, (3) implement solution, and (4) monitor and report.
- Demand *management*. This process provides the structure for balancing the customers' requirements with the supply chain capabilities. It also develops and executes contingency plans when some events disrupt the balance of supply and demand. This includes forecasting demand and synchronizing it with production, procurement and distribution (Croxton et al. 2001; Lambert et al. 2005). This process includes six sub-processes at the strategic level: (1) determine demand management goals and strategy, (2) determine forecasting procedures, (3) plan information flow, (4) determine synchronization procedures, (5) develop contingency management system, and (6) develop framework of metrics. At the operational level, demand management executes the forecasting,

synchronization and contingency plans through five sub-processes: (1) collect data/information, (2) forecast, (3) synchronize, (4) reduce variability and increase flexibility, and (5) measure performance.

- *Order fulfillment*. This process includes all activities needed to deliver the order to the consumer (Giménez and Lourenço 2008): definition of customer requirements, design of a network considering manufacturing, logistics and marketing requirements -since this design of the network has a significant influence on the cost and performance of the system-, and enable the firm to meet customer request (Croxton et al. 2001; Croxton 2003). This process includes five sub-processes at the strategic level: (1) review marketing strategy, supply chain structure and customer service goals, (2) define requirements for order fulfillment, (3) evaluate logistics network, (4) define plan for order fulfillment, and (5) development framework of metrics. At the operational level, this process includes seven sub-processes related to customers' orders (Croxton et al. 2001): (1) generate and communicate order, (2) enter order, (3) process order, (4) handle documentation, (5) fill order, (6) deliver order, (7) perform post-delivery activities and measure performance.
- *Manufacturing flow management*. This process deals with making the products and establishing the manufacturing flexibility required to serve the target markets (Croxton et al. 2001). This process includes all activities necessary to obtain, implement and manage manufacturing flexibility and transports products through the plants within the supply chain (Lambert et al. 2005). This process includes six sub-processes at the strategic level: (1) review manufacturing, sourcing, marketing, and logistics strategies, (2) determine degree of manufacturing flexibility requirement, (3) determine push/pull boundaries, (4) identify manufacturing constraints and determine capabilities, and (5) development framework of metrics. The purpose of this process at strategic level is to determine the manufacturing infrastructure needed for fulfilling the customer's needs and wants (Croxton et al. 2001). At the operational level, Croxton et al. (2001) argue that this process is directly related to internal operations management even though some characteristics of the process are designed to integrate internal operations management with activities in the supply chain. At this level, four sub-processes can be identified: (1) determine routing and velocity through manufacturing, (2) manufacturing and materials planning, (3) execute capacity and demand, and (4) measure performance.
- *Supplier relationship management*. This process relates a firm with their suppliers (Giménez and Lourenço 2008). Therefore it is connected with upstream relationships, preferably with a small number of suppliers, but for a long time. This process includes five sub-processes at the strategic level: (1) review corporate, marketing, manufacturing and sourcing strategies, (2) identify criteria for categorizing suppliers, (3) provide guidelines for the degree of customization in the product/service agreement, (4) develop framework of metrics, (5) develop guidelines for sharing process improvement benefits with suppliers. In this level, the firm needs to establish clearly the network of relationships it will maintain, and the process for segmenting the suppliers and working with them to develop

appropriate product/service agreement under a win–win basis (Croxton et al. 2001). At the operational level, seven sub-processes can be identified: (1) differentiate suppliers, (2) prepare the supplier/segment management team, (3) internally review the supplier/supplier segment, (4) identify opportunities with the suppliers, (5) develop the product/service agreement and communication plan, (6) implement the product/service agreement, (7) measure performance and generate supplier cost/profitability reports.

- *Product development and commercialization*. This process provides the structure for developing and bringing to market new products for integrating customers and suppliers in order to reduce time to market (Croxton et al. 2001; Rogers et al. 2004; Lambert et al. 2005). This process includes six sub-processes at the strategic level: (1) review corporate, marketing, manufacturing and sourcing strategies, (2) develop idea generation and screening processes, (3) establish guidelines for cross-functional product development team membership, (4) identify product rollout issues and constraints, (5) establish new product project guidelines, and (6) develop framework of metrics. Croxton et al. (2001) and Lambert et al. (2005) distinguish eight sub-processes at the operational level: (1) define new products and assess fit, (2) establish cross-functional product development team, (3) formalize new product development project, (4) design and build prototypes, (5) make/buy decision, (6) determine channels, (7) product rollout, and (8) measure process performance.
- *Returns management*. Actually, an effective returns management is vital for the firm to achieve a sustainable competitive advantage. For this, firms can identify productivity improvement opportunities and breakthrough projects (Croxton et al. 2001). This process includes all activities related to returns, reverse logistics, gatekeeping, and avoidance (Rogers et al. 2002; Lambert et al. 2005). Croxton et al. (2001) and Lambert et al. (2005) identify six sub-processes at the strategic level: (1) determine returns management goals and strategy, (2) develop avoidance, gatekeeping and disposition guidelines, (3) develop returns network and flow options, (4) develop credit rules, (5) determine secondary markets, and (6) develop framework of metrics. At the operational level, these authors distinguish six sub-processes: (1) receive return request, (2) determine routing, (3) receive returns, (4) select disposition, (5) credit consumer/supplier, and (6) analyze returns and measure performance.

The five business processes identified by the Supply Chain Council (Supply-Chain Council 2003:7; Lambert et al. 2005:29) are as follows:

- *Plan*. This process tries to balance aggregate demand and supply to develop a course of action which best meets sourcing, production, delivery requirements, and management returns. The main goals are to access to supply sources, to add demand needs, to plan inventories, to calculate medium- term capacity, to use outsourcing or not, to design supply chain, to determinate long-term capacity, to calculate master production planning, etc.
- *Source*. This process covers activities related to procuring goods and services to meet planned and actual demand. This process includes aspects related with

obtaining, reception, inspection and storage material, supplier's quality certification, supplies logistics, contracts with suppliers, etc.
- *Make*. This process includes activities related to transforming products into a finished state to meet planned or actual demand. This process deals with request and receipt materials, production and assessment of goods, packaging, storage and shipment of goods, changes on productive process, equipment and resources management, control quality management, production scheduling, short-term capacity management, etc.
- *Deliver*. This process provides finished goods and services to meet planned or actual demand, for example, order, transportation, and distribution managements.
- *Return*. This process is related with returning or receiving returned products and extends into post-delivery customer support.

Lambert et al. (2005) argue that in supply chain management processes, this framework integrates issues related to purchasing, operations, and logistics. The SCOR model does not focus on relationships with customers and suppliers but on transactional efficiency.

3 Supply Chain Integration

Sharing relevant information among members of supply chain is a key factor for success. When retailers don't share sales and inventory status data with other partners in the supply chain, supply chain management is merely devoted to inventories management. In those cases, inventories act as shock-absorbing means to smooth demand fluctuations. This situation generates inefficiencies in the supply chain, especially in production scheduling, inventory control and delivery plans (Lee et al. 2004). Therefore, any inefficiency in a link of the chain will affect the whole chain. According to Wagner and Sweeney (2010: 26) "the whole chain is only as strong as its weakest link". Frequency, quantity and quality of shared information among partners supply chains are crucial aspects as well.

Lee and Whang (1998) define the types of information that partners supply chain should share to get a greater coordination and efficiency:

- *Inventory level*. When information about inventory level of partners supply chain is shared, inventory levels of the chain as a whole are reduced, decreasing space needs and costs. In addition, replenishment production and shipment can be scheduled more accurately (Devaraj et al. 2007).
- *Sales data*. Normally, sales data variance is lower than order data variance. When firms share only information about order data with suppliers, demand can be distorted creating "the bullwhip effect". According to Lee et al. (2004), this refers to the phenomenon where orders to the supplier tend to have larger variance than sales to the buyer (generating demand distortions). Such distortions propagate upstream in an amplified form (creating variance amplification). Suppliers incur in excess raw materials and manufacturing costs, inefficient

utilization and overtime along with increasing warehousing expenses and additional transportation costs due to inefficient scheduling and higher shipping rates.

- *Order status for tracking/tracing*. Allowing customers to know about order status within the supply chain increases control and confidence. Sharing this information improves service customer to a large extent.
- *Sales forecasts upstream to suppliers*. Forecasts act as notification of future orders to suppliers. Suppliers can use this information to develop a production plan. However, when customers behave in an opportunistic way by communicating suppliers higher than real forecasts, there is a risk of inefficiency. According to Lee et al. (1997), Frohlich and Westbrook (2001) and Devaraj et al. (2007), sharing real demand forecasts from customers provide suppliers more visibility planning for capacity and material requirements minimizing inefficiencies.
- *Production/Delivery Schedule*. Getting to know suppliers' production schedules in advance, helps customers improve production schedules, reduce forecast uncertainty and enable more detailed production quantity and timing as well as reliable delivery (Lee and Whang 1998; Lancioni et al. 2000; Wei and Krajewski 2000; Krajewski and Wei 2001; Devaraj et al. 2007).
- *Other information sharing*. Lee and Whang (1998) argue that information such as performance metrics (product quality data, lead times, queuing delays at workstations, service performance, etc.) and capacity information is susceptible to be shared for optimising purposes.

The bullwhip effect is, from the above, the one that has attracted more attention in literature. Lee et al. (2004) suggest four sources of bullwhip effect: demand signal processing, rationing game, order batching and price variations. Demand signal processing refers to the situation where demand is non-stationary and retailers use past demand information as predictors of future demand generating distortion of demand information. The production schedule based on this distorted information is inefficient. This distortion effect amplifies as the number of partners in the supply chain increase.

The rationing game refers to the strategic ordering behavior of buyers when supply shortage is anticipated. This phenomenon appears in product markets during the growth phase of the product life-cycle when demand exceeds supply. Lee et al. (2004) illustrate this source through a product whose demand potentially exceeds supply due to limitation in production capacity or uncertainty of production yield. The manufacturer would ration the supply of the product to satisfy the retailers' orders. However, each retailer will order more units to secure the delivery what the retailer would order if the supply of the product is unlimited.

Order batching refers to retail buyers' decision process. The main goal is to gain economies in pricing and transportation, so they use traditional inventory management models to calculate optimum size of the order. This situation is usual when fixed order cost is nonzero, so ordering in every period is uneconomical

(Lee et al. 2004). These authors consider that this phenomenon is a consequence of the periodic review process and the processing cost of purchase transactions.

Finally, the last source of bullwhip effect is price fluctuations. This source refers to non-constant purchase prices of the product (for example, manufacturer's trade promotions with price discounts). In these cases, the buyers want to capitalize on the discount offered during a short period of time. According to Lee et al. (2004), it causes irregular production schedule for manufacturers, unnecessary inventory costs and distorted demand information. These authors suggest reducing the frequency and depth of promotions.

Supply chain intends to minimize the bullwhip effect by increasing demand visibility along supply chain (Wagner and Sweeney 2010). In these situations, Information and Communications Technologies play a central role. ICTs allow firms to increase the volume and complexity of information sharing with their partners in the supply chain as well as to share real-time supply chain information (sales data, inventory level, delivery status, production planning and scheduling). In addition, ICTs facilitate the alignment of forecasting and scheduling of operations between partners of supply chain, allowing better inter-firms coordination (Prajogo and Olhager 2012; Ghobalkhloo et al. 2011). Auramo et al. (2005) suggest that the use of ICTs is crucial, especially in fast-moving industries for managing contemporary supply networks. Levary (2000) and Auramo et al. (2005) argue that ICTs in supply chain management provides a reduction in cycle time, in inventories levels, a minimization of the bullwhip effect, and improvement in the effectiveness of distribution channels. According to Simchi-Levi et al. (2003: 267) the aims of ICTs in supply chain management are: (1) providing information availability and visibility, (2) enabling a single point of contact for data, (3) allowing decisions based on total supply chain information, and (4) enabling collaboration with supply chain partners. Therefore, the literature refers to ICT as an essential enabler of supply chain management activities (Mabert and Venkataramanan 1998).

Of all ICT, Internet and the Web have a central role in a supply chain management. They may have an important impact on business integration and collaboration (Rabinovich et al. 2003; Sanders 2007). It is a most cost-effective means of driving supply chain integration as it allows rapid growth of web-based information transfer between partners in the supply chain (Watson et al. 1998; Johnson and Whang 2002; Gunasekaran and Ngai 2004). Such possibility of acquiring and sharing information easily and fast increases process transparency (Deeter-Schmeltz and Norman-Kennedy 2002; Ronchi 2003; Michelino et al. 2008).

In this sense, according to Cooper et al. (1997), Giménez and Lourenço (2008: 311) define e-SCM "as the impact that the Internet has on the integration of key business processes from end user through original suppliers that provides products, services, and information that add value for customers and other stakeholders". Johnson and Whang (2002) also argue that combination of Internet and supply chain integration is transforming many business processes within supply chain management. So important are ICT in supply chain management that these authors

have defined e-business as the Internet use to get supply chain integration (Johnson and Whang 2002). In the next section, some aspects about e-business in supply chain management are presented.

4 e-Business in Supply Chain Management

In current global markets, firms are forced to satisfy more demanding customers in order to obtain competitive positioning and competitive advantages. This involves changing traditional business structures into a flexible and integrated Supply Chain Management strategy. The development of ICT's and the Internet World Wide Web (WWW) have increased and speeded up the flow of information between companies and customers creating e-business partners. Internet has augmented the richness of communications through greater interactivity between the firm and the customer (Watson et al. 1998). Therefore, the main impact of Internet on SCM is the possibility of sharing a large amount of information along the supply chain in real time, including operations, logistics and strategic planning data. This fact provides firms with more visibility, improving production planning, inventory management, and distribution (Devaraj et al. 2007; Sanders 2007).

The value creation process extends beyond the boundaries of the firm, and involves integrating business processes among partners of the chain (Stevens 1989; Tan et al. 1998). Therefore, integration, collaboration and coordination across individual firm functions and throughout the supply chain are fundamental (Sanders 2007). ICT, Internet and e-business are enabling supply chain collaboration and coordination (Sanders 2012). Nowadays companies seeking to integrate their business processes implement Information Technologies (IT) in order to be more flexible and responsive. This way companies are able to break traditional barriers between departments or functions and reduce unnecessary efforts. In this section, essential e-business integration solutions will be analyzed according to their importance, benefits and contribution for SCM as well as the role of information systems to achieve e-business objectives.

Supply chain integration started way before Internet. In the seventies, inter-organizational systems such as Electronic Data Interchange (EDI) were used for coordination with suppliers and customers. In the airline industry, computer reservation systems were used to communicate with travel agencies and other customers. EDI can be defined as the transmission of standardized business documents through a shared format between applications of two involved agents in an economic transaction. This technology became a standard before the Internet turned into an extended technology allowing transactions at reduced costs (Walton and Gupta 1999; Sanders 2007). However, technologies before Internet were based on proprietor standards, implementation was rather complex especially in early stages with complicated management interfaces and important trade-offs. Internet has allowed to overcome all of these disadvantages (Frohlich 2002; Johnson y Whang 2002) due to the increase in flexibility of an affordable technology for

small and medium firms (Lancioni et al. 2000; Zhu and Kraemer 2002; Zhu et al. 2004; Devaraj et al. 2007; Sanders 2007).

According to Wagner and Sweeney (2010: 29), e-business solutions try to enhance supply chain effectiveness and efficiency through the automation of business processes, due to their interoperability and open-standard settings for the transfer of data among firms (Bailey and Rabinovich 2001; Rabinovich et al. 2003; Sanders 2007). The adoption of e-business standards provides higher transparency, improves information quality, facilitates collaboration and supply chain information sharing, lowers prices from suppliers, automates requisition and purchase order creation, integrates payment processes, improves speed and flexibility, diminishes transaction costs, increases customer service levels, reduces investments in supply chain inventories, and helps organizations to develop plans for the more effective management of sourcing and logistics (Neef 2001; Essig and Arnold 2001; Deeter-Schmelz et al. 2001; Auramo et al. 2005; Johnson et al. 2007; Devaraj et al. 2007; Sanders 2007; Wagner and Sweeney 2010; Prajogo and Olhager 2012).

Johnson and Whang (2002) and Lee and Whang (2002) distinguish three categories in e-business applications: e-commerce, e-procurement, and e-collaboration. E-commerce refers to the use of the Internet for identifying and responding quickly to changing customer demands. E-procurement refers to the use Internet for procuring direct o indirect materials and value-added services. Finally, e-collaboration refers to the use of Internet for business-to-business interactions (e.g., information sharing and integration, decision sharing, process sharing, and resource sharing). Some authors separate upstream and downstream processes, distinguishing supply and demand integration, or e-procurement and e-fulfillment (Frohlich 2002; Frohlich and Westbrook 2002; Muffato and Payaro 2004). In detail:

- *E-commerce*. Is the denomination used for the trade of goods and services that takes place electronically over the Internet (Dolber et al. 1998). Supply chains of information goods and physical goods have undergone deep changes by the use of Internet as E-commerce involves dealing with high volumes of individual customers. E-commerce grants firms the possibility to develop economic activities electronically (on line) and exchanging information in real time with suppliers coordinating supply chain activities.
- *E-procurement*. Johnson and Whang (2002) argue that Internet offers a natural platform to facilitate corporate supply. Internet facilitates efficient negotiations between customers and suppliers through some pre-established protocols. E-procurement involves dealings with firms in the marketplace with numerous customers and suppliers together in virtual markets seeking information to buy and sell goods and services. Nowadays, e-procurement has automated and streamlined numerous corporate purchasing processes under an online basis (Sengupta 2001; Sanders 2007; Wagner and Sweeney 2010). It reduces operational costs, improves process efficiency, delivers greater centralized control over purchasing and increases negotiation power with suppliers through order consolidation. In relation with supplier evaluation, e-procurement solutions

provide data warehousing capabilities. This ameliorates supplier performance more efficiently (Giménez and Lourenço 2008; Wagner and Sweeney 2010).

- *E-collaboration*. Refers to supply chain coordination through Internet. This process includes activities such as information sharing and integration, decision sharing, process sharing, and resource sharing (Johnson and Whang 2002). E-collaboration improves customer service, reduces inventory levels, increases agility and flexibility, and lowers bullwhip effect (Seidmann and Sundararajan 1997; Cachon and Fisher 2000; Lee et al. 2000; Yu et al. 2001; Zhao et al. 2002; Dejonckheere et al. 2004; Devaraj et al. 2007; Sanders 2007; Swafford et al. 2008; Prajogo and Olhager 2012). However, members of supply chain share information on the basis of a mutual trust among them (Fossas-Olalla et al. 2010). In this context, Sanders (2012:320) argues that (1) a cooperative relationship results in the development and sharing of joint objectives; (2) managerial strategies to get coordination are easier to implement; and (3) cooperation and coordination result in the elimination of duplication of efforts among parties, so supply chain productivity is increased. Fossas-Olalla et al. (2010) and Prajogo and Olhager (2012) suggest some challenges on the firm relationships with their suppliers: long-term relationships with their suppliers instead of short-term contracts (based on power relationships), reduction of base of suppliers, election of supplies considering factors such as quality, services, delivery time, etc. instead of only price, and consideration of suppliers as a strategic part of the firm, etc.
- *E-fulfillment*. This concept is even broader than e-commerce which increases efficiency for order placement and fulfillment (Giménez and Lourenço 2008). Pyke et al. (2001) describe the difficulties of effectively executing e-fulfillment as it involves sharing these data among partners of the supply chain in real time. Lee and Whang (2001) present a framework for making e-fulfillment effective based on a good use of information and leveraging of existing resources. E-fulfillment requires the use of data batches such as customer's order and inventory levels, and online manufacturing levels in order to benefit from cost saving, shorter order cycle time, inventory reduction, among others (Gunasekaran and Ngai 2004) (Fig. 1).

This massive information and data exchange in real-time is commonly stored and managed by information systems. These systems integrate, coordinate and manage all supply chain management information between suppliers and customers. Enterprise Resource Planning (ERP) was firstly used to connect different functions of a firm, but nowadays, these systems also connect to other supply chains from partners. ERP allows the flow of information between all business functions inside the boundaries of the firm and manage the connections to other partners of the supply chain (Sanders 2012). ERP systems incorporate different information in a centralized database that is accessed by all partners supply chain for improved decision making. It allows every function of supply chain to store and retrieve information in real-time as well as to avoid information delays and distortions along the supply chain and increase transparency and to reduce

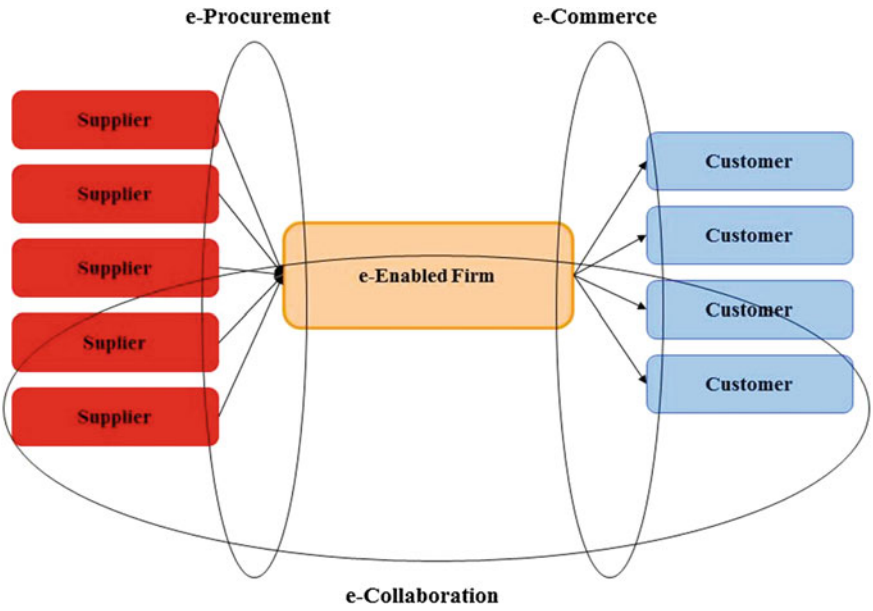

Fig. 1 E-business forms and their impact on the supply chain (*source* Johnson and Whang 2002)

bullwhip effects (McAfee 2002; Wagner and Sweeny 2010; Sanders 2012). In this sense, Gunasekaran and Ngai (2004) define ERP as systems that connect different functions within a firm (such as marketing, operations, sourcing, logistics) as well as a firm's supply chain partners (such as suppliers, distributors, third party logistics providers), enabling the partners to share information such as order status, product schedules, sales records, plan production, logistics and marketing promotions.

Other system that allows collaboration among partner supply chain is Efficient Consumer Response (ECR). This tool improves certain demand's customer attention, through an automatic replacement system of purchased stock in the customer's facility. The information about this purchase is sent simultaneously to every supplier of purchase good. These suppliers plan and carry out purchase good replacement at the necessary moment. With the use of Vendor Managed Inventory (VMI) suppliers are responsible for managing the inventory located at a customer's facility. In this situation, the supplier is the owner of the inventory until it is purchased by the customer. So, the supplier provides the inventory, places replenishment orders, and places its exposition (Sanders 2012). Hence, the supplier has greater control over their product. With the use of VMI is necessary that suppliers and customers work together, collaborate and develop mutual trust.

According to some authors, Continuous Replenishment (CR) improves the relationships with suppliers compared to VMI as inventory levels are easily managed on line. When this information and knowledge are shared among

members of supply chain, it refers to Collaborative Planning, Forecasting and Replenishment (CPFR). With this tool, all members of supply chain plan together. In this sense, Sanders (2012) argues that CPFR is a collaborative process of developing forecasts and plans jointly with supply chain partners. According to this author, CPFR brings value to their customers, allows risk sharing of the marketplace among different partners, and improves performance (Sanders 2012:230). Hence, supply chain partners jointly set forecasts, plan production, replenish inventories, etc. All these tools and systems facilitate sharing information among members of supply chain by connecting different functions within a firm (such as marketing, operations, sourcing, and logistics), as well as allowing collaboration among partners and mutual trust.

5 Conclusions

Our main aim based on the comprehensive and vast literature reviewed in this paper is to clarify topics, concepts and processes widely discussed with a methodological approach. We present a practical and useful framework on e-business integration defining the "pillars" of its success and their implications on SCM. In this paper we also describe different internal processes inside the SCM; moreover, we define how data integration (supplier-customer) among different partners is focused on the type of information shared; the importance of e-commerce, e-procurement, e-collaboration, e-fulfillment, the significant and collaborative role of Information Technologies (IT) in this integration process and operational benefits and costs benefits as a result of this integration. We also determine the type of information that should be shared among partners to improve coordination and efficiency.

According to managerial implications, practitioners must understand the importance of integration among companies considering SCM integration as an element of differentiation and competitiveness. Concepts like coordination, availability and quality of information have become an essential tool nowadays. This grants the company the possibility to compete in global markets in real time no matter the location of the supplier or customer. E-business will be the way to make ordinary business all over the world. If companies want to participate and be part of this globalized market they will be forced to integrate their SCM processes. To achieve this, information technology (IT) plays a crucial role to be implemented by managers. Information systems are capable to manage business and process information of partners or collaborative participants (customer–suppliers) sharing while transfer of information gives companies the chance to satisfy and response to demanding market needs in a short period of time.

For practical implication of SCM on e-business, supply chain management must be considered more than ever as a dynamic and flexible process in which all activities among partners of the supply chain are coordinated "in real time" to satisfy the final customer and maximize total supply chain profitability. The

development of ICT's and the Internet World Wide Web (WWW) have diminished the physical barriers allowing the company to participate in a global market. This new requirements demand the integration of key business processes from end users through original supplier connecting several activities among firms.

In this paper we attempt to provide a descriptive e-SCM framework as a practical guidance for future analysis on this topic. We suggest that Future researches should focus on the use and impact of external software applications commonly known as Bolt-ons; these applications are added into a core information system and used specifically to integrate particular SCM areas or processes. Their contribution on e-business should be considered and tracked in future.

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Creating Business Value Through e-Business in the Supply Chain

Paul Humphreys, Brian Fynes and Frank Wiengarten

Abstract The use of e-business applications has reshaped the structure of organizational supply chains. e-business applications have enabled supply chain organisations to collaborate with each other in order to meet performance goals. Although recent studies have identified that e-business applications support and enable supply chain management and improve an organisations' performance, the interrelationship between the applications and performance is still a relatively underexplored research area. In addition, it has been questioned in recent literature whether or not e-business applications directly improve organisational performance. Researchers are frequently emphasising the importance of complementary factors that are essential for e-business applications to create value within an organisation and its supply chains. This chapter proposes a model of the relationship between e-business applications, organizational factors and performance within the context of supply chain management. Based on a literature review and the theoretical underpinnings from the resource-based view (RBV) and contingency theory we provide a novel perspective that expands our understanding of the necessary conditions and underlying mechanisms for firm resources to create business value within the supply chain environment.

Keywords e-business · Supply chain management · Business value · Contingency theory · Resource based view

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1 Introduction

Despite the importance to researchers and practitioners of how e-business contributes to supply chain performance, there is still an on-going debate about the extent of its business value and how to measure e-business value within the supply chain context (Mithas et al. 2011). A number of researchers have applied the resource-based view (RBV) and contingency theory to investigate supply chain related e-business value with mixed results. Researchers have started to recognize that e-business value is closely associated with the synergies created from information technology (IT)/information systems (IS) and a variety of complementary organisational factors, which might be an alternative way to explain these mixed results. Frequently, e-business value research is underpinned by RBV, which is commonly applied to understand the relationship between IT and organisational performance, in general, and supply chain performance in particular. RBV provides a strategic framework to assess the competitiveness of organisational resources. However, despite a significant amount of research during the past two decades, the results on IT business value (ITBV refers to the degree to which IT creates value for the firm) are rather mixed; there is still an on-going debate about whether or not e-business improves supply chain performance.

Whilst some studies argue that this inconsistency is caused by methodological and conceptual issues, others suggest that the conceptualisation and inclusion of complementary resources is a key missing factor in explaining the mixed results. According to Teece (1986), complementarity refers to how one resource might influence another, and how this relationship affects a firm's competitive position or performance. Although conceptually recognised, research on complementary resources and how they affect e-business resources has not been extensive (Nevo and Wade 2010). Thus, many researchers have repeatedly stressed the importance for continuing research into this research domain (Agarwal and Lucas 2005; Kohli and Grover 2008). Contingency theory, which can be applied to analyse the interrelationship and complementarity between resources is proposed as one approach to provide a clearer appreciation of the e-business value process (e.g. Chan and Reich 2007; Weill and Olson 1989).

This chapter is set out to develop a holistic approach to e-business value in the supply chain context. Based on an extensive literature review, along with the RBV and contingency theory, we suggest that firms might be able to gain significant performance improvements if e-business resources are in alignment with additional organisational and supply chain factors (i.e. supply chain strategy, supply chain processes, supply chain culture, supply chain structure). We believe that the conclusions drawn from this chapter will be valuable in assisting researchers and practitioners in understanding the complex ITBV process within the supply chain environment.

2 Literature Background

Several researchers (Agarwal and Lucas 2005; Kohli and Grover 2008) suggest that there remains a need to further examine the IT performance relationship. According to Ravichandran and Lertwongsatien (2005), *although studies have found that IT affects firm performance, the underlying mechanisms by which IT relates to firm performance remain under examined in both the IS and the management literature …. the underlying theories to explain why and how IT contribute to firm performance have undergone a paradigm change, creating a need for more current examination* (p. 238). Previous research in e-business value has identified contradictory results on whether or not e-business improves firm performance. In addition to the measurement and methodological issues, some researchers have considered that the assessment of e-business resources in isolation from its setting may be the reason for some negative results (Melville et al. 2004; Wade and Hulland 2004). Conceptual and a few empirical studies indicate that the inclusion of complementary resources in combination with e-business resources might have a significant effect on firm performance (e.g. Zhu 2004; Ray et al. 2005; Zhuang and Lederer 2006).

The identification of the extent and conditions under which IT in general and e-business and supply chain management, in particular, impact on firm performance is of great importance for the research community (Agarwal and Lucas 2005; Kohli and Grover 2008). As a result, a proliferation of research articles on e-business value has been produced (Kohli and Grover 2008). Within this research domain the issue of resource complementarity has been identified as a possible explanation for the mixed performance results of IT. According to Teece (1986), complementarity refers to how one resource or factor might influence another, and how this relationship affects a firm's competitive position or performance. Melville defined complementary resources as: *when synergies between IT and other firm resources exist, we call the latter complementary organisational resources* (p. 294). According to Wade and Hulland (2004), *the issue of complementarity is an important one since it implies a more complex role for IS resources within the firm. In the same way that IT software is useless without IT hardware* (*and* vice versa), *IS resources play an interdependent role with other firm resource*s (p. 123). The importance of complementary resources and their roles in the creation of IT business value seem to have been recognised. However, research on complementary resources and how they work together with IT *has not been extensively developed* (Wade and Hulland 2004, p. 123). It is still relatively unknown what role complementary resources play in the e-business performance relationship. Some researchers have identified a mediating role while others have identified a moderating role for complementary resources (Zhu 2004; Sanders 2007). According to Zhang (2007), *since the indirect effect of IT has become more and more influential in current thinking of how to evaluate and manage IT resources more empirical evidence is needed to ascertain this effect* (p. 141). From a supply

chain management perspective, the implementation of e-business resources within the supply chain setting and its effect on performance is of pivotal importance (McIvor and Humphreys 2004).

2.1 e-Business Value and Supply Chain Management

The emergence of the Internet and the development of Web-based information technologies and systems, referred to as e-business technologies, have radically changed the face of today's business world. There is no doubt that e-business has transformed to a significant extent not only industries but societies as a whole, by the way in which consumers and business interact. Typically, business transformation is most visible at the business to consumer (B2C) side of e-business. However, the biggest change due to e-business is between companies, in terms of business-to-business transactions (B2B).

IT in conjunction with e-business applications have been widely used to transform business processes and activities and to create entirely new business models and new markets. According to Laudon and Laudon (2004), *the Internet and related technologies make it possible to conduct business across firm boundaries almost as efficiently and effectively as it is to conduct business within the firm* (p. 9). As a result, e-business has changed the way companies conduct their business and the way in which they compete with each other. Companies are increasingly using e-business applications such as electronic auctions, electronic catalogues, and customer relationship management applications to streamline their business processes (Oh et al. 2012). This is especially the case for systems implemented in the supply chain setting. As Boone and Ganeshan (2007) suggested: *Just like the telegraph and the railroads in the mid-nineteenth century, the Internet, and indeed, digitally enabled technologies, has fundamentally changed how businesses mange their supply chains* (p. 1195). Volkswagen AG, Europe's largest car manufacturer, for example, has transformed its business processes and activities through e-business applications and digitized its whole supply chain. Through the implementation of an online suppliers platform called 'VW Group Supply.com' (www.vwgroupsupply.com), in the early summer of 2002, Volkswagen is now handling 90 % of its purchasing activities over this online platform. Applications such as online catalogues, capacity management, and contract negotiations have transformed the way in which Volkswagen is conducting its business activities.

In the introductory article, "The frontiers of e-business technology and supply chains" for the special issue of e-business and supply chain management (SCM) in the *Journal of Operations Management*, Boone and Gameshan (2007) noted, *e-business technologies have permeated every supply chain process. Products are collaboratively designed on the Web; procurement software and exchanges have streamlined purchasing and reduced transaction costs; ERP systems have codified, standardized, and automated data storage and retrieval; collaborative technology*

has enhanced supply chain visibility and has made the distribution of products and services efficient; and communication technologies have improved customer relationships and marketing strategies (p. 1195). Swaminathan and Tayur (2003) highlight the possible contributions of e-business in supply chain management. They identified that e-business has contributed and changed the following supply chain areas: Procurement and supplier selection, visibility and information sharing, distribution and pricing, customisation and postponement, and decision technology. Through the implementation of e-business technologies, companies are able to seamlessly share information working in a collaborative supply chain environment and ultimately making the supply chain more efficient. The introduction of web-based IT such as e-business can be viewed as a cornerstone to integrate supply chain partners. However, still relatively little is known about how IT impacts on supply chains and ultimately how they affect performance (Sanders 2007). According to Rai et al. (2006), *in spite of the key role of IT in the SCM phenomenon, thus far limited scholarly investigation has been undertaken by the Information Systems community* (p. 226).

Research into the effects of IT on firm performance is referred to as IT business value research, and belongs to the management information systems research field. Melville et al. (2004) define IT business value as *the organisational performance impacts of information technology at both the intermediate process level and the organisation-wide level, and comprising both efficiency impacts and competitive impacts* (p. 287). Within this research domain, a proliferation of research articles has been published (Kohli and Grover 2008). IT business value research has tested the performance effects of a variety of IT applications such as procurement systems, e-business, ERP, and EDI on numerous process-, firm-, and country-performance indicators (Chan 2000).

In recent years, IT business value research has been a very active research domain, with a proliferation of research articles published (Agarwal and Lucas 2005; Kohli and Grover 2008). Apart from a few studies that were carried out in 1970s, research on IT performance became popular at the end of the 1980s. A detailed review of the early studies on IT and performance can be found in Kauffman and Weill (1989). As research on IT performance started to accumulate, some of the studies were unable to identify a link between investments in IT and improved productivity at the economy level (Strassmann 1985). This has been referred to controversially as the "productivity paradox" and was identified at the end of the 1980s and more so in the 1990s (Brynjolfsson 1993). Brynjolfsson (1993, 2003) highlighted that earlier studies suggest an apparent IT investment paradox in terms of economy-wide productivity, productivity of IT capital in manufacturing and in the service sector. According to Chan (2000), *although the IT productivity paradox was originally defined at the economy level and some studies have carried out at national and industrial levels, … . researchers have addressed the productivity question at the organisational level* (p. 226).

Brynjolfsson (1993) suggests the following four reasons for the controversial results: measurement error (inappropriate measurement of output), time lags (the delay of several years before benefits of IT investment materialise), redistribution

(of IT enabled performance benefits), and the mismanagement of IT resources (Mahmood and Mann 2005). In a more recent review of the IT business value literature, Devaraj and Kohli (2003) identified the following methodological issues to explain some of the variance in the observed results: anecdotal and small sample data, cross-sectional data analysis that limits the ability to examine lag effects as well as causal connections between IT adoption and organisational performance, limited sets of control variables that account for extraneous factors such as market conditions, and aggregated units of analyses, where it is difficult to accurately observe the impact of organisational initiatives. In addition, Quan et al. (2003–2004) proposed that the issue of causality and correlation might provide an alternative explanation of the reasons for the productivity paradox. Their argument, which is supported by numerous other studies, is that most of the IT impact studies relied on regression statistics to detect the IT productivity relationship. According to Quan et al. (2003–2004), *Since regression techniques have no inherent directional implications, a significant relationship does not automatically imply causality. Hence, a positive correlation between productivity or performance measures and IT investment measure should not automatically be taken as evidence of the IT impact on productivity or performance as, explicitly or implicitly, implied in many studies* (p. 125).

An in-depth review of the literature has identified that around the beginning of the new millennium, IT business value research started to accept the end of the productivity paradox phase and began to use confirmatory approaches, such as confirmatory surveys, to test theory based hypotheses. It is the general consensus that the productivity paradox has been solved and it is commonly accepted that IT does improve productivity (Kohli and Grover 2008). Kohli and Grover (2008) argue: *the 'whether' of IT value research now lies in the past. Many recent studies demonstrate that our interlude with the productivity paradox was an artifact of time and measurement. We have now accumulated a critical mass of studies that demonstrate a relationship between IT and some aspect of firm value, whether it be financial (e.g., ROI), intermediate (e.g. process-related) or affective (e.g., perception-related)* (p. 26). However, researchers still have not found an universally accepted method to detect IT business value. Moreover, there are still controversial issues about the impact of IT on performance, such as the conceptualisation of the IT construct and the performance measurement process (Devaraj and Kohli 2003; Sanathanam and Hartono 2003).

In terms of methodological approach, in the early exploratory stages of IT business value research, many empirical studies were based on case studies and exploratory surveys (Kettinger et al. 1994; Quinn and Baily 1994). Quinn and Baily (1994), for example, used a case study approach and identified a link between IT infrastructure and strategic IT investments on a firm's productivity in the service sector. According to Mukhopadhyay et al. (1995), most of the earlier IT business value studies relied on case studies and did not have a strong theoretical background. Even several years later, Zhu and Kraemer (2002) still criticised past IT business value research for relying on case studies and anecdotes, with few empirical studies to measure Internet-based initiatives or the scale of their impact

on firm performance. However, the review indicates that since 2000 there has undergone a methodological change in conducting IT business value research, with researchers focusing on theory-testing and further development. Since then, the majority of the studies have been empirically based and used a confirmatory survey approach in the form of questionnaires to test their IT performance models (Byrd and Davidson 2006; Huang et al. 2006). Meanwhile, this coincides with the increasing application of the RBV in IT performance literature (Gordon et al. 2005; Ravichandran and Lertwongsatien 2005; Ray et al. 2005; Zhu and Kraemer 2005). For instance, all of the recent studies that applied the RBV used a survey to either confirm or reject their hypotheses about the IT performance relationship, except for one study that used a case study approach (Gordon et al. 2005).

Within the operations management domain researchers have recently started to investigate e-business performance effects in supply chain settings (e.g. Rai et al. 2006; Devaraj et al. 2007; Sanders 2007). Researchers have looked at a mixture of applications supporting supply chain processes and applications (Clark and Lee 2000; McAfee 2002; Kent and Mentzer 2003; Ranganathan et al. 2004; Jin 2006; Wu et al. 2006), which might be categorised into supply-side and buyer-side applications (Barua et al. 2004; Devaraj et al. 2007).

Barua et al. (2004), for example, empirically investigated the indirect performance benefits of online information capabilities through supplier- and customer-side digitisation on perceptual financial performance. They identified that while most firms are lagging in their supplier-side initiatives relative to the customer-side, supplier-side digitisation has a strong positive impact on customer-side digitisation, which in turn leads to better financial performance. Furthermore, both customer and supplier readiness to engage in digital interactions are shown to be as important as a firm's internal digitisation initiatives, implying that a firm's transformation-related decisions should include its customers' and suppliers' resources and incentives.

A more recent study by Devaraj et al. (2007) investigated the impact of e-business technologies on operational performance through production information integration in the supply chain. Their analysis showed that there was no direct benefit of e-business technologies on performance; however, these technologies supported customer and supplier integration. Furthermore, they identified that supplier integration was found to positively impact cost, quality, flexibility, and delivery performance; however, there was no relationship between customer integration and performance. In conclusion, this means that they identified a relationship between e-business and supplier integration, which leads to better performance (Devaraj et al. 2007). Similarly, Thun (2010) highlighted the importance of IT for the integration of global supply chains.

Within the context of supply chain management, researchers have applied transaction cost economics (TCE) to explore various performance aspects of e-business (e.g., Yao et al. 2007; Radhakrishnan et al. 2008). TCE proposes that the boundaries of a firm are defined by cost minimizing choices, whether to make a product/service in-house or buy products/services beyond a firm's own boundaries (Coase 1937). In addition to the costs of the acquired resources, TCE suggests that

organizations also have to consider the costs and resources required to effectively coordinate with suppliers to mitigate the risks associated with external sourcing (Handley and Benton 2009). Previous research has highlighted that e-business can significantly reduce these costs associated with buyer–supplier coordination (Bardhan et al. 2006). Wiengarten et al. (2012), for example, has identified that e-business indirectly creates business value through enabling and increasing information sharing, incentive alignment and joint-decision making. By adopting these practices, it is suggested that companies could significantly reduce their transaction costs and subsequently gain substantial operational performance improvements.

These examples provide further reinforcement that e-business is more likely to affect performance indirectly through contextual factors such as information integration, shared knowledge, and collaboration (Ray et al. 2005; Devaraj et al. 2007; Sanders 2007). To measure the performance benefits of e-business in the supply chain the majority of researchers employ subjective operational performance indicators such as inventory turnover, lead times, productions costs, delivery speed (McAfee 2002; Kent and Mentzer 2003; Silveira and Cagliano 2006; Devaraj et al. 2007; Sanders 2007). Most of these studies have adopted the traditional approach of measuring operational performance in the dimensions of cost, quality, delivery and flexibility (Vickery et al. 1993; Devaraj et al. 2007). Other less common approaches use indicators such as financial performance measures (Barua et al. 2004).

In line with the results from the e-business value literature review, e-business is identified to significantly improve an organisation's supply chain performance and ultimately its overall performance. When the impact of e-business on supply chains is measured using intermediate performance indicators, this leads to more conclusive and consistent results, as IT investments are expected to be related to process performance (Ravichandran and Lertwonsatien 2005). Measuring the performance impact of resources, whether it be the processes they are implemented in or the activities they are meant to support, is also confirmed by Barney (2001) in his seminal research on the RBV.

3 Development of a Coherent e-Business Value Model Within the Supply Chain Context

3.1 Resource Based e-Business Value Research

The RBV has been widely accepted as the predominant theory in e-business value research (Ravichandran and Lertewongsatien 2005; Bardhan et al. 2006; Dehning et al. 2007). Barney's (1991) work on RBV provides practical guidance about the identification of value adding firm resources'. Resources are defined as all assets, capabilities, organisational processes, firm attributes, information, knowledge, etc.,

controlled by a firm, enabling the firm to conceive off and implement strategies that improve its performance (Daft 1989, cited in Barney 1991).

Two assumptions are made in RBV. Firstly, firms within an industry (or group) may be heterogeneous with respect to its strategic resources. Secondly, these resources may not be perfectly mobile across firms, and thus heterogeneity can be long lasting (Barney 1991). A firm is said to have a competitive advantage (CA) when it implements a value creating strategy, which is not simultaneously being implemented by any current or future competitor. In addition, it has a sustainable competitive advantage (SCA) when other firms are unable to duplicate the benefits of this strategy. Therefore, resources need to exhibit the following attributes to be a source of SCA: valuable, rare, imperfectly imitable, and non-substitutable (subsequently referred to as the VRIN conditions, Bowman and Collier 2006).

RBV has helped in providing clarification with regard to the controversial argument concerning whether or not IT resources can be a source of long-term performance improvements. Wade and Hulland (2004) stated the following arguments for applying RBV in the ITBV domain: (1) by defining sets of resource attributes, RBV facilitates the specification of IT resources; (2) by using the same set of resource attributes, IT resources can be compared with one another, and perhaps more importantly, can be compared with non-IT resources; and (3) RBV sets out a clear link between resources and SCA through a well-defined dependent variable, providing an useful way to measure the strategic value of IT resources.

Following Barney's (1991) classification of organisational resources, researchers have commonly categorised IT resources into technological and human IT resources (Melville et al. 2004). Previous research has identified that some human IT resources such as top management commitment are more likely to fulfil Barney's VRIN resource attributes, whilst technological IT resources such as computer software and hardware do not (Mata et al. 1995; Powell and Dent-Micallef 1997). In other words, the more complex are the IT resources, or the more non-IT factors, such as knowledge or managerial capabilities, are considered as being part of the IT resources, the more likely these resources fulfil Barney's VRIN requirements and are a source of SCA (Wade and Hulland 2004).

These findings have also been supported by a recent extension of RBV in the form of dynamic capabilities (Teece et al. 1997; Eisenhardt and Martin 2000). The dynamic capability approach tests the degrees to which specific resource-level processes improve a firm's competitive position by operationalising the independent variable as the interaction of a specific resource and a specific dynamic capability and testing its relationship with performance (Helfat and Peteraf 2003; Winter 2003; Wang and Ahmed 2007; Ambrosini and Bowman 2009). Previous research has identified that these complex capabilities, such as net-enablement or electronic business capabilities, are developed over time through dynamic interactions that can be a source of SCA (e.g. Wheeler 2002; Zhu and Kraemer 2002).

Although RBV and its extensions have helped in understanding the performance differences in e-business resources, it still has its limitations in acknowledging the role of complementary resources and explaining the mixed results of e-business value. In this article we suggest that the alignment between e-business and

complementary resources is what ultimately makes e-business a potential competitive enhancing resource for supply chain management (Oh et al. 2012).

Advances in the understanding of the research domain have highlighted the crucial role of complementary resources in the e-business value creation process. Many researchers now believe that in order to understand the impact of IT on firm performance, IT resources should not be evaluated in isolation; instead, IT and other non-IT complementary resource must be considered in the value creation process (Wade and Hulland 2004, Kohli and Grover 2008). Although resource complementarity has been conceptually highlighted by previous studies based on RBV, a detailed review of complementary IT resources is still missing.

3.2 Assessing Resource Complementarity Through Fit: The Contingency Theory

The importance of complementary organisational resources in affecting e-business value can also be elucidated through the concept of fit or alignment based on the contingency theory (Fiedler 1964; Nadler and Tushman 1980; Drazin and Ven 1985). Some researchers have started to apply the contingency theory to examining the interrelationships and fit between IT, organisational variables and organisational performance (e.g. Weill and Olson 1989; Chan and Reich 2007). Fit can be defined as *the degree to which the needs, demands, goals, objectives, and/or structures of one component are consistent with the needs, demands, goals, objectives, and/or structures of another component* (Nadler and Tushman 1980, p. 45). Contingency theory contends that the optimal organisational design is contingent upon various internal and external constraints. The design of an organisation and its subsystems must "fit" not only with the environment but also between its subsystems (Fiedler 1964). Essentially, contingency theory conjectures that performance is a consequence of the fit between factors such as structure, people, technology, strategy, and culture (Tosi and Slocum 1984) and that misalignment results in problems, dysfunctions and/or inferior performance (Nevo and Wade 2010). In the research area of management information systems, the general assumption is that organisational performance is contingent on a number of variables such as strategy, structure, size, task, and individual characteristics. The implication is that the better the "fit" or complementarity between these variables, the better the performance (Weill and Olson 1989).

3.3 Definition and Classification of Complementary Resources: Supply Chain Factors

In order to synthesise and analyse complementary ITBV studies, a categorisation of complementary resources has to be developed. Looking specifically at supply chain resources (called factors in contingency theory), these are generally referred to as non-IT resources that are complementary to e-business. A number of studies have discussed non-IT resources or organisational factors. For example, Melville et al. (2004) suggest that complementary organisational resources include non-IT physical capital resources, non-IT human capital resources, and organisational capital resources. Weill and Olson (1989) identify organisational strategy, structure, size, task, and individual characteristics to be important variables that may affect the relationship between IT and organisational performance. Non-IT resources are also referred to as complementary business investments (Brynjolfsson 2003), organisational practices (Brynjolfsson and Brown 2005) or intangible assets (Brynjolfsson et al. 2002), consisting of various organisational work practices, human capitals, skills, processes, structures and cultures.

These examples of complementary resources demonstrate that diverse conceptions are currently used to define and classify organisational factors. In addition, the nature of a supply chain requires not only discussing organisational factors that are within the boundaries of the focal company, but also factors along the supply chain. We define supply chain factors through the following characteristics. Firstly, supply chain factors are non-IT resources. Secondly, supply chain factors can be viewed as the firm's subsystems that can be managed to work in conjunction with e-business to achieve organisational goals. Thus, they are differentiated from environmental factors outside the boundaries of the supply chain, which also affect organisational performance, but are less likely to be controlled by the firm. Thirdly, supply chain factors are seen to be complementary to e-business resources. Without supply chain factors, e-business resources alone have little direct impact on performance, or the full potential of e-business value is less likely to be realised. When e-business resources are combined or interacting with complementary supply chain factors, synergies in the forms of higher e-business value will be generated (Melville et al. 2004; Ray et al. 2004). Consequently, we refer to supply chain factors as non-IT resources within a supply chain that complement e-business to affect organisational performance.

To extend our understanding of supply chain factors, we have investigated several organisational studies that examine and classify organisational factors, within the e-business value process (Chandler 1962; Leavitt 1965; Waterman et al. 1980; Scott Morton 1995). Drawing on this research, we classify supply chain factors into *supply chain strategy, supply chain processes, supply chain structure,* and *supply chain culture* as a means to complement e-business. Taking each of these in turn, supply chain strategies have been conceptualised into various categories, such as transaction based versus collaborative, or responsive versus efficient supply chains (Fisher 1997; Frohlich and Westbrook 2001; Choi et al. 2012).

Supply chain processes, such as the procurement process, are activities or procedures designed to support business operations in order to create value to customers (Hammer 1996). In e-business value studies, a typical process-related research topic would be to examine the performance impact of a process redesign required to complement IT applications (e.g., Grover et al. 1998). Supply chain structure refers to the degree and type of horizontal and vertical differentiation, mechanisms of coordination and control, formalisation, and centralisation of power (Greenwood and Hinings 1993). Supply chain structure is very similar to supply chain strategy because structural decisions might have a strategic impact. Organisational and supply chain culture can be defined as patterns of shared values, beliefs, and assumptions underlying behavioural norms between organisational members (Schein 1984). In e-business value studies, there is evidence that the outcome of IT investments might be affected by organisational culture (e.g. Gold et al. 2001).

3.4 Creating e-Business Value in the Supply Chain

As outlined in the previous section, e-business resources can be divided into the commonly accepted categories of technological and human e-business resources. Technological e-business resources are part of a company's physical capital resources such as plant and equipment, geographical location, access to raw materials and the physical technologies. Technological e-business resources can be further divided into e-business infrastructure and specific business applications. Human e-business resources are part of a firm's human capital (expertise and knowledge), including both technical and managerial knowledge (Melville et al. 2004). We have categorized supply chain factors into: supply chain strategy, supply chain processes, supply chain culture and supply chain structure. They are non-IT factors, within the realm of the supply chain, that complement e-business to affect organisational performance. In applying the RBV and contingency theory we predominantly take a strategic view on e-business value. Subsequently, we specifically focus on possible significant long-term performance improvements through e-business and supply chain resources.

By combining RBV with contingency theory we extend previous e-business value models to acknowledge not only the pivotal role of complementary supply chain resources, but also the role of fit or alignment between those variables based on contingency theory. By clarifying key supply chain factors, we provide guidance to identify the general context in which e-business creates business value. Thus, the *context insensitive* problem of RBV (Brush and Artz 1999; Priem and Butler 2001) can be addressed and the *practical usefulness* of the VRIN conditions can be enhanced. Rather than looking at e-business resources in isolation without considering the context in which they are applied to, we propose that business value is dependent on multiple contingency variables.

Theoretically, the concept of resource complementarity needs further development. The literature review indicates that e-business value researchers have generally accepted and applied this concept to improve our understanding of how e-business and specific supply chain factors are combined to create synergies, capabilities and business value. However, it can be argued that the concept of resource complementarity is underdeveloped with regard to how well it grasps the complexity and interrelatedness of creating synergies, capabilities and business value. Currently, many studies have predominantly used resource complementarity to conceptualise the synergies between IT and one single organisational factor. Such pairwise relationships do not seem to be able to adequately describe and contemplate the synergies created from e-business interacting with organisational factors and supply chain factors simultaneously. In order to coherently understand the complex process of e-business value creation, it is essential to focus on resource co-alignment between all supply chain resources affected by e-business resources rather than the pairwise associations. This view is seen to be consistent with and supported by several e-business value studies (Clegg et al. 1997; Bergeron et al. 2001, 2004; Brynjolfsson 2003; Pollalis 2003). For example, Pollalis (2003) states that the complexities of how multiple factors intertwine to produce positive business performance can be understood best from a holistic perspective. Similarly, Brynjolfsson (2003) emphasises a holistic approach to e-business value, exemplified by Wal-Mart, that has sustained its higher performance over other retailers as a result of the mutual reinforcement between its IT and organisational factors.

Therefore, e-business value should be understood as the value created by the co-alignment between e-business and other organisational (i.e., supply chain) factors simultaneously (Rosenzweig et al. 2011). Based on the definition of fit in contingency theory, fit/misfit refers to the degree of consistency/inconsistency among contingency variables such as e-business and supply chain factors. The highest-degree of consistency will generate maximum positive synergies, while the highest-degree of inconsistency will bring about maximum negative synergies (Premkumar et al. 2005). In contrast with co-alignment/misalignment, pairwise associations, as discussed previously, can be divided into two types: *pairwise fit* and *misfit,* which refer to the consistency and inconsistency between e-business and one single supply chain factor, respectively. In prior e-business value studies, it is assumed that pairwise fit rather than misfit will generate resource complementarity. However, from the contingency perspective, pairwise fit is not necessarily associated with co-alignment, since e-business and other supply chain factors are interrelated. In addition, resource complementarity, conceived as pairwise association, is not necessarily associated with co-alignment and positive synergies. This chapter proposes that the VRIN conditions (within the RBV) and long-term performance improvements should be viewed from a holistic perspective, rather than in relation to a single resource or a pair of resources. Thus, it can be argued that the level of e-business value depends on the degrees of co-alignment among e-business and supply chain factors simultaneously.

4 Conclusions

The intention of this chapter was firstly to review and identify the current state of knowledge in supply chain related e-business value research. We have identified that despite conceptual and methodological progress researchers are still searching for a more coherent way to conceptualise and measure e-business value. Whilst some researchers have highlighted the importance of complementary resources, our literature review has identified empirical evidence that further underlines the pivotal role that complementary organisational resources play in e-business value research.

Based on the findings of the literature review, combined with RBV and contingency theories, we have proposed a novel perspective on the development of e-business value within the supply chain context. This should provide a theoretical basis for future empirical studies to develop testable hypotheses that could further advance e-business research. We take an integrated view on e-business value and specifically acknowledge the importance of complementary supply chain factors in the e-business value development process. We have therefore proposed that e-business resources that are in alignment with a firm's supply chain factors form e-business-enabled capabilities that can be a source of long-term performance improvement. Most importantly, we have highlighted the importance of how co-alignment among e-business resources and other supply chain factors will generate positive synergies and capabilities that will significantly improve organisational performance, which is yet to be empirically examined in future e-business value research.

Consequently, the findings from the literature review will also be an useful tool for practitioners. Practitioners can use our suggestions to reconsider the business value evaluation process of their e-business systems. In order to evaluate e-business systems, managers should not solely focus on e-business resources but more importantly on organisational factors, such as their supply chain, that are directly and indirectly affected by e-business. These propositions may guide managers in the performance evaluation process to ultimately make more informed decisions with regard to their e-business systems.

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Issues in the Design and Evaluation of e-Supply Chains

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Abstract E-procurement, e-tailing and e-marketplaces are examples of e-business applications that have revolutionized certain processes in supply chains and have given rise to e-supply chains. Although the advantages are numerous, adopting inappropriate e-business applications may prove detrimental. Hence, firms contemplating on e-business adoption must understand the impact of such a venture not only on their own firm but also on the supply chain. It is obvious that numerous factors, situations and context must be considered in designing and evaluating the performance of e-supply chains. This calls for research into the understanding of supply chain dynamics in the presence of e-business. In this chapter, via an in-depth literature review on e-business, supply chain management, e-supply chains and supply chain performance, we discovered that the Contingency Framework lends itself well as the basis on which to mould our proposed framework. Combining this with Innovation Diffusion Theory, we then posit the contingency framework for the design of e-supply chains and the e-supply chain evaluation framework. The applicability of the frameworks is illustrated in a case study that is conducted at a brake manufacturer which is on the verge of embarking into e-business. The chapter concludes with discussions on the implications and limitations of the frameworks.

Keywords e-Supply chain Structure · Supply chain scenarios · Contingency framework · Innovation diffusion theory

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1 Introduction

A supply chain is a network of facilities and activities involved in delivering a product from raw materials through to the customer. It is concerned with planning, coordinating and controlling the flow of material, parts and finished goods from the suppliers to the customer. It involves two distinct flows through the organization that is, material and information. In the early days of discussion about supply chain management the spotlight was primarily centred on management of the above mentioned flows within a single company. The primary objective of supply chain management according to Spekman et al. (1998) is to leverage the supply chain to achieve the lowest initial purchase prices while assuring supply. Today's focus of supply chain management, however, is one of cross-company planning and implementation. Under this new paradigm, supply chain management is redefined as a process for designing, developing, optimising and managing the internal and external components of the supply system, including material supply, transforming materials and distributing finished products or services to customers, that is consistent with overall objectives and strategies. The overall objectives of a supply chain are cost reduction and customers' satisfaction whilst supply chain strategies are long term plans that are developed and implemented in order to fulfil the objectives. This new way of managing the supply chain will link all partners in the chain including departments within an organization and the external partners including suppliers, carriers, third party companies and information system providers. The partners must all work together to make the whole supply chain competitive (Lummus and Vokurka 1999). Since competitive advantage is now derived through supply chains instead of single companies, it is imperative that supply chains are continually analysed and monitored so as to improve its performance hence increasing its competitiveness.

One of the most important technological enabler that will provide supply chains with the much-needed advantage over their competitors is extensive use of Information and Communication Technology (ICT). The availability of highly flexible and inexpensive ICT such as the Internet presents new possibilities in restructuring the supply chains for better performance (Christiaanse and Kumar 2000). Easy and cheap access to the Internet in particular has opened up a multitude of possibilities for individual firms and their supply chains. Numerous Internet enabled supply chain management systems and Enterprise Resource Planning (ERP) systems are available including SAP, Oracle, Peoplesoft, and IBM e-business (Gunasekaran et al. 2002) that exemplifies this situation. It has made it possible for companies to redesign their business processes and participate in e-business applications such as e-procurement, e-sell, e-auctions, e-marketplace and infomediaries, to name a few.

This has given rise to the so-called e-supply chains (van Hoek 2001, Hafeez et al. 2010) and hence e-supply chain management. Although the advantages are numerous, indiscriminate use of improper e-business applications may prove detrimental. This is highlighted by Phan (2003) via a case study at Intel who

discovered that only through a proper needs analysis can e-business applications be used to leverage a company's business. The Intel example illustrates the idea of appropriateness of e-business applications and the organizations that adopt them. In the context of this chapter, drawing parallels form the work of Khazanchi (2005), the word appropriateness refers to the conditions under which firms in a supply chain should consider itself a likely candidate for e-business implementation. In this sense, appropriateness is an issue of determining the readiness of firms for e-business implementation. It also raises the question of fit between the current conditions faced by the firms in the supply chain and the nature of e-business considered for adoption and its impact on the individual firm's performance and also on supply chain performance. Problems that arose in the Amazon supply chain (van Hoek 2001) also highlights the importance of finding an approach that will enable firms to properly design and manage their e-supply chains. The problems faced by Amazon are logistical factors, related to supply chain performance. Products were not delivered on time or were out of stock. van Hoek (2001) stated that even though with e-business technology in place, Amazon still faced these problems because it fail to manage its supply chain with an underlying business model that includes an e-supply chain. This calls for research into the understanding of supply chain dynamics in consideration with e-business. Research into this area is important so that firms contemplating on e-business adoption will have a clearer picture of the impact of such a venture not only on their own firm but also on the supply chain as a whole. It is obvious that this line of enquiry may lead us to uncover numerous factors, situations and context that will have impacted the design and hence the performance of the supply chain. The questions that subsequently arise are: How do we classify the factors, situations and context that were uncovered? Is there a unifying framework that can be used to design and evaluate an e-supply chain? How can the framework be applied? To answer these questions, it is necessary to conduct a literature review on e-supply chains, supply chain management and supply chain performance. In order to propose the framework, forays into organization theory will lead us to contingency theory which lends itself naturally as the unifying framework. In this chapter based on the considerations described, we posit the use of contingency theory framework for the design and evaluation of e-supply chains. The implications and limitations of the framework will also be discussed via a case study. The chapter concludes with discussion for further work.

2 Literature Review

The literature review is divided as follows. First we review the literature on e-supply chains by tracing its evolution from supply chains and its impact on supply chain processes and performance. We also define the meaning of e-supply chain

design and evaluation. Next we focus our literature review on contingency theory and technology adoption. This is followed by a brief review on supply chain performance.

2.1 e-Supply Chains

2.1.1 Definition and Scope

e-supply chains have been defined in various ways. For our purposes we adopt the general definition of an e-supply chain as merging the two fields of Supply Chain Management (SCM) and Internet. As such it includes any Internet- enabled activities that make it possible for the virtual integration of the entire supply chain. In other words e-supply chains are web based supply chains (Akyuz and Rehan 2009). In doing so, here e-supply chains mean the adoption of e-business practices in supply chains. E-business refers to the use of Internet based computing and communications to conduct and support business processes. Categories of e-business applications or practices includes e-marketplaces where buying and selling of goods and services takes place; inter-organizational systems that facilitates inter and intra-organization flow of goods, services, information, communication and collaboration; and customer service which includes sales and customer service support (Cagliano et al. 2005). E-business applications via inter-organizational information systems such as B2B trading systems, B2B support systems, electronic funds transfer and shared databases have also stimulated and enhanced the advantages promised by using supply chain strategies such as vendor managed inventory (VMI), collaborative planning, forecasting and replenishment (CPFR) and efficient consumer response (ECR).

2.1.2 Tracing the Evolution

A supply chain can refer to the entire network of organizations involved in converting raw materials and information into products and services, and the consumption of and the disposal of those products and services. Alternatively, it can also be seen as a set of relationships among suppliers, manufacturers, distributors and retailers that facilitates the transformation of raw materials into final products (Melnyk and Swink 2001; Beamon 1999). The sequence of processes and activities involved in the complete supply chain includes everything from product design through materials and component ordering through manufacturing and assembly onto warehouse and distribution until the finished product is in the hands of the final owner.

Managing the supply chain effectively and efficiently can improve competitiveness by reducing uncertainty and enhancing customer service. The underlying

philosophy for the emphasis on supply chains is attributed to the fact that corporations had to respond to the changing business trends that had taken place from the periods covering the 1950s until today. To understand this evolutionary process it would be pertinent to review the historical aspects of production and operations management activities. Filipini (1997), Chandra and Kumar (2000) and Lancioni et al. (2003) give excellent reviews regarding this historical perspective of the supply chain. The salient features of this evolution can be described as in Table 1.

As can be observed from the table, e-supply chains began its evolution from the 1990s. It was made possible by technology and with the availability of pervasive devices such as RFID and mobile devices such as smart-phones.

2.1.3 e-Supply Chain Design and Evaluation

The design of a supply chain must be suited to the supply chain performance objectives. Although supply chain design was not explicitly defined, the adopted definition was implied in numerous literatures on supply chain management. It can be gathered that researchers have equated supply chain design as supply chain configuration and investigated issues pertaining to the location of supply chain facilities such as deciding on the location or addition of a distributor (Bashiri and Tabrizi (2010)), partners selection (Crispim and de Sousa 2010) and stock placement (Funaki 2012). Some also investigated process management and

Table 1 Evolution of supply chain management activities (adapted from Filipini 1997; Chandra and Kumar 2000; Lancioni et al. 2003)

Period	Characteristics
1950s	• Era of industrial or factory management • Final aim is to maximize productivity of labour
1960s–1970s	• Production management broadens to include service systems and become known as operations management. • Manufacturing systems focused on Materials Requirement Planning (MRP)
1970s–1980s	• Appearance of the strategic orientation to manufacturing; integration of functions such as product design and manufacturing. • Introduction of JIT, TQM and ISO standards • Manufacturing systems were focused on Manufacturing Resource Planning II (MRP II) • Japanese production innovations made its mark on the global scene
1990s–2000	• Increased national and international competition • Increase in strategic alliances; greater information sharing between vendors and customers; coordination of processes across many sites; ability to react quickly to market changes • Integration: upstream with suppliers and downstream with buyers; the use of ERP systems • Use of Internet to monitor operations and reduce costs; the use of VMI, ECR and CPFR; the rise of e-procurement, e-collaboration, e-commerce, e-marketplace, e-logistics

information sharing, and partner and service provider management initiatives as part of supply chain design issues (Speiera et al. 2011). Thus in designing e-supply chains, issues like facilities location, the type of buyer–seller relationships, inventory locations, choice of suppliers and partners and the type of e-business adopted are the main factors of focus. Evaluation of an e-supply chain refers to the analysis done on a supply chain with the objective of evaluating the supply chain performance. In this chapter we will show that the proposed e-supply chain design framework is moulded into an evaluation framework via the concept of e-supply chain scenarios. This approach is similar to the approach adopted by Vlajic et al. (2012).

2.2 Contingency Theory

Contingency theory provides an interesting way in viewing activities in a supply chain. It is an approach to the study of organizational behaviour in which explanations are given as to how contingent factors such as technology, the external environment and culture influence the design and functioning of organizations. The term contingency theory was coined by Lawrence and Lorsch (1969). They argued that the amount of uncertainty and rate of change in an environment impacts the development of internal features in organizations. In other words, there were several contingencies located in the environment that stipulated the most appropriate organizational structure. In their classic work, the case studies developed based on six companies in a plastic industry, highlighted their argument that in complex environments the organization developed separate departments to confront these differing environmental segments. These separate departments however created integration problems between them and the rest of the departments in the respective organizations. It is concluded therefore that the extent that the companies could differentiate to the level required by the environment and at the same time integrate these different departments into collective action determine the organizations success rate.

Perhaps the essence of contingency theory is best captured by Jay Galbraith (1977) who stated that there is no one best way to organize and any way of organizing is not equally effective. Intertwined with the concept of contingency theory, is that of organization structure. Organizational structure has been defined and classified in a number of ways in the literature. One simple way differentiates between organizations on the dimension of centralization or decentralization (Stock et al. 1998). However among the most often used categorization is due to Mintzberg (1979). In his seminal work, he identified five different types of organizational structure namely the simple structure, machine bureaucracy, divisionalised form, professional bureaucracy and adhocracy. Each structure can be described according to eleven attributes that include coordinating mechanism, formalization of behaviour and decentralization.

There are a number of approaches in contingency theory. On one hand, there are studies that investigate the interactive effect of contextual variables such as size and organizational structure variables such as centralization on particular areas of organization performance (Kraft et al. 1995). On the other hand there are also studies that investigate the effects of contingent variable such as technology on structure variables without investigating the effect on performance (Vickery et al. 1999). Jordan and Tricker (1995) for instance, found out that the operations of different organization structures are supported by different information systems. It is purported by Kraft et al. (1995) that the original idea in contingency theory is that different structural contingencies produce different types of performance. In their work, they remarked that there might be some structural contingencies that are more important for social performance (measured in terms of absenteeism or strikes) while others are more important for economic performance (measured in terms of returns on investment, etc.). Likewise, they stipulated that a particular structural contingency is unlikely to provide best performance for both categories of performance.

2.2.1 Models and Frameworks for e-Supply Chains: A Question of Fit

Although information technology can reduce both transaction costs and production costs, research indicates that supply chain performance is enhanced only when there is a fit between the type of supply chain relationship and the inter organizational information systems (IOIS) employed. This idea of fit between IOIS and the type of supply chains is explored by da Silveira and Cagliano (2006). Differentiating between stable supply chains and dynamic supply chains, their findings suggested that the choice of IOIS must be in accordance with the companies' product portfolio and supply chain configuration.

The issue of fit is also illustrated by Disney et al. (2004), whom had investigated five different scenarios of e-supply chains. The methodology utilised is to analyse the results from the playing of the Beer Game to determine the extent of bullwhip in the various e-business scenarios described. They discovered some surprising results. Chief among them is that the implementation of the VMI scenario had both the worst inventory holding costs and the worst bullwhip effect. It was discovered that the reason that contributed to this is that the players had problems in implementing the VMI concept. Disney et al. (2004) concluded that ICT in the form of e-business adds a degree of complexity to human decision-making. The players had difficulty in coping even when well-defined protocols are provided. They also reiterated that although ICT offered the opportunity for greater supply chain transparency, it also created a more complex environment that posed difficulties in decision-making. Besides this the experiment conducted showed that players might be too ambitious in implementing the e-business strategies which had led to counter productivity reflected in the results of the simulation. Finally the authors concluded that this scenario is close to reality where companies "may often over stretch their capabilities and resources in implementing new technologies that are

either too advanced for their needs or are inherently too resource intensive to implement and operate".

Au and Ho (2002) examined the use of B2B e-commerce in the apparel manufacturer supply chain. In the case study conducted they discovered that on the technical side ICT do support supply chain integration and subsequently facilitate supply chain management. However, on the managerial side, they highlighted that before engaging in the virtual business world, it is important that supply chain members have a thorough understanding of the impact of e-commerce on inter-firm relationships. Failing to do so may resulted in failure of the e-commerce initiative and also might prove harmful to the existing offline business.

Davies and Garcia-Serra (1999) addressed two key components of the supply chain—electronic commerce (e-Commerce) and the role of small-to-medium-sized enterprises (SMEs). The fifteen SMEs involved in their study form a diverse

group, representative of the South Wales and wider UK industrial base. Focusing on three case studies, the researchers discovered that SMEs need to look inwardly at their own requirements before "simply implementing technology for technology's sake". The SMEs should also concentrate on areas of potential benefit such as the stages of pre-contract (i.e. research and design, negotiation) and post-contract (i.e. customer service). Besides this, education and training are crucial in ensuring that SMEs understand the role of e-Commerce.

Electronic Markets (EMs) as a business model influences the way transactions are carried out and also the structure of supply chains. Wang et al. (2007, 2011) investigate electronic logistics marketplaces, which are defined as an electronic hub using web-based systems that link shippers and carriers together for the purpose of collaboration or trading. In their research, they characterize three different operational models or ELM structures. By doing so, the decision makers in logistics can identify the best structure or configuration which best suited their particular application.

Skjøtt-Larsen et al. (2003) originally hypothesized that electronic marketplaces and supply chain management might not fit because the latter advocates close relationships between partners in the supply chain. However, via a classification that they developed the authors proposed that different types of supply chain relationships will require different types of electronic marketplaces based on different procurement portfolios.

Still on the subject of supply chain relationships, Williams et al. (2002) proposed that close collaborative relationships between supply chain partners in 'traditional supply chains' will give way to more 'efficient' relationships in e-supply chains. As such, arms length relationship might prove to be more beneficial in an e-supply chain scenario as compared to the close collaborative one. E-supply chains thus pose a challenge for managers and leaders to strike a balance between both types of relationships depending on the situation and circumstances of the e-supply chain.

The above review illustrated that different factors affect supply chains in different ways. This had given rise to various supply chain types such as the responsive and efficient supply chains (Fisher 1997) and the hybrid supply chain

(Christopher and Towill 2000). The fact that the performance of a supply chain is contingent upon several factors implies the possibility of using contingency theory in explaining the dynamics of supply chains.

In the following subsection we trace the use of the supply chain structure concept. This concept forms an important element in the design of e-supply chains as will be explained later in Sect. 3.

2.2.2 Supply Chain Structure

The term supply chain structure has appeared sporadically in the literature. However, lately, the term is being used quite often sometimes with different connotations and meanings. The most obvious use of the term is in reference to the number of tiers and players in a particular supply chain. In this mode, the term supply chain structure can be thought of as referring to the physical layout of the chain (Catalan and Kotzab 2003; Childerhouse and Towill 2000; Hines et al. 2000; Cohen 2000; Melnyk and Swink 2001). Moon (2004) identified the term supply chain structure with the physical layout (number of tiers) and the interdependencies between the members. Harland (1997) implicitly assumed that similar supply chain structures in different geographical areas should refer to similar products and similar physical layouts. Beamon and Chen (2001) classified supply chain structures into convergent, divergent, conjoined and general based on its physical layout, which is related to the type of product supplied via the supply chain.

However besides this common use of the term there are instances when the meaning is more specific in nature. Ernst and Kamrad (2000) for instance considered four types of supply chain structures namely, rigid, postponed, modularized and flexible that are defined, according to the combined levels of modularization and postponement. Although they did not formerly define the term, Griffiths et al. (2000) talked about outcomes of supply chain structure in terms of flexibility, responsiveness and resource utilization, by examining the role that is played by customer demand.

Chow et al. (1995) on the other hand, developed a more rigorous definition that was developed from that of organization structure. So did Lambert et al. (1998) who talked about supply chain structure as a network of members in a supply chain as well as the links between them. An attempt to classify supply chain structures was made by Hagelaar and van der Vorst (2002). Using extent of complexity and differentiation of structural linkage as the basis for characterizing the supply chain, they identified four structures that they described as the round table structure, the decomposed structure, the multi-focus simple structure and the multi-focus network structure. They then went on to identify the type of Life Cycle Assessment that is suitable for the particular structure. A sample of definitions associated with supply chain structure is given in Table 2. This table is not intended to provide a comprehensive review of supply chain structure definitions; rather the purpose here is to highlight some of the contrasting uses of the term.

Table 2 Definitions associated with supply chain structure

Authors	Definition/context of use
Chow et al. (1995)	Developed the definition from that of organization structure. Dimensions of the structure of supply chain relationships are defined as follows: 1. Supply chain formalization 2. Supply chain intensity 3. Supply chain frequency 4. Supply chain standardization 5. Supply chain reciprocity
Lambert et al. (1998)	Mentioned that the supply chain structure is the network of members and the links between members of the supply chain. Goes on to define three primary structural aspects of a company's network structure: 1. Members of the supply chain 2. Structural dimensions of the network 3. Different types of process links across the supply chain
Stock et al. (1998, 2000)	Specified two constructs defining supply chain structure. They are: The classification of how the firm's supply and distribution channel is governed–as a network, hierarchy or market Geographic dispersion of the supply chain
Cohen (2000)	Supply chain structure determines the location, capacity, connectivity and mission of the cells in the supply chain network
Griffiths et al. (2000)	Talked about factors that influence supply chain structures in terms of flexibility, responsiveness and resource utilization
Ernst and Kamrad (2000)	Characterized four supply chain structures defined according to the levels of modularization and postponement
Childerhouse and Towill (2000)	Although not explicitly defined, the term was used in the context of the physical layout of the supply chain Talked about supply chain structure from a single firm's perspective as being made up of upstream suppliers, downstream suppliers, technology/resource suppliers, after market suppliers and customers
Hagelaar and van der Vorst (2002)	Basically identified supply chain structures via the level of supply chain cooperation taking place. Identified four supply chain structures based on two dimensions: 1. The extent of complexity of the supply chain as defined by the number of functions that are included in the partnerships. 2. The differentiation of the structural linkage between the partners in the supply chain, defined as the number of consult structures between partners which influence the decision making process

Besides Contingency Theory, another important theory that is relevant to the understanding of the issues related to the design of e-supply chains is the Theory of Technology Adoption. This is the subject of the next section.

2.3 Theory of Technology Adoption

The advancements in information technology and the Internet have spurred a lot of interest amongst researchers, policy makers and practitioners. Merging the Internet and supply chains has resulted in e-supply chains. There are a number of theoretical frameworks that has been used by researchers to investigate the adoption and diffusion of information technology and new technologies by the business community. Among the most used models are the technology adoption models which are mainly associated with the Technology Acceptance Model (TAM) (Davis 1989) and its variants like TAM 2 and UTAUT and also The Innovation Diffusion Theory (IDT) (Rogers 1983). Rogers' theory is valuable because it is able to explain the factors which influence the adoption of an innovation (which can be a new technology) and the manner in which these innovations are disseminated over time. By leveraging on both the Technology Acceptance Model and The Innovation Diffusion Theory, El-Gohary (2012) discovered internal factors like owner skills, available resources, organizational culture, organization size and external factors like competitive pressures, government influence, market trends and national infrastructure have significant impact on e-marketing adoption.

Aguila-Obra and Padilla-Melendez (2006) worked on investigating the organizational factors that affect internet adoption. In the ensuing literature review that was carried out, they discovered that there were numerous internal and external factors that affect internet adoption. Among the external factors are pressure from competitors, customers or suppliers; the role of government (incentives); partners' alliances; technological infrastructure; technology consultants; image of Internet technology and users' expectations. The internal or organizational factors that have been studied mostly include: IT users' community; organizational structure; firm's processes; firm size; technological capabilities of the organization's members; the technological and financial resources available; the culture of the organization; process of selecting and implementing the IT; management backing and support for the project; and the project leader.

2.4 Supply Chain Performance and e-Supply Chain Performance

The effectiveness of any supply chain management practice will be manifested in improved supply chain performance. Performance measurement is a topic that is often discussed but rarely defined (Neely et al. 1995). This is especially true in the area of supply chain performance. The issues plaguing the area of supply chain performance are mainly concerned with the types of measures or measurement systems to be employed and also the issue of measuring the supply chain's performance as opposed to individual player's performance.

In general terms, the measures of supply chain performance are centred around increased customer satisfaction and reduced overall costs (Spekman et al. 1998). However these broad measures can be broken down into different measures or metrics. Lee and Billington (1992) commented that there were no performance measures for the complete supply chain. They gave examples that showed the effects of using inappropriate measures and the conflicts that resulted from incompatible metrics. Inappropriate measures and the failure to consider the whole chain in evaluating performance seems to be two of the most common errors done in evaluating the performance of the supply chain. An effort to handle this issue has been taken up by the Supply Chain Council in collaboration with Advanced Manufacturing Research and the consultant company of Pittiglio Rabin Todd and McGrath (PRTM) (Stewart 1995). They came up with the Supply Chain Operations Reference model (SCOR) that can be used by participating companies to benchmark their supply chains. The supply chain metrics given priority in this model include supply chain response time, financial costs and assets, quality and customer satisfaction. They are claimed to give optimum results when used as a set. Other metrics considered include cash-to-cash cycle time, total logistics cost and value added per employee. The issue of the 'right' performance measures and/or measurement systems in the supply chain is still hotly debated. Morgan (2004) whilst reviewing the evolution of performance measurement systems, highlighted the inadequacies of the traditional measures such as gross profit, return on sales, work in progress, inventory, process time, order lead time, percentage of rework etc. which was termed measures based on retrospective data. He likened its use to "driving a car by looking in the rear view mirror". He asserted that although these measures are so "entrenched that they would never be replaced", it is useful to examine the other performance measures to see how good they really are, in terms of helping management to adopt a proactive posture. Hence, besides the traditional method of performance measurement as described in the previous section, the trend now is moving towards new measurement systems that are contingent on several factors.

Christopher and Towill (2000) highlighted the fact that as supply chains evolve over time so does the performance measures used. The evolution occurs in areas such as the supply chain philosophy, supply chain type and performance metrics, including market winners and qualifiers criteria. They assert that the performance of different types of supply chains had to be measured via different types of measures.

Propounding the need for a new measurement system is van Hoek (1998). Since supply chain management is changing the way firms look at their operations and their outlook on competition, van Hoek (1998) suggested a new approach to measuring the performance of a supply chain. He states that the selection of relevant measures and measurement approach would depend on the strategic context and operational contribution of the players in the supply chain competitiveness. For example if the contribution of the players is in the area of costs, relevant measures may be part per minute. On the other hand if the player is a retailer that has reached the second stage of market penetration and is focused in

delivering customer service, then the measures could be fill rates and response times. A player who is focused on integrating the entire chain might use measures such as level of commitment of individual players in the chain and percentage of customisation achieved with respect to customer order.

Beamon (1999) points out the difficulty in choosing the right supply chain performance measures mainly because of the complexity of supply chains. She points out that an effective performance measurement system should have certain characteristics that include: inclusiveness (measure all pertinent aspects of the supply chain), universality (allow for comparison under various operating conditions), measurability (data required must be measurable) and consistency (measures consistent with organization goals). Beamon (1999) also criticized the use of cost as a single performance measure. According to her this type of measure is not inclusive. This means that the supply chain might be operating under minimum cost but might demonstrate poor customer response time, or is not flexible enough to meet random fluctuations in demand. In her work she suggested the use of a supply chain measurement system that emphasize on three separate types of performance measures: resource measures (R), output measures (O), and flexibility measures (F). Among the measures categorized under resource measures are: total cost, distribution cost, manufacturing cost, inventory and return on investment (ROI). Output measures include sales, profit, fill rate (target fill rate, average item fill rate), on time deliveries (product lateness, average lateness of orders, average earliness of orders, percent on time deliveries), backorder/stock out (stock out probability, number of back orders, number of stock- outs, average backorder level), customer response time, manufacturing lead-time, shipping errors, customer complaints.

However, recent research into measures and metrics for e-supply chains has underlined the need for specific measures for e-supply chains (Sambasivan et al. 2009). In their work, Sambasivan et al. (2009) captured six metrics that reflect the efficiency, effectiveness, and strategic benefits of e-supply chain initiatives. These six metrics encompassed the time and cost dimension, data reliability, invoice and payment, e-response, e-document management and web enabled services. Focusing on the business performance of e-supply chains in Malaysia, Hafeez et al. (2010) asserted that supply chain strategy must be in line with the e-business adoption of the organization. By doing e-business will enhance the organization's ability to create value proposition, increase revenues and operational performance. They proposed that the organization's performance is measured via financial measures, efficiency measures and coordination measures.

It is evident that supply chain performance albeit e-supply chain performance is a rapidly developing research area in its own right. As the field of supply chain management is a multifaceted one, so is the subject of supply chain performance. The concept of performance across the entire supply chain as opposed to that of a single firm in the chain had opened up a number of interesting research problems and areas. The question of the type and range of measures, for instance are subjects worthy of research.

The above review had highlighted the various measures used to indicate the performance of the supply chain. The most common especially in operational models is the cost function. A performing supply chain is one that is performing at optimum cost with respect to certain constraints each peculiar to their respective problem definition.

3 Positing the Framework

The literature review reveals that contingency effects are present in supply chains and that contingency theory is relevant in as much that it can be used to establish causality between the various factors that affect supply chain performance (Mukhtar et al. 2002) and in explaining the theoretical underpinnings of supply chain management (Stonebraker and Afifi 2004). This issue of contingency was also discussed by Caputo et al. (2004) for e-supply chains when they mentioned that "e-supply chain performances are influenced by the network organizational structures, by the criteria adopted to manage relationships among involved actors, and by the critical activities that the leading company performs."

In organization theory, the variables related to organization structure are well known. However, the case is not particularly that straightforward for e-supply chains. Thus following the tenets of contingency theory, it is necessary to identify and group the variables into practice variables, contingency variables, supply chain structure variables and supply chain performance variables as follows.

3.1 Practice Variables

These variables refer to the type and level of e-business practice in supply chains and it closely follows the taxonomy proposed by van Hoek (2001). Type here refers to the use of information obtained via e-business practices, which is categorized as ranging from operational to strategic. Whilst level refers to the scope of e-business practices in supply chain processes which ranges from partial/fragmented to integral. Integral e-business practice refers to the use of e-business in all supply chain processes, whilst partial or fragmented use refers to limited usage. For example, e-tailing, which is only limited to selling of products online is an example of partial/fragmented level of e-business practice. This designation results in four possible combinations of e-business practice variables corresponding to each of the four quadrants in Fig. 1. Obviously this taxonomy can be refined by respectively refining the type and level components of the variables.

E-procurement and e-tailing that only involves automation of purchasing and selling transactions will fall in the bottom left hand quadrant. E-marketplaces that provide only e-auctions will also fall into this category, whilst e-marketplaces that provide strategic functions could fall into the two top quadrants depending on

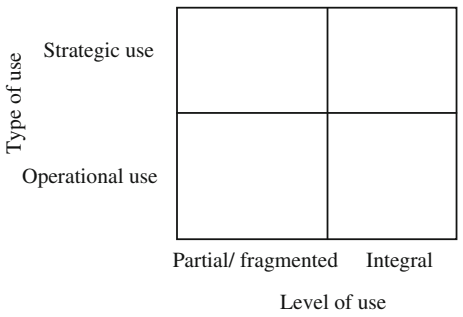

Fig. 1 Type and level of e-business practices (adapted from van Hoek (2001))

whether the level of use is partial or integral. E-collaboration in terms of sharing of resources and that involves all functions in the supply chain will fall in the top right hand quadrant.

3.2 Contingency Variables

Variables grouped under this category are those that have a certain amount of influence over the overall choice of e-business practices, which subsequently affect the performance of a supply chain. This means that the overall choice of e-business practices (type and level) is contingent on these factors. The supply chain performance will in turn be contingent on the choice of the e-business practices.

A non-exhaustive list of contingency variables gathered from the literature (based on contingency theory and theory of technology adoption) includes:

1. Size of companies, the position of the business in the supply chain, type of industry (Cagliano et al. 2005; Mukhtar et al. 2007);
2. Products supplied which include complexity of product architecture and complexity of supply chain processes (Nepal et al. 2012; Marchewka and Towell 2000) and product demand (local consumption or for export) (Mukhtar et al. 2007);
3. Existing relationship or alliances with supplier/customer (Chae et al. 2005); existence of powerful supply chain player (Liu et al. 2010)
4. Competitive strategy/position of the company (El-Gohary 2012); Existence of an e-business strategy (Phan 2003; Cagliano et al. 2005).
5. Role of the government (AlGhamdi et al. 2011)
6. Technological capabilities, availability of resources and culture of the organizations in the supply chain (Hameed et al. 2012; Liu et al. 2010; Aguila-Obra and Padilla-Melendez 2006)

3.3 Supply Chain Structure Variables

Supply chain structure is a subject not extensively studied but mentioned almost everywhere when researching about supply chains. In Sect. 2.2.2 above a detailed review was carried out to look at the different definitions and connotations adopted by researchers in supply chain management. Lambert et al. (1998) mentioned the importance of comparing supply chain structures. In this chapter, the definition for supply chain structure is expanded from the definition proposed by Mukhtar et al. (2002). This adopted definition of a supply chain structure definition is consistent with the definition of supply chains as comprising of both the physical flow of goods and/or services and also the flow of information. It is made up of four main sets of variables, namely the physical variables, relationship variables, ICT infrastructure variables [cf. the information supply chain sub-structure as described by Lewis and Talalayevsky (2004)] and spatial variables. The components of supply chain structure are depicted in Fig. 2. The details of each set of variables are as follows:

1. The physical variables: The configuration or layout of the supply chain; refers to the number of tiers and location of factories, warehouses, etc.
2. The relationship variables: Buyer supplier relationships between players in the supply chain. It ranges from arm's length to collaboration. It also incorporates power in the supply chain. This variable determines the coordination mechanisms between supply chain members.
3. The ICT infrastructure variables: Refers to the extent and type of ICT infrastructure that is present in the supply chain; it includes (although not limited to) the use/adoption of EDI and/or Intranet technology for information sharing, Internet access and also the availability of software to players in the supply chain; this variable will help describe information flow in the supply chain.
4. Spatial variables: Refers to the geographical location of players in the supply chain; this variable caters for the international or global supply chain and captures information pertaining to issues of logistics and hence the type of carriers used in transporting materials or goods.

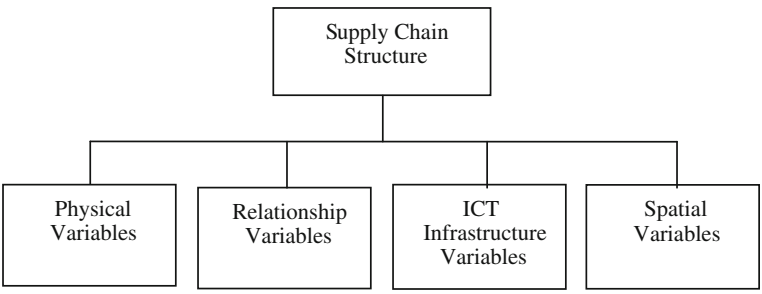

Fig. 2 Supply chain structure

3.4 Supply Chain Performance Variables

The effectiveness of any supply chain management practice is manifested in improved supply chain performance. In general terms, supply chain performance variables are centred on increased customer satisfaction and reduced overall costs. Metrics used range from fill rates and response times to measures such as level of commitment of individual players in the chain and percentage of customisation achieved with respect to customer order (van Hoek 1998). Measures related to supply chain flexibility and agility are also used (Beamon 1999).

3.5 The Contingency Framework for e-Supply Chains Design

Having categorized the various groups of variables, and following the approach of contingency theory, we now propose the following contingency- based framework for e-supply chains as depicted in Fig. 3. Figure 3 illustrates the relationships between the groups of variables. The contingency variables will influence the supply chain structure variables which will in turn influence the e-business practices in a supply chain. This will subsequently affect the supply chain performance. Also, based on the Theory of Technology Adoption as described in Sect. 2.3, the contingency variables mentioned in Sect. 3.2 have been shown to influence the adoption and diffusion of different technologies of which e-business is one of them.

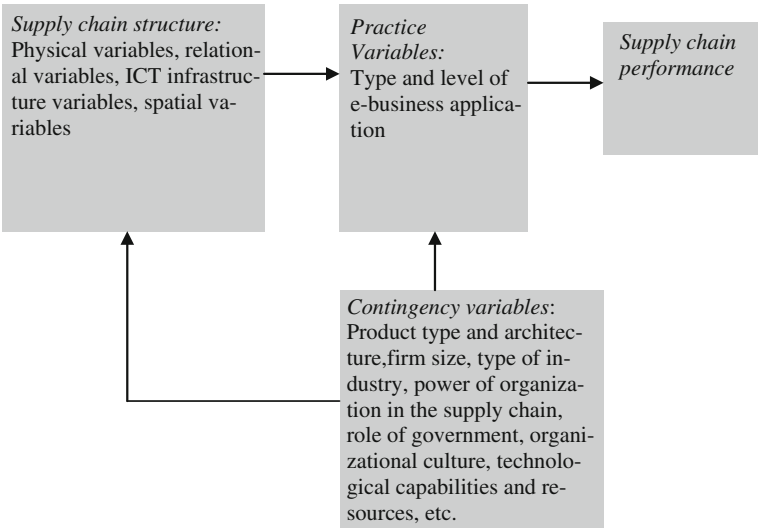

Fig. 3 The contingency framework for e-supply chains design

It is proposed that the contingency framework for e-supply chains design is made up of four components or elements. They are the supply chain structure variables, the practice variables, the contingent or contextual variables and the supply chain performance variables. This contingency framework incorporates two types of relationships between the variables. They are:

- The direct relationship between the practice and supply chain structure variables and supply chain performance. This particular type of relationship is typical of the models whereby the supply chain structure variables influence the practice variables and varying these variables will have the equivalent effect of varying the performance of the supply chain.
- The second type of relationship incorporates the contingent or contextual variables. Here the contingent variables will affect the practice variables and supply chain structure variables. The result of this interaction will ultimately affect the performance of the supply chain.

4 e-Supply Chain Evaluation Framework

In its present form, the contingency framework for e-supply chains analysis is of limited use to practitioners. However, if moulded into an e-supply chain evaluation framework, it will make it easier and more practical for firms to analyse their respective supply chains so that they can decide on how much, in what sequence and in which supply chain process should they invest in e-business.

4.1 e-Supply Chain Scenario

We use the term e-supply chain scenario to describe the e-supply chain instance at hand. It is thus an instance of the supply chain structure and the practice variables. Our definition is consistent with the supply chain scenario definition given by Vlajic et al. (2012), and also with the work of Disney et al. (2004). Disney et al. (2004) investigated (via simulation) five supply chain scenarios four of which are e-supply chain scenarios.

4.2 Evaluation Framework

Via the e-supply chain scenario concept, the proposed framework for e-supply chain design can be moulded into an e-supply chain evaluation framework. This framework, shown in Fig. 4 provides a systematic way by which an e-supply chain

can be analysed. It begins with the identification of the current contingency variables, current supply chain structure and practice variables. This will give the decision maker an understanding of the current variables that are at play and how they affect its current supply chain performance. The next step involves redesigning strategies which will result in several e-supply chain scenarios. These e-supply chain scenarios can then be carefully evaluated by the decision making team based on the required supply chain performance. In essence, the evaluation framework helps in determining the best e-supply chain scenario that will result in the required supply chain performances for given circumstances.

5 A Case Study

In this section, via a case study, the application of the proposed e-supply chain framework is demonstrated. This case study involved the examination of the activities of a vendor (SB Technology) that works closely with an automotive manufacturer. SB Technology is a small and medium enterprise and is one of Malaysia's leading chassis assembly and brake components manufacturer. It produces four types of finished goods, namely the Duplex Module, the Front Axle module, the Front Corner module and the Rear Axle module.

SB Technology is on the brink of developing a web based system to enable online communication and information sharing between them and its own suppliers. Since this is a new innovation by SB Technology, their management team decided to carry out a needs analysis to look at the design and implementation issues before the initiative is carried out. By using the proposed e-supply chain

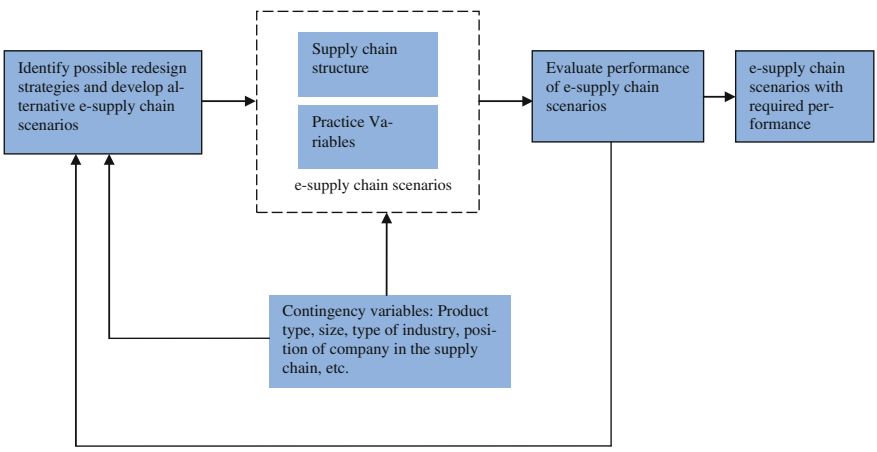

Fig. 4 E-supply chain evaluation framework

framework we are able to systematically analyze the issues that surround SB Technology as follows:

Contingency variables: SB Technology is a small and medium enterprise supplying brake components to a car manufacturer. The level of automation in production is moderate to high. In terms of IT capabilities, SB Technology has a strong IT department whose main role is to support management and financial functions of the company. SB Technology is one of several vendors for a local automotive manufacturer. As such it is required to use a proprietary system for online ordering by the automotive manufacturer. However, communication between SB Technology and its suppliers are carried out via phone, e-mails and facsimile. SB Technology does not have a clear e-business strategy involving the use of any web based systems or B2B applications. Except for the proprietary system imposed by the automotive manufacturer, SB Technology is not involved in any e-business activities like vendor managed inventory (VMI), efficient consumer response (ECR), e-marketplaces, e-procurement etc. SB Technology is currently facing external pressure from its overseas suppliers to adopt an online system for procurement purposes.

Supply chain structure variables: The organization is located some fifteen kilometers from its main customer. It has eighteen suppliers whereby two of them are located overseas. Although they do have a few suppliers that are in close collaboration with them, the relationship between SB Technologies and its suppliers are arms-length in nature. They report that their relationship with their customer are close but they are subjected to the customers' JIT strategy which means that they have to comply to sudden changes in orders which resulted in them 'forcing' their suppliers to do the same. This resulted in a high finished goods inventory and raw materials inventory to cater for last minute changes made by the automotive manufacturer. It can be concluded that there is an element of power present in the relationship between SB Technology and the automotive manufacturer. The ICT infrastructure is present in SB Technology, but under-utilized. Although it is hooked up to the Internet, apart from the website, SB Technology currently does not have its own web-based system to support its functional processes especially with its suppliers.

Practice variables: From several workshops conducted by the research team and the team at SB Technology, two alternatives e-supply chain scenario was developed. The first was to develop a web based e-procurement system that will serve to make the process of parts ordering and delivery from their suppliers more efficient. The second involved the development of a system that integrates the e-procurement function with an existing system that is already in place between SB Technology and their main customer, the automotive manufacturer. These two e-supply chain scenarios were evaluated by the SB Technology team who chose the first alternative. The chosen e-procurement initiative falls into the lower left hand quadrant in the practice variables taxonomy (see Sect. 3.1).

e-supply chain structure performance measures: SB Technology's main customer, the automotive manufacturer, is an important customer whereby the bulk of SB Technology's business is conducted with them. According to the

production team at SB Technology, currently, they have to keep a high level of inventory (both in finished goods and raw material) due to the sudden changes in demand by the automotive manufacturer. The reason for the raw material inventory is to safeguard against the situation whereby SB Technology's suppliers cannot deliver the raw materials in a timely manner. So, two of the key performance measures that SB Technology is interested in are the level of inventory (both finished goods and raw material) and order fill rate at the customer end. The proposed web based e-procurement system that they want should help them to be more efficient and effective in handling its suppliers in order to fulfill its customer's demands.

6 Conclusion

The ubiquity of highly flexible and inexpensive information and communication technologies (ICT) such as the Internet, intranets and extranets, intelligent-agents, global positioning systems, open-EDI standards, electronic markets, e-procurement, and broadband width are creating new possibilities for radical redesign of the supply chain (Kumar and Christiaanse 1999). In their further work, Christiaanse and Kumar (2000), asserted that the advent of ICT has made it possible to redesign the supply chain, by making suitable choices of partners and coordinating mechanism, so as to obtain the 'best' supply chain structure. This chapter has reported on the issues or factors that surround the design of e-supply chains. In order to get at the best structure and hence to attain the required supply chain performance, issues or factors like supply chain configurations, supply chain relationships, supply chain strategies, inventory positions in the supply chain, industry type, size of the organization in the supply chain, types of e-business initiatives etc. must be taken into consideration. Since these issues are varied, it must first be classified. In this chapter we had proposed that the issues can be classified under three main groups. These are the supply chain structure, contingency variables and practice variables.

Next, in an effort to accommodate the dictum of 'different styles for different e-supply chains', we adopt the ideas put forward in Contingency Theory. Combining this with the ideas put forward in the Innovation Diffusion Theory, resulted in the proposed framework for e-supply chain design. The framework is then moulded into a decision making tool via the concept of e-supply chain scenario. Using this approach, several e-supply chain scenarios can be developed. These are then evaluated by the decision maker via the evaluation framework. The frameworks proposed in this chapter provide an avenue by which a better and more thorough understanding of supply chain dynamics would be possible. It forces a balanced and thorough decision making process on the part of the decision maker as described by the case study in Sect. 5. The frameworks also embody the supply chain structure construct which can be used for classifying supply chains. Hence it can provide a theoretical base for which further research could be built upon and

pave the way for new research opportunities with respect to further applications and expansions of the framework.

Besides its theoretical contributions, the proposed frameworks and the findings from the case study offer a number of managerial implications. First, the frameworks are general tools that can be used by managers to understand the exact nature of their organizations' supply chain structure and contingency variables that are present in their organization or environment. By considering a few e-supply chain scenarios and evaluating the performance of each of them will help managers to strategize and prioritize their supply chain and e-business strategies. It will be much easier for them to decide on the subsequent action plan. Secondly, the framework also forces managers to consider several e-supply chain alternatives that require a redesign of their supply chain structure. This presents a valuable insight for the managers regarding the shortcomings of its organization and help in identifying areas for improvement.

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Linking ERP and e-Business to a Framework of an Integrated e-Supply Chain

Mahesh Srinivasan and Asoke Dey

Abstract Recent developments have created an opportunity for organizations to leverage Web-based technologies. Such organizational initiatives need to be supported by sound existing infrastructures based on well-functioning Enterprise Resource Planning (ERP) systems. Also, business processes in multiple organizations across the supply chain need to be integrated to forge tighter links, from raw materials to customers. This chapter examines the evolving relationship between ERP and e-Business. We study how organizations can gain competitive advantage by leveraging the complementarities between these two technologies. We present a framework of e-Supply Chain Management (e-SCM) which facilitates the integration of business processes across the supply chain. We also discuss the recent developments in the area of cloud computing and its impact on the Internet-enabled supply chain environment.

Keywords ERP · e-business · Supply chain management · e-SCM · Cloud computing

1 Introduction

Traditional organizations must embrace the Internet to survive, but, at the same time, pure Internet organizations benefit from the assets and infrastructure of their "bricks-and-mortar" counterparts. The blending of Internet technologies and traditional business processes is impacting all industries and is really the latest phase

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in the ongoing evolution of business. The Internet is driving the current industry goals of a shorter Order-To-Delivery (OTD) cycle, global reach, and personalization. However, without connecting order delivery, manufacturing, financial, human resources, and other back office systems to the Internet, even organizations with long track records of innovation are not likely to succeed. The most successful organizations will be those that leverage their investment in Web-based technologies by implementing e-Business solutions supported by sound existing infrastructures based on well-functioning Enterprise Resource Planning (ERP) systems.

Today, organizations need to forge tighter links up and down the supply chain, from raw materials to customers. Of late, organizations have increasingly turned to the Internet and Web-based technologies to accomplish this. But what they have found is that without ERP software, sharing accurate information with their trading partners is impossible. Web-based technology puts life and breadth into ERP technology that is large and technologically cumbersome and does not easily reveal its value. At the same time, ERP allows e-Business to come into full flow, putting real substance behind that flashy web page. While ERP organizes information within the enterprise, e-Business disseminates information far and wide. In short, ERP and e-Business technologies supercharge each other.

In light of the above, the objectives of this article are to:

- Examine the evolving relationship between e-Business and ERP, and to understand how organizations can move ahead to gain competitive advantage by utilizing these two technologies.
- Study how ERP and e-Business facilitate the integration of processes in multiple organizations across the supply chain.
- To discuss recent developments in the area of e-Supply Chain Management (e-SCM) and cloud computing.

This chapter will be useful to both the research academician and the practicing manager who are interested in understanding the issues, opportunities, and challenges in the ERP and e-Business relationship and how these link to the e-supply chain transformation. More importantly, this chapter provides a comprehensive discussion of the factors involved in the complete e-Business enterprise transformation and some suggestions as to how to navigate the same. The complete e-Business enterprise transformation involves leveraging web-based technologies (including web-based ERP) to manage the major enterprise business functions, and in this case we specifically focus on the supply chain function.

The rest of this chapter is organized as follows: In the next section, we discuss the evolving relationship of e-Business and ERP, including complementarity of the technologies, software provider challenges, and e-Commerce business models. The next section links ERP and e-Business to supply chain integration. We then present an e-SCM framework and discuss the latest developments in the area of cloud computing and its impact on e-SCM operations. We then present out main conclusions with a discussion of managerial implications.

2 The Evolving Relationship of e-Business and ERP

2.1 Literature Review

Since the early 1990s when the term enterprise resource planning (ERP) was coined by the Gartner Group (Jacobs and Weston 2007), ERP systems have been evolving continuously in response to growing business requirements and developments in information technology (Chung et al. 2011). Laframboise and Reyes's (2005) study indicates that ERP systems are not merely a software package but also a way of doing business, since ERP combines different business processes in the organization into one integrated solution. Some of the functionalities that ERP systems offer include a 'full set of supply chain capabilities, including the planning and execution of marketing activities (the demand side), shop floor and inventory management, ordering, billing, and invoicing, with the potential of delegating ordering and receiving to the end-user' (Biehl 2005, p. 29). With the enterprise application integration (EAI) systems, ERP systems can be linked to the rest of the organization and the adopter organization can standardize the process of operations and facilitate the integration of the financial information and customers' orders (Wieder et al. 2006). The majority of the papers related to the ERP literature focus on reasons associated with implementation and on the challenges of the implementation (Staehr et al. 2012; Nazemi et al. 2012). Both practitioners and academic researchers view ERP system as the backbone for serving the aggregated needs of an enterprise (Huang et al. 2009; Moon 2008).

The advent of the Internet and emergence of a more complex and competitive market environment made business organizations respond to customer demands from a value chain perspective, where the role of each member of the chain became significant (Turner and Chung 2005). The ERP systems are now capable of internet integration and, in extension, enterprise application integration through XML and customized interfaces (Baker 2005). The ERP systems integrated with the Internet not only prepare the adopter organization for future IT-dependent initiatives such as tighter supply chain integration, improved e-commerce capabilities, and enhanced organizational learning but also eliminate the operational silos that exist when systems of various functional areas are not well-integrated (Bolt-Lee and Moody 2008). Búrca et al. (2005) examine how small to medium-sized organizations are responding to the challenge of harnessing ERP and Internet technologies to enhance performance and improve competitiveness and aims to identify the barriers preventing organizations from harnessing these technologies. Hopkins (2010) emphasize that the productivity gap between those businesses that effectively utilize the ERP systems and the Internet concurrently and those that do not has widened considerably.

However, creation of an integrated inter-organizational system frequently results in new business processes, management roles, different behaviors, infrastructural changes, and integration of several heterogeneous information system applications spread throughout the organizations (Harris and Ahmed 2011;

McAdam and Galloway 2005, Damanpour 2001). To be successful, organizations have to learn new approaches to plan for the collaborative systems and manage well the cycles of innovation enabled by e-business (Simon and Noblet 2012; Zahra and Gerard 2002). Few studies have explored the dynamics of e-business strategic planning as well as value cocreation between partners within business-to-business contexts to implement new paradigms successfully and to ensure more effective e-business performance as a result (Sarker et al. 2012; Stout and Popri 2011). Stratman (2007) notes that organizations implementing ERP systems with goals targeted outside the enterprise should first develop strong internal business processes and then leverage the operational capabilities of ERP to realize the benefits in the areas of customer service and supply chain efficiencies. Bendoly and Kaefer (2004) illustrate how both the product and the process of ERP system implementation can facilitate and increase the effectiveness of future e-commerce projects, such as B2B e-procurement.

2.2 Key Developments: ERP and e-Business

ERP is the latest in a number of manufacturing and financial information systems that have been devised since the late 1940s to streamline the information flow that parallels the physical flow of goods, from raw materials to finished products (Haddara and Zach 2012). The traditional focus of production-management information systems (MRP, MRPII and ERP) has been on the movement of information within an enterprise (Jacobs and Weston 2007). On the other hand, Web-based technologies facilitate the movement of information between businesses. Such web-based technologies can also facilitate the movement of information in a B2C environment and may also aid in the exchange of information from business to employees and from business to shareholders/partners (Rao 2000).

However, it is necessary to have an internal enterprise transaction engine, independent of the supplier and customer, for any company large enough to be considered an enterprise (Moradi and Bahreininejad 2013). To date, the best of these internal transaction engines are driven by ERP systems. The issue, then, is that e-Business simply does not work without good internal processes and data—which are made possible by ERP systems. Hence, it is necessary for organizations to devote resources to both technologies that facilitate transaction processing and the communication capabilities of e-enabling technologies.

2.2.1 Retrieving and Using Information from the Value-Chain

Today, competitive advantage occurs from the ability of organizations to relay information quickly through the value chain (Barua et al. 2007). What drives the maximum value for the customers is the ability of each organization to retrieve

information from a tightly integrated value chain and to use that information to drive decisions within the organization (Davenport 2000).

Web-based technologies have increased the access to and availability of information. There exists an opportunity to leverage this information across the value chain to create end-to-end linkages and transform the value chain it into an integrated value network. By assembling a network of partners that specialize and excel in the links of the value chain, it is possible for organizations to achieve new levels of quality, flexibility, and cost savings (Alwabel et al. 2006).

2.2.2 The e-Business Potential Aided by ERP

In today's highly competitive environment, there is a need for businesses to work together to create seamless information flows. And this is where web-based technologies prove to be indispensable. The ability of the enterprise to disperse information and communicate with value chain partners is made possible through Web-based technology. The coordination of information with the enterprise's business partners upstream, and its customers downstream in the supply chain and determining how this information is presented is facilitated by ERP technology (Ash and Burn 2003). ERP and e-business are not competitive systems. Their greatest benefits can only be achieved when they are used in agreement, complementing each other. Thus, in today's new business environment, when power has shifted toward consumers who demand intelligent products that deliver new dimensions of value, time, and content, in addition to price and quality, the e-business systems would have only little to present without successful ERP systems (Aldrich 1999).

2.2.3 Complementary Technologies of ERP and e-Business

ERP and Internet technologies have come together in the past decade. ERP is the internal technological nucleus of a single enterprise. Web-based technology extends each enterprise's internal information infrastructure into the external environment. While ERP technology supports current business strategy, e-Business opens the door to new strategic opportunities. ERP systems, when fully installed as integrated suites, can be thought of as central repositories of internal corporate information (Asfoura et al. 2010). ERP software helps organizations to effectively and efficiently manage all their internal information resources to meet overall goals. On the other hand, Web-based technology provides connections via the Internet to a host of external parties. Figure 1 depicts how ERP and Internet/Web-based technologies can come together and complement each other.

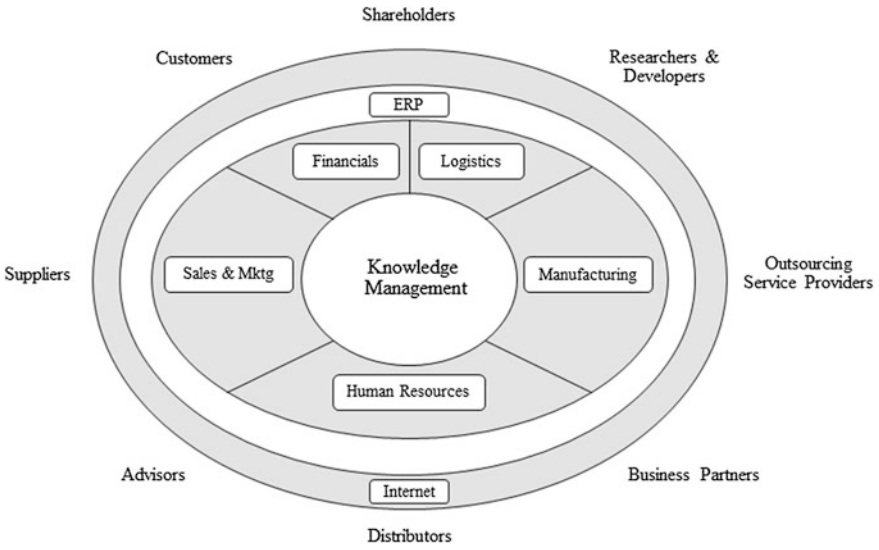

Fig. 1 Complementary technologies of ERP and e-business (Adapted from: Norris et al. 2000)

2.2.4 Software Provider Challenges

ERP software providers face a number of challenges when reinventing themselves for e-Business (Markus et al. 2000a, b). Because ERP applications manage internal business transactions, they generate assumptions about how business processes are managed, the chief among them being that they are controlled by one organization, transactional information should be combined into large totals and that only certain people participate in specific processes (Callaway 2000).

The fundamental design of traditional ERP systems thus inherently conflicts with the outwardly focused, interactive, event-driven model of e-Business. e-Business operates chiefly under the assumptions that control of business processes can be shared or dispersed among many organizations, that people need access to small quantities of some transactional data in real time and that many people participate in a variety of processes (Helo et al. 2008). Hence, it is necessary that ERP software providers overcome this core conflict.

ERP software providers often begin Web enabling their products by making them accessible via a Web browser. Web enabling an application is significantly different from reengineering it to leverage Internet technology. ERP software vendors must go beyond Web enabling their products (Rettig 2007). In order to compete with next-generation Web-based software, ERP providers must add more than a Web browser interface to their packages. They must rebuild the extended products that the Internet makes possible. Among other things, they need to provide quick, simple reconfiguration of business processes, intuitive interfaces that require no training, real-time or near real-time data access, interactive and

collaborative features such as real-time chat and white boarding (which is the ability to electronically sketch out ideas or pictures for real-time interaction), real-time analysis, and open access to any internal or external user.

2.2.5 ERP and e-Commerce

Software providers including ERP vendors are trying to position themselves as e-Business organizations by providing e-commerce software. These software providers and ERP vendors are moving to capitalize on the growing e-commerce frenzy by facilitating their customers' needs to buy and sell online (Damirchi and Rahimi 2011).

E-commerce software and back-end systems, including ERP software, must be integrated so that organizations can manage the fulfillment process seamlessly (Mohapatra 2013). Back-end integration helps organizations track the transactions they conduct on the Web. Organizations can then coordinate the data they collect from online transactions with information they gather from other channels, such as telephone, traditional retail stores, and in-person interactions. Integrating e-commerce sites with back-office systems allows organizations to present an organized, professional image to their trading partners and customers. Tight integration enables the organization to recognize online customers because their histories, including data gathered from other channels, reside in one location—thus enabling the organization to provide superior and improved customer service. Providing this continuity is critical for e-Business success. Without it, customers lose their sense of security and trust when conducting business on a Web site; they cannot be sure the organization is effectively managing its information.

There are a number of ERP systems vendors who are providing e-Commerce applications too (Mohapatra 2013). Most ERP software providers currently focus on six types of e-Commerce applications: B2B selling, B2C storefronts, Commerce engines, Self-service applications, Portals, and Internet based procurement.

ERP applications for B2B selling allow business partners to check order status, pay bills, and initiate orders to replenish inventory. B2C storefront applications enable organizations to create retail-like Web sites with features such as catalogs and shopping carts. Commerce engines (also known as e-commerce servers) separate activity that occurs on a Web site from the back-end systems. This critical process protects internal systems from security breaches and usage spikes that can interrupt important transactions. Self-service applications allow users to access information or transactions that would typically require additional assistance—like obtaining purchase orders, checking inventory levels, checking order status, etc.

Out of these, Portals and Internet based procurement are by far the most important (Remus 2007) and are discussed in the next two sub-sections. Is it predicted that the strategies and products being offered by some of the ERP vendors will change rapidly during the coming few years. Hence buyers need to carefully examine their options before selecting an e-commerce software provider.

Portals

A portal is a Web site that houses a collection of information related to a specific theme or topic and provides visitors with access to related services and information sources. Portals also typically include the ability to conduct transactions (Callaway 2000). Many business portals exist that have been designed and launched for business applications (Smith 2004). ERP software providers are designing their portals primarily for business users. Many organizations have become interested in business-oriented portals because of their potential benefits, which range from simplifying information access to streamlining business processes to sharing information across otherwise functionally and geographically disparate parts of the company (Davydov 2001).

Marketplace Portals: Many ERP providers have created portals where their customers can access extensive lists of goods and service suppliers. The ERP software supplier aggregates—either directly or through partners—a large collection of organizations that sell products and services and enables their customers to buy from them. Large ERP vendors, including SAP and Oracle, are strong proponents of this approach. They believe that their extensive customer bases will attract a significant number of sellers to the market.

The Corporate/Desktop Portal: Portals can also be used to give employees easy access to the typically disparate and disconnected business systems they need to complete their jobs. Via desktop or enterprise portals, which are also referred to as corporate portals, employees can access both internal and external software and systems. Desktop portals are Web-based interfaces that give users access to all the disparate applications through one screen on their PC. Many ERP providers are designing enterprise portals (Collins 2001).

The Vertical Hub: Vertical hub portals target specific groups of organizations in the same industry. Unlike marketplace portals, which offer more generic commerce services, vertical hubs such as PlasticsNet.com and ChemNet provide services, transactions, and other content tailored to the needs of a specific industry. Few ERP providers like SAP currently provide industry-specific portals.

The Business Case for Portals: Enterprise portals facilitate accessing a variety of internal and external applications and information sources (Kakumanu and Mezzacca 2005). In a traditional client–server environment, users must sign onto the system many times to access different applications. An entire application may need to be loaded onto their computers, even though they may use only a small portion of that software. Employees are limited to applications that run in a client–server or windows computing environment, and, in addition to that, they can use only applications and databases that exist within the physical location of their company. Maintaining desktop environments is also expensive and cumbersome because individual applications must be installed on each machine (Ščeulovs and Gaile-Sarkane 2010).

Enterprise portals, on the other hand, allow users to access both internal and external applications and information sources simultaneously via a single, customized, browser-based interface to meet their specific needs (Kastel 2003).

Enterprise portals are easier to maintain because they deliver applications to multiple users via a centrally located server, and users can access only those specific components of particular applications related to their jobs.

Linking Portals to ERP Systems: Organizations require an Enterprise Application Integration (EAI) tool or framework to connect the disparate systems they want to access via their portals. EAI tools are necessary as long as organizations create portals that access both ERP software and external systems, even if they use portals offered by their ERP software provider. Also data integration capabilities will be required to gather data from structured and unstructured data sources.

Internet Procurement

In addition to e-Commerce and portals, ERP software providers have expanded into the areas of Internet-based procurement or e-Procurement (Quayle 2005). Prior researchers have alluded to the benefits of e-Procurement beyond it just being a system that facilitates online purchases. Burt et al. (2003) discuss how such a system can be used to connect the business process between organizations and their key suppliers to enable the management of all interactions between them, starting with RFQs and bids to questions and answers and also access to previous pricing. The use of e-Procurement to facilitate exchange of goods and services across organizations using automated software that use internet technologies is a natural extension to the offerings of ERP vendors. Organizations can conduct e-Procurement through marketplaces discussed above, or directly with its suppliers using software that automates this process using internet technologies (Chang et al. 2003). Related to this is also a system of reverse auctions that have been used effectively for organizations for procurement predominantly of commodities and/or standardized products, parts, materials, and services.

Traditional ERP systems include purchasing functions that allow users to create P.O.s and requisitions, receive invoices, and log spending, for example. Because of their design, however, traditional ERP systems made a single administrator or set of administrators responsible for the entire purchasing function, requiring every employee with purchasing requests to funnel through that channel. Next-generation ERP systems manage purchasing differently (Puschmann and Alt 2005). By using Internet technology and leveraging the component-based architectures of newer software, many ERP package vendors are opening the purchasing function, making it easier for employees to participate in the purchasing process (Bendoly and Schoenherr 2005).

Internet-based procurement systems give the purchaser control over the shopping by providing access to online catalogs, which may be buyer managed, seller managed, or third party managed (Farzin and Nezhad 2010). ERP software providers may use one or a combination of these catalog management tools.

In today's business environment, information is more easily available using Web-based technology to connect both suppliers and customers, and this creates

the opportunity for an enterprise to create new business strategies based on transforming a supply chain into an integrated value network. This concept is discussed in detail in the following section.

3 Using ERP for Effective Supply Chain Management

3.1 Supply Chain and ERP

Supply Chain Management (SCM) is defined as "the systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long term performance of the individual organizations and the supply chain as whole" (Mentzer et al. 2001, p. 18). As such, information sharing is key for effective SCM, and this requires integration of processes residing in multiple organizations across the supply chain. Here is where ERP can play a significant role in facilitating the integration of processes within an organization and systems integration across organizations. ERP are a set of applications that link key business processes like order processing, procurement, inventory management, resource planning and financial accounting within an organization. Added to this mix, ERP can also include supporting processes like human resources management and payroll processing and could also be integrated with other stand-alone systems like Transportation Management (TMS), Warehouse Management (WMS) and Customer Relationship Management (CRM), thus effectively being a broader enterprise-wide system. The integration of ERP and SCM holds much potential. Tarn et al. (2002) envision such an integration to create "a new spectrum in the information industry." Introducing SCM into the ERP equation can facilitate collaboration among the key stakeholders across the value chain.

The extant literature discusses how such an application of ERP systems can have a significant positive effect on SCM. Using empirical data from Taiwanese information technology firms, Su and Yang (2010) establish a strong relationship between the benefits of implementing ERP systems and the firm's competences in SCM. The inter-relationship is evidenced through operational benefits, business process and management benefits, and strategic IT planning benefits of ERP, resulting in operational process integration, customer relationship integration, and planning and control process integration. Based on a Delphi study conducted with 23 Dutch supply chain executives of European multi-nationals, Akkermans et al. (2003) found that the expert panel in the study envisioned a very modest role for ERP in improving SCM effectiveness. Instead, the positive impact that ERP could have was seen to be in the area of increased customization of products and services, the need for standardized processes and information, the need for worldwide IT systems, and to achieve greater transparency of the marketplace. Shahat and Udin (2012), through the results of a questionnaire survey posted to the Malaysian

manufacturing organizations, also found a positive and significant relationship between ERP system and SCM performance. However, the author's results establish that the workflow management functionality of ERP systems does not have a significant relationship with SCM performance. On the other hand, integration, material management, production planning, and controlling functionalities of ERP systems in particular have a significant positive impact on SCM performance (Ho 2007).

3.2 ERP and Supply Chain Management Integration

As discussed above, ERP systems, being an integrated set of applications which plays the role of a broader enterprise business system with its focus on automating the business processes, can be very effective towards achieving inter-organizational integration across the supply chain. Fawcett and Magnan (2002) discuss four types of integration. These include: internal, cross-functional process integration; backward integration with valued first-tier suppliers, leading to integration with second-tier, forward integration with valued first-tier customers, and complete forward and backward integration. Bagchi and Skjoett-Larsen (2002) suggest two kinds of integration, namely information integration and organizational integration. Lee and Whang (2001) study the impact the Internet can have on supply chain integration based on four key dimensions:

- information integration, which includes real-time information sharing and accessibility leading to reduced bull-whip effect and enabling a faster response to marketplace changes;
- synchronized planning with its main focus on collaborative planning, forecasting, and replenishment (CPFR) which again could result in a reduced bull-whip effect along with efficiency gains and improved service to customers;
- workflow coordination through integrated automated business processes to coordinate production and planning operations, procurement, order processing, and design activities;
- the creation of new business models leading to better asset utilizations, and aiding in new product development and penetration of new markets.

Supported by the above discussion, we argue that within the context of SCM, information integration is a precursor for true and effective organizational integration.

The successful implementation and subsequent use of ERP system can play a significant role in enhancing the performance of supply chains in a number of ways. This may be achieved through the integration of internal business processes, enhancement of information flow among different departments inside the company, and improvement of the company's relationships and collaboration with outsourcing suppliers, customers, and supply chain partners (Shahat and Udin 2012).

In the present day, businesses are dealing with an increased volume of information which they need to effectively leverage to deal with the complexities of a dynamic business environment. This calls for the adoption of innovative and flexible enterprise wide business systems to improve efficiency and responsiveness. ERP systems need to be adaptable in order to integrate the information and knowledge within an organization and across its supply chain. For example, businesses need to be able to respond in almost real-time to changes in supply conditions to market intelligence (demand and price information). To facilitate inter-organizational information sharing and collaboration, ERP systems can "help to establish a chain of suppliers/producers, and customers; in order to coordinate and facilitate the relations between the suppliers and customers through the information sharing program along this chain" (Toloie et al. 2011).

The integration of ERP with e-Business is not without its own challenges. ERP systems have been discussed as a key challenge to supply chain integration in the literature (Forslund and Jonsson 2010). Hvolby and Trienekens (2010) note that the main challenge with respect to business systems integration lies with the framework required to better support business system application development. Using an example of the customer requirement fulfillment process, which involves product development and order fulfillment activities that cross the borders of the company's departments and extend those activities to various other organizations in the supply chain. Hvolby and Trienekens (2010) note that such business integration across systems and borders are still not matured and to a large extent are still facilitated by human interaction. Based on the results of the Delphi method, the expert panel in the Akkermans et al. (2003) study foresaw a clear risk of ERP actually limiting progress in SCM. The key limitations of current ERP systems in providing effective SCM support were found to be mainly due to the lack of extended enterprise functionality; the inflexibility of present day ERP systems to adapt to the every changing needs required from the supply chain on account of a dynamic marketplace, their lack of functionality due to the primary focus of ERP systems on pre-dominantly managing transactions, and their closed and non-modular system architecture.

In a supply chain, the focus is predominantly on inter-organizational linkages and integration, thus making such legacy ERP systems inadequate for the challenges of the new economy (Ghani et al. 2009). Awad and Nassar (2010) summarize the challenges organizations face with respect to supply chain integration from three perspectives: technical, relational, and managerial. ERP systems achieve data and application integration well due to an integration of the business functions through a common database. The challenge with ERP systems lies in the integration of business processes, because ERP systems fail to bridge the gap between the application and process layers in a flexible fashion. Thus one of the key factors in ERP systems achieving true integration is that the applications must integrate with the business processes (Bose et al. 2008). Such an integration will facilitate the coordination of processes between all the firms in the supply chain. Business process integration also faces resistance due to "compatibility challenges in a technical, operational, strategic, and political/legal environment" (Awad and

Nassar 2010). For example, organizations in a supply chain may adopt many diverse formats like databases, EDI systems, text files, and, lately, XML-based applications in order to store and exchange data. Ultimately, the data must be of high quality, and efforts need to be made to ensure that the data is accurate, relevant, and of compatible standards. As such, traditional ERP technologies are complex and very expensive because they have to integrate heterogeneous information systems.

In this context, we propose an approach based on e-Supply Chain Management (e-SCM). e-SCM focuses on the management of information flows and represents a philosophy of managing technology and processes in such a way that the enterprise optimizes the delivery of goods, services, and information from the supplier to the customer. As organizations enter a new era of global competitiveness, e-SCM becomes a tremendous catalyst for achieving and maintaining a competitive advantage by enhancing and fostering operational agility and lower cost structure, product/service differentiation, and increased market share and profitability (Folnas et al. 2004). However, in order for enterprises to leverage the benefits of e-SCM capabilities, it is necessary to ensure that their own ERP systems are implemented correctly beforehand (Norris et al. 2000). e-SCM also is mentioned as creating a level playing field for small organizations relative to large organizations, thus allowing enterprises to access suppliers and customers around the world without regard to size (Búrca et al. 2005). In the quest to achieve long-term flexibility and adaptability, e-SCM provides organizations with significantly increased strategic options Sarkis and Sundarraj (2000). e-SCM is perceived as the vehicle to meet the customer demands of faster turnaround and greater customization (Van Hoek 2001) and at the same time improve their relationships with customers to create customer loyalty (Búrca et al. 2005). We discuss this key role of e-SCM in facilitating a truly integrated end-to-end supply chain further below.

3.3 e-Supply Chain

Gimenez and Lourenco (2008) define e-SCM as "the impact that the internet has on the integration of key business processes from end-user through original suppliers that provides products, services and information that add value for customers and other stakeholders" (p. 311). We cite this definition primarily because it focusses on the idea of process integration. e-SCM is about cultural change and changes in management policies, performance metrics, business processes, and organizational structures across the supply chain (Norris et al. 2000).

Information visibility across the supply chain can become a substitute for inventory; therefore, information must be managed as inventory is managed—with strict policies, discipline, and daily monitoring. Integrating the supply chain more tightly, both within a company and across an extended enterprise made up of suppliers, trading partners, logistics providers, and the distribution channel, is the

vision implied in the snapshot of the e-Business panorama of value chain integration (Downing 2010).

Visibility, access, and timeliness lie at the core of value chain integration. Essentially, value chain integration helps avoid mismatch within the supply and demand functions by facilitating real-time synchronization of supply and demand. The enabler to supporting an organization in its efforts to become part of an extended enterprise, e-SCM requires organizations to develop collaborative business systems and processes that can span across multiple enterprise boundaries.

The e-supply chain consists of six components:

- Supply chain Replenishment—which encompasses the integrated production and distribution processes that utilize real-time demand and strategic partner alignment to improve customer responsiveness;
- Collaborative Planning—which requires buyers and sellers to develop a single shared forecast of demand and plan of supply to support this demand, and to update it regularly;
- Collaborative Product Development—which involves the use of product-design and product-development techniques across multiple organizations, using e-Business;
- e-Logistics—which is the use of Web-based technologies to support the warehouse and transportation management processes;
- Internet Procurement;
- Web Portals—the last two of which have been discussed in detail in earlier sections of this chapter.

Of course, to enable this requires common standards across the supply chain like those for document transmission and access to data sources through standard database interfaces, use of XML which supports standard data formats, applications to link e-commerce data into back-end ERP type, order fulfillment systems through appropriate web interfaces, and business intelligence tools which help make data actionable by extracting and validating data from a diverse array of systems (Delia and Voicilă 2011). Hence, a completely integrated e-SCM model requires that traditional ERP systems be effectively coupled and linked with e-business applications through EAI (Enterprise Application Integration) and adapt communication standards like EDI and XML. This also requires the use of portals that serve as front-end interfaces to enterprise information systems in order to query and extract data from ERP systems for sharing with customers, suppliers, and service providers across the supply chain.

So the next question is: How exactly would an e-Supply Chain work? A model of such a concept of e-Supply Chain is given in Fig. 2.

Here is how the e-Supply Chain would ideally operate. Consider that company B is a major retailer having a retail chain network across the country and company A is one of its major suppliers. When a consumer purchase occurs at company B, the data is fed to the retail chain's ERP system. The retail chain (company B) then moves the updated demand data to the Extranet. At this time the critical data is

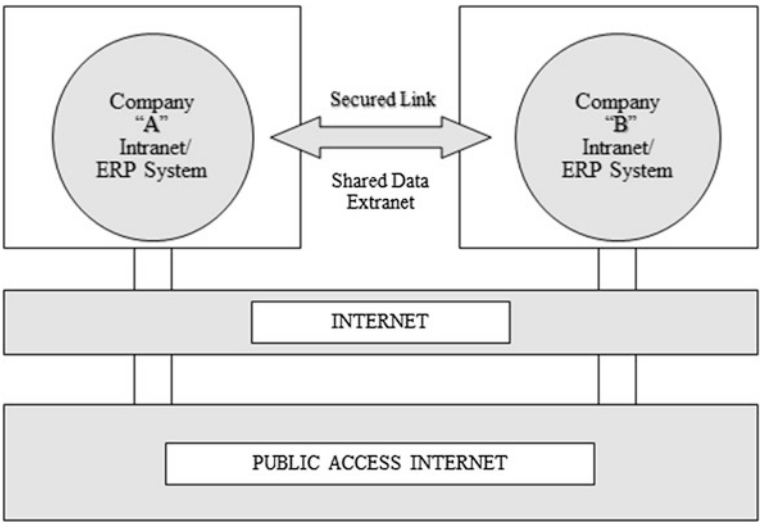

Fig. 2 Model of an e-supply chain

automatically fed into the company A's ERP system. This system runs and makes the appropriate quantity and schedule adjustments. The key output is copied to the extranet set up between company A and its suppliers. This data might include updated inventory snapshots as well as updated forecasted demand and orders for materials. Based on the data company A's suppliers see on the extranet, they automatically replenish company A's inventory and adjust their own ERP gross requirements to meet demands. The end result is the real-time update of demands from the consumer to the raw material supplier. Thus the e-Supply Chain creates a seamless environment that stretches from customers right through to suppliers. Hence, with the e-Supply Chain, organizations will be able to manage the supply chain to achieve the right balance of customer responsiveness and low inventory levels with an aggressive cycle time. Thus e-SCM enables the integration and synchronization of information and processes across the supply chain. It facilitates real-time information sharing to enable collaborative planning, forecasting, and replenishment, as well as the ability for supply chain event management, which is responding quickly to critical events and exceptions related to supply, customers, and markets in the supply chain.

In the last few years, there has been a subtle but important change in terms of how organizations rank their supply chain priorities. Results from a recent survey conducted by the Gartner group and Supply Digest show that organizations' topmost supply chain priorities have changed from 'improve productivity' and 'reduce costs' in 2010 and 2011 to 'improve customer service', 'use supply chain to drive the top line' and 'increase supply chain innovation' (Gilmore 2012). This change will likely propel excellent growth opportunity for new web-based technologies like cloud computing. Application solutions in warehouse management,

transportation management, or inventory management are available though cloud-based affiliation that can provide the necessary supply chain innovation that organizations are looking for. The following section describes cloud computing and its impact on the e-SCM environment.

3.4 Cloud Computing and Its Impact on e-SCM

The National Institute of Standards and Technology defines cloud computing as "a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction" (NIST 2013). The vital features of a cloud include promoting availability; providing on-demand self-service; access to a broad network via mobile phones, laptops, tablets, and more; a rapid elasticity; and a transparent usage for both provider and consumer of service. The cloud can be classified into three different service models: Cloud Software as a Service (SaaS), as in consumers can use providers' applications through various devices; cloud Platform as a Service (PaaS); or cloud Infrastructure as a Service (IaaS) (NIST 2013).

Broken down into more basic terms for the non-IT expert, the cloud is a shared information base, a source of services, and, most importantly, a new delivery model of this information and these services. Not only is it an inexhaustible supply of hardware, software, and data support, but the stress and hassle that inevitably comes along with most information systems is left to one's particular provider. These providers handle crashes, viruses, upgrades, and most everything else that may need management. It is gradually going to change the way people work and organizations operate, and allow them to collaborate in new ways. The type of cloud computing that we focus on here is Enterprise Cloud Computing (Hill et al. 2013). Enterprise Cloud Computing focuses on improved collaboration among business partners and customers in order to gain competitive advantage that can be achieved through cost savings by leveraging one of the three cloud models discussed above. More importantly, this can provide businesses with the speed and agility to respond to the needs of today's dynamic markets and customers (Brynjolfsson et al. 2010).

In large organizations, supply chains are tied together with expensive and complex information systems, which are difficult to design and maintain, and which can't keep up with the growth forces of markets made possible by the Internet, and now the cloud. Organizations don't want more and more software applications; they want business processes that produce the value that is demanded by their customers, and effective approaches such as these are no longer "owned" by just one corporation (Ford 2010). Business activities and processes can be united in the cloud with up-to-the-minute collaborations between an organization's customers, suppliers, and trading partners. Centering these activities in the cloud

gives each member access to the capabilities necessary for corporations to innovate and deliver value to their customers (Rozemeijer et al. 2012).

Components of supply chain processes, for instance forecasting, planning, purchasing, inventory management, order management, and fulfillment, are highly interdependent, not merely sequential as traditional software is designed to support. Present day traditional ERP systems lack the flexibility and versatility to keep up with the constantly changing shape of the supply chain network and volume of activities. More reliable forecasts and rapid implementations are needed, and manufacturers are looking for a means to do this which takes advantage of the benefits of supply chain applications without implementing conventional on-site technologies (Steinfield et al. 2011). The cloud allows manufacturers to quickly generate these forecasts and optimize production plans that are based on a global view of customer demand. The gap is bridged between front- and back-end planning, and manufacturers are able to efficiently satisfy customer demand, while increasing net profitability through managing better inventory holdings (Cegieski et al. 2012). Moreover, cloud computing facilitates the push on achieving quick positive return on supply chain related investments and assets by avoiding the large upfront hardware and infrastructure costs associated with traditional ERP systems (Gong 2011). However, it is unlikely cloud computing would initially be a complete replacement for on-site ERP systems. Few studies note that issues such as the lack of connectivity and adequate bandwidth in many parts of the world and dependability of local power supplies can pose challenges in full-scale implementation of cloud-based solutions (Kshteri 2011; Greengard 2010). It is more probable for organizations to start using a hybrid of on-premise, "public" cloud and "private" cloud services. This approach often can make it easier to transfer services over to a third-party provider at a later date. For many organizations, such a strategy is also less threatening than a full-scale move to the public cloud and is ideal for cost- and risk-averse supply networks.

The immediate impact of cloud computing on ERP systems is that is enables ERP systems to leverage mobile technologies, thus allowing ERP system users access round the clock and from any place (Miranda 2013). This will enable users to perform real-time queries on the ERP system. This may prove immensely useful, for example, to the sales professional, so that he or she obtains information about customer orders and complete customer accounts in real-time (Arnesen 2013). The benefit of cloud computing on supply chains can be even more profound. Cloud computing enables the supply chain network to work on a single platform, thus eliminating some of the technical integration issues discussed before (Ryu et al. 2011). All the members of the supply chain can benefit from a common view of the processes and activities in the supply chain. It enables traditional supply chain activities like demand planning and collaborative planning, forecasting, and replenishment to accessed in the cloud. Since data is stored and accessed via the cloud, it implies that supply chain members will have access to real-time data. Thus, cloud technologies have the potential to be a next-generation decision support tool enabling supply chain members to have access to business

intelligence tools which helps make data actionable by extracting and validating data from a single common cloud platform (Riedl et al. 2010).

We envision an e-SCM model like the one we describe earlier to include standardized cloud computing facilities. This does not mean that the need for ERP systems will be eliminated. The e-SCM model may be required to be redesigned and adapted so that ERP systems themselves may be hosted on the cloud. Thus a cloud based e-SCM system can benefit in two ways: internal to an enterprise and across its supply chain. First, it can optimize an enterprise's value chain by integrating all the key business activities and processes in the Order-to-Cash cycle. Also, data is made available across different business functions through a common database. This provides critical visibility required for effective decision making and reduces redundant or duplicate information systems. Second, such a system will facilitate the exchange of real-time data among the various components of the e-SCM model, thus facilitating collaboration and the ability to react to changes in the marketplace in a dynamic way (Cheng et al. 2011).

The benefits of positioning a supply network in the cloud are quite evident. Potential results of correctly implemented solutions include improved sales, reduced cost of goods sold, a decrease in inventory, and cross-community visibility that has been unavailable until now (Kumthekar and Aserkar 2012). Key to effectively putting this technology into action at any enterprise, large or small, is ensuring the network of partners in the cloud will feel that they are in an environment of trust: trust regarding what information is shared and to what extent, and that the information will not be leaked to competitors or used against any members of the chain. Needless to say, agreements should set up guaranteeing security and encouraging all members to work together wholly (Updergrove 2011). Organizations that promote a culture of trust will likely be the most successful at maintaining the transparency and flexibility that makes cloud computing in supply chain management so valuable (Demirkan et al. 2010).

4 Conclusion

Today organizations are facing increased pressures to meet the dynamic needs of the markets and customers. Such pressures from the environment require the organizations to find innovative approaches to be efficient and responsive to both customers and changing market needs. Organizations have traditionally relied on Enterprise Resource Planning (ERP) systems to manage key aspects of the Order-to-Cash cycle. ERP systems combine different business processes in the organization into one integrated solution. Also the Internet has helped proliferate new e-Commerce models which include Portals and e-Procurement platforms. Successful organizations have effectively adopted and leveraged these new e-Business solutions. We examine the evolving relationship between e-Business and ERP, and discuss how organizations can move ahead to gain competitive advantage by utilizing these two complementary technologies. ERP systems and e-Business

technologies are not competitive systems and their greatest benefits can only achieved when they are used in agreement, complementing each other.

Further, ERP systems can play a significant role in facilitating systems integration across organizations. Developments related to increase in outsourcing in line with a refocus on the organization's core competencies and the breaking down of global trade barriers have meant that organizations are increasingly reliant on their geographically dispersed supply chains to stay competitive. This requires ERP systems to be linked to other stand-alone systems like Warehouse Management Systems (WMS), Transportation Management Systems (TMS), and Customer Relationship Management (CRM) systems. Many of these disparate systems are often residing with the organization's supply chain partners, like suppliers, service providers, distributors, etc. The ability to share information with key supply chain stakeholders and use that information to drive decisions aided by business intelligence becomes a necessity for a successful supply chain. Doing so effectively have been shown to increase supply chain performance and competence. We strongly argue the pivotal role of information integration across the supply chain.

We study the challenges in the integration of ERP and e-Business to facilitate information integration amongst the supply chain trading partners. While e-Business requires tight collaboration among trading partners, the traditional ERP systems are completely designed to facilitate such collaboration. In this context, we present an e-Supply Chain Management (e-SCM) framework which focuses on the synergies between ERP and e-Business and leverages the web-based technologies to achieve supply chain integration. The framework involves the integration of vendor-supplied ERP, decision support tools, middleware, and Web based trading engines like Portals and e-Procurement platforms to achieve the promised benefits of e-Business. e-SCM enables the integration and synchronization of the information throughout the processes across the supply chain. However, the bottom line is that organizations best positioned to succeed at e-Business are those that have solid business infrastructures and well-functioning business processes utilizing ERP-based systems with enhanced operational capabilities.

Finally, we discuss how the latest developments in cloud computing can impact the e-SCM model. The immediate impact of cloud computing on ERP systems is that is enables ERP systems to leverage mobile technologies. Also, since data is stored and accessed via the cloud, it helps make data actionable by extracting and validating data from a single common cloud platform. Business activities and processes can be united in the cloud with real-time virtual collaborations between an organization's customers, suppliers, and trading partners. Thus, cloud-based services have the potential to develop into decision support and business intelligence tools for supply chain members that can also reduce supply chain costs with fast and effective information sharing. We discuss some managerial and practical implications of our study in the next section.

5 Implications

5.1 Managerial Implications

Managers should be able to utilize the outcomes of the different studies referred in our chapter. These include recognizing that there is a strong relationship between the benefits of implementing ERP systems and the organization's competences in SCM, as evidenced through reengineering of business processes, operational benefits, and financial benefits. Further, ERP systems paired correctly with e-Business solutions could have a significant impact on facilitating the end-to-end integration across the supply chain. This is mainly through information integration, which includes real-time information sharing and accessibility, enabling a faster response to marketplace changes, synchronized planning with its main focus on collaborative planning forecasting and replenishment (CPFR), and workflow coordination through integrated automated business processes.

However, managers must also recognize that integration of ERP with e-Business is not without its own challenges. Managers must pay particular attention to the fact that business integration across systems and borders are still not matured and to a large extent are still facilitated by human interaction. Also, key limitations of current ERP systems in providing effective SCM support are mainly on account of the lack of extended enterprise functionality; the inflexibility of present day ERP systems to adapt to the every changing needs required from the supply chain on account of a dynamic marketplace, their lack of functionality due to the primary focus of ERP systems on per-dominantly managing transactions, and their closed and non-modular system architecture.

Managers should also not miss the bus with respect to business-oriented Portals especially because of their potential benefits, which range from simplifying information access to streamlining business processes to sharing information across otherwise functionally and geographically disparate parts of the company. On the same lines, e-Procurement holds much potential beyond it just being a system that facilitates online purchases, in that such a system can be used to connect the business process between organizations and their key suppliers to enable the management of all interactions between them.

Our research on the cloud ERP solutions show that for organizations that have standard functional requirements with a strong desire to outsource IT infrastructure will embrace the cloud-based software first. On the other hand, for complex and highly customized supply chains, where strong control over the IT functionality is deemed important, managers should not totally discard the on-premises ERP solutions. A hybrid approach is less threatening than a full-scale move to the public cloud and often can make transfer services over to a third-party provider easier. A strategy to maintain and manage both options–Cloud-based ERP and in-house ERP systems–is what we recommend.

5.2 Practical Implications

Our practical implications mainly revolve around how ERP systems need to develop and adapt, so that they remain relevant for use with the latest e-Business solutions and also facilitate integration across the supply chain. These needs include the following:

- ERP systems must have redesigned interfaces, processes, and underlying architecture that operates in a multi-tier environment tailored for a variety of users who require flexibility.
- ERP systems must incorporate the latest web-based technologies and web-based features.
- ERP systems need to have their transactional systems be more compatible with front-office applications.
- ERP systems providers must reconcile and integrate their disparate data models and execution engines, which may require separating the ERP ex-tensions from the central ERP database.

ERP software providers that develop the most open systems, which make it easier for organizations to work together, will be the winners.

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Part III.2
Key Business Processes, Areas and Activities: Marketing

Strategic Marketing and e-Business

John M. Rudd, Neil Shepherd and Nick Lee

Abstract The dramatic growth in e-business is manifest in phenomena such as the surge in internet retailing, the boom in social media based marketing communications, and the centrality of e-commerce to many organizations' core strategies. Despite this the precise implications of e-business for marketing strategy remain little-understood. In order to guide theory development and practice in the marketing strategy domain, it is of fundamental importance to take stock of the impact that e-business has had upon strategic marketing. Therefore, this chapter develops a conceptual framework in order to explicate the implications of e-business for strategic marketing theory and practice. We find that the impact of e-business on strategic marketing is far-reaching; influencing not only isolated departments, but the organization as a whole. Finally, we conclude that whilst organizations should be alert to the dynamic opportunities and threats posed by e-business, the guiding principle of value creation should not be forgotten.

Keywords Strategic marketing · e-business · e-commerce · Strategy formulation

1 Introduction

Over the past decade organizations have faced unprecedented levels of turbulence and uncertainty in competitive markets. Contemporary organizations are required to constantly examine, and re-examine, current and future products and services, and to form long-term plans in order to marshal resources accordingly. Much of the turbulence and uncertainty has been caused by large-scale discontinuities in markets, driven by web-based innovation. While this has been particularly

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prominent in business-to-consumer, service-led environments, it would be fair to say that no organization has been untouched by this phenomenon. Given discussions in the management literature regarding the reduced impact of strategic marketing research and also, wider discussions regarding the influence of marketing and marketers within organizations; it is of vital importance to the study and practice of strategic marketing and that that the precise impact of "e-business" on the strategic marketing process is understood.

It's undeniable that the impact of e-Business on strategic marketing theory has been substantial. However, in order to provide a first step at understanding how substantial this impact has been, on the domain of strategic marketing three criteria can be applied (Day and Montgomery 1999): (a) e-commerce poses enduring questions to the strategic marketing domain of study, (b) e-commerce can be distinguished from related fields and contributing disciplines and, (c) e-business is amenable to accommodating new insights and approaches. E-Business is therefore of fundamental significance to the domain of strategic marketing and requires further discussion, supported by empirical research, and conceptual theory development. Such a co-ordinated research effort will provide helpful and much needed insight to top management teams and marketing practitioners.

This chapter presents a discussion of the current nature of strategic marketing as a domain of study and, discusses implications for theory development in this important area, in light of the explosive and continuing growth of e-business across global competitive markets.

2 Strategic Marketing

Some debate exists in the marketing literature regarding precise definitions, and thus the delineation of, the terms *strategic marketing* and *marketing strategy*. While a full debate is somewhat outside the scope of this chapter, a brief overview is now presented in order to provide a clear framework for further discussion.[1]

The terms strategic marketing and marketing strategy have been used interchangeably in the management literature (Varadarajan 2010). Authors have attributed significant problems to this, going as far as describing a domain-level identity crisis and a reduction in the impact of strategic marketing research (Reibstein et al. 2009). That said, while confusion in terminology may be, in part, responsible for a diminution of strategic marketing research, it is hard to imagine that this is the only issue in play. However, for the domain of strategic marketing and, more selfishly, for the purposes of this chapter, confusing terms are of central concern. Moreover as social scientists seeking meaning, the importance of first defining the terms we are about to discuss is, to say the least, useful.

[1] For a broad ranging, informative and well structured discussion of these issues see Varadarajan (2010).

Caution in defining a domain of study must be exercised as any attempts at precise definition must be flexible enough to accommodate new and interesting issues at the periphery, but at the same time must be useful as a point of reference to those seeking to develop theory around core concepts and ideas. Additionally, from a more applied perspective, the manifold forces acting on organizations continually raise new and exciting challenges for marketing practice, and also of course for theorists seeking to build theory of a strategic nature. Hence, any precise definitions are transient and in need of frequent revisions, and we would not claim our working definitions here to be definitive in any way.

In order to expedite the discussion presented in this chapter, some guidance on the main topics of interest in the domain of strategic marketing is available in the management literature and here, the term strategic marketing is used to refer to the *field of study*, and marketing strategy to the *organizational strategy construct*. As such strategic marketing deals with wider issues than a restricted focus on marketing strategy would allow. More specifically, strategic marketing examines marketing-related issues of organizational, inter-organizational and environmental phenomena, whereas marketing strategy is confined to organizational decisions regarding product portfolio, branding and brand management, competitive positioning and marketing mix (Morgan 2012; Varadarajan 2010; Varadarajan and Yadav 2002).

Nine specific topics that define strategic marketing as a domain of study have been cited in the literature; these are presented in Table 1.

As the main objective of this chapter is to examine the impact of e-Business on strategic marketing, the topics in Table 1 present a useful framework against which to review the impact of the growth of e-business on strategic marketing.[2]

However prior to an examination of these specific topics, a brief discussion on e-Business is presented in order to define the topic, delineate it from related subjects and to outline some of the key implications of e-business for strategic marketing.

3 e-Business

For the purposes of this chapter, e-Business is defined as "*The practice of performing and coordinating critical business processes such as designing products, obtaining supplies, manufacturing, selling, fulfilling orders, and providing services through the extensive use of computer and communication technologies and computerised data*" (Alter et al. 2001). This is a useful definition, and relates strongly to the strategic marketing domain topics outlined in Table 1 above, and it is also broad enough to allow a wider discussion at the peripheries. For example, the phrase "*providing services*" in the definition above, could be associated with

[2] Discussions on issues vi to ix are included in the other sections to reduce overlap.

Table 1 Topics defining the domain of strategic marketing as a field of study (adapted from Varadarajan 2010: p 124)

Strategic marketing topics	To include:
Marketing strategy	
(1) Scope	•Organizational scope
	•Market scope
(2) Process	•Strategy formulation process
	•Strategy content
	•Strategy implementation
(3) Behaviors	•Competitive behavior
	•Cooperative behavior
	•Collusive behavior
(4) Context	•Market orientation
	•Organizational culture and climate
	•Organizational learning
	•Market and marketing Knowledge management
	•Web 1.0, 2.0 … technologies
	•Sustainable business practices
	•Corporate social responsibility
	•Social media
(5) Relationships	•Antecedents
	•Consequences
	•Moderators
	•Mediators
Inter-organizational	
(6) Vertical Interfaces	•Marketing Strategy/cooperation and coordination with suppliers
(7) Horizontal Interfaces	•Strategic marketing alliances
	•Multi-point (multi-market and multi-product) competition
Intra-Organizational	
(8) Vertical Interfaces	•Distinctive and overlapping domains of marketing strategy, business strategy, and corporate strategy
	•Influence of marketing strategy on business and corporate strategy
	•Locus of decision making for marketing strategy
(9) Horizontal Interfaces	•Marketing strategy/R&D strategy
	•Marketing strategy/manufacturing strategy

any number of strategic marketing issues highlighted in Table 1, such as, implementation, organizational culture and climate, market orientation, or sustainable business practices. The differential between internal and external e-Business issues is thereby made. This presents significant scope for discussion. However, attempts will be made to provide strict definitions of terms, where available, and to focus discussion around core issues of interest to as many readers as possible.

The clarity of the notion of e-Business suffers from similar issues of definition as those discussed in relation to marketing strategy. The all encompassing

presence and growth of the Internet in all dimensions of life, has seemingly caused a significant explosion in web-based commercial applications. For example, the number of internet users as a percentage of the world population has increased from 0.4 % in 1995 to 33 % in 2012,[3] and on-line retail sales now account for nearly 11 % of all retail sales in the UK.[4]

In order to understand and explain this phenomenon, academic study in this area has undergone a similar and no less explosive level of growth. However, many of the terms cited in this flurry of theory development appear to be used interchangeably. The most commonly example of this being e-Business and e-Commerce; with both confusingly seeming to refer to commercial activities that take place through a web-based environment. Additionally, e-Marketing lacks a precise definition, and in the literature the terms has been used to describe both tactical activities, such as social media and marketing communications campaigns, as well as strategic issues such as data gathering to inform core strategy development and top management team decision making. As such, issues of scope are relevant to any discussion of e-Business. However for reasons of brevity, here we contain discussion to issues specifically relevant to strategic marketing.

A further, and possibly more complex, theoretical issue to be considered is that of the temporal impact of "e-Business". More specifically, the question arises as to whether e-Business is a driver of change in itself, or a largely descriptive outcome of other forces. To explain further, if we choose to examine an organisation at random, and assess e-Business therein, we would be describing what already exists. What is observed will have been shaped by some combination of internal issues (e.g. resources available, culture, or top management team preferences) and external issues (e.g. competitive pressures). Inherently, this is an endogenous outcome. However, within a wider competitive context, the e-Business practices of our chosen organization will impact directly on competitors by making them more or less attractive to customers in comparison. As such this is an exogenous driver of change and not an outcome. Thus, trying to define a specific temporal role for e-Business in strategic marketing is somewhat problematic and, within an exploratory discussion of these issues, possibly unhelpful. Hence, in the discussion that follows, e-Business is discussed as a driver and also an outcome of strategic marketing change.

The following section presents a discussion of the topics highlighted in Table 1. These issues are discussed in turn with reference to the academic and practical impact of e-Business. The intention therefore is to demonstrate the significant changes brought about by e-business on strategic marketing from academic and practical perspectives.

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[3] Source: Internet World Stats 2012. History and Growth of the Internet from 1995 till Today. Available at: <http://www.internetworldstats.com/emarketing.htm. > [Accessed 3 July 2012].

[4] Source: Office for National Statistics 2012. Retail Sales—2012. [online]. Available at: <http://www.ons.gov.uk/ons/rel/rsi/retail-sales/february-2012/stb-february-2012.html> [Accessed 3 July 2012].

4 Strategic Marketing and e-Business

4.1 Marketing Strategy Scope

While no precise definition is available, *organizational scope* is viewed in the literature as an objective assessment of organizational coverage, or in other words the numbers and categories of businesses within a specific portfolio. Additionally, issues of products, services and brands are also discussed with regard to scope. Similarly *market scope* refers to issues of organizational coverage, such as market segments, market types (business to consumer, business to business etc.) and geographic coverage of markets served.

Many organisations have had to rethink organizational scope and marketing scope through changes in information availability and flow. Very little peer-reviewed empirical research is available exploring these issues, however practical examples abound. For example, the BBC (British Broadcasting Corporation) has embraced e-business and as a consequence, has undergone a significant change in the scope of the services that it provides and customers that it serves. The BBC has recognized that traditional delivery of programming is changing due to digital technology, and ever-increasing competition for viewers from various satellite and digital competitor channels, through devices such as cable services, smart TVs and set-top boxes. The BBC, which was once primarily a producer and broadcaster of television and radio programmes, is now a provider of an up-to-the minute information service made available via its on-line services. Through the BBC's web-site users can access all manner of information from news, weather, and sport; all of which is updated every minute. In addition to this, visitors to the BBC web-site are able to access television and radio program content. The BBC has also broadened the scope of its service offering by providing on-line learning and knowledge across a variety of subjects from food and cookery to wildlife and history. These on-line services are available across a wide-range of technology platforms, including PCs, smart-phones and tablet computers. As such, the BBC has moved its scope significantly.

4.2 Marketing Strategy

Marketing strategy is defined as the development of "effective responses to changing market environments by defining market segments, and developing and positioning product (or service) offerings for those target markets" (Hooley et al. 2012). Marketing strategy is primarily concerned with gathering and analysing useful information and enacting (or implementing) strategic and tactical decisions, in order to gain competitive advantage into the long-term. Varadarajan (2010) cites the strategy formulation process, strategy content and strategy implementation

and, although this appears rather narrow in relation to the above, it provides a useful structure to the following discussion.

4.2.1 Strategy Formulation Process

The availability of market and customer-based information has undergone radical change. Never before have organisations, and their customers, had access to the scale and scope of information available about relevant products and services. Customer forums are ubiquitous in many markets, and are being seen as a powerful influence on customer choice. As such, organizations are attempting to capture and use this information as a potential source of competitive advantage. This allows top management teams to have much more information with which to make informed strategic decisions about their current and future mix of products and services. At the same time, organizations themselves have built huge databases from consumer behaviour data (e.g. purchase histories) or other information (e.g. surveys and registrations). Yet, data alone does not answer questions or make decisions, and firms must also develop entirely new competencies in order to leverage these previously-unimaginable data sources.

4.2.2 Strategy Content and Strategy Implementation

Strategy content is informed and shaped by e-Business practices as described above. Strategy implementation has been changed by e-Business practices. The literature suggests that strategy implementation is where many strategies fail (Noble and Mokwa 1999). The strategy may be well conceived, but if it is not implemented successfully then the strategy will fail to achieve its goals (Hickson et al. 2003). As such, many organisations have incorporated e-Business practices into their strategy implementation process in order to improve efficiency and effectiveness in this vital area. In global organisations, where simultaneous dissemination of strategic initiatives is problematic, webinars and video conferencing have replaced telephone calls and poor-quality faxes. Hence, in implementation, very little room for misinterpretation is available through face to face media. Furthermore, e-business practices such as remote video-conferencing reduce the need for lengthy travel for face-to-face meetings. Marketing strategy implementation frequently involves multiple stakeholders, both internal to the organization (e.g. subsidiaries, shareholders) and external to the organization (e.g. suppliers, customers, consultants and advisors), who are often based in multiple global locations. Therefore e-business practices such as video-conferencing can help to avoid the disruption and delays caused by travel for face-to-face meetings, and thus facilitates the rapid resolution of issues that arise during implementation. Such practices also avoid the escalation of unnecessary costs during implementation, which is a common cause of unsuccessful strategy implementation.

Additionally, control mechanisms are available whereby specific key targets and deadlines for the successful strategy implementation can be monitored from anywhere in the world. Hence strategy makers, and those in charge of delivering the strategy, are acting together with minimal (if any) delay. Vauxhall Motors (a UK subsidiary of General Motors), the automotive manufacturer, has used e-business technology to good effect in order to track the effectiveness of national and regional marketing activity through its retail traffic monitor. The retail traffic monitor captures the number of potential customers entering showrooms on a daily basis. This data is fed back to head office where it is then used by the central marketing department to evaluate the effects of specific marketing campaigns, both at a national and regional level. Of course, as alluded to above, the data itself is merely the enabler, and the key is for decision makers to use the data to inform better marketing decisions.

Furthermore, the growth in Customer Relationship Management (CRM) as an academic notion and also a practical (largely IT-driven) tool has facilitated a more iterative approach to strategy making. When used correctly (and research shows that this is not always the case), organizations with effective CRM systems are able to access (and hopefully utilise) relevant and up-to-the-minute customer information, thereby allowing questions of a strategic and tactical nature to be answered and addressed in a timely fashion.

4.3 Marketing Strategy Behaviors

The Marketing Strategy Behaviors presented in Table 1 are; competitive behavior, cooperative behavior, and collusive behavior. Hence our discussion will focus on these.

With regard to competition, E-Business has increased levels of competitive behavior in many markets and the term 'hyper-competition' (D'Aveni 1994), is not out of place in this context. The growth and use of information is described above, and this has had a significant impact on the pace at which organizations are expected to gather, analyse and act on market and customer-based information; with unrealised expectations penalised by the market as lost share or reduced sales.

In the absence of a precise definition of cooperative behavior we limit our discussions to cooperation between an organization and competitors, customers and suppliers.

4.3.1 Cooperative Behavior with Competitors

Amazon, the on-line retailer, allows rival competitors to sell items through the Amazon marketplace section of their web site. This move has been followed by rival retailers such as Tesco. By allowing competitors to sell products through its web-site, Amazon benefits from being able to offer customers a broad range of

products, as well as from increased volumes of visitors to their website. Amazon also earns a commission on items that third parties sell through their web site. This is an archetypal example of e-Business enabling co-operative arrangements which avoid the typical zero-sum notion of competition.

Cooperative Behaviors with Customers: Many organizations see their customers as being key to innovation and social media is an important enabling factor in this process. For example Kia, the Korean automotive manufacturer, has overhauled the design of seats in certain models as a direct result of on-line customer feedback that the company became aware of through various social networking web-sites and blogs. Similarly, the Ford Motor Company has created a web-site specifically to allow users to post feedback and ideas relating to their products, and to allow them to interact and comment on other users' feedback and suggestions. The ability to capture the public's ideas, opinions and debates is a vital input into the innovation process, and offers a rich source of creativity for organizations that are able and willing to embrace such e-business practices.

4.3.2 Cooperative Behavior with Suppliers

The automotive industry has long been dependent upon technology to enable lean manufacturing and just-in-time supplier deliveries. The seamless supply chains of the automotive manufacturers are made possible through Electronic Data Interchange (EDI). EDI effectively integrates the systems of both manufacturer and supplier to enable real-time information to be exchanged concerning demand forecasts, production scheduling, inventory levels and lead times.

In modern organizations, collusive behavior between organisations is frowned upon. This is not, however, solely a modern concern:

> People of the same trade seldom meet together, even for merriment and diversion, but the conversation ends in a conspiracy against the public, or in some contrivance to raise prices. It is impossible indeed to prevent such meetings, by any law which either could be executed, or would be consistent with liberty or justice. But though the law cannot hinder people of the same trade from sometimes assembling together, it ought to do nothing to facilitate such assemblies; much less to render them necessary. (Smith 1776).

Even so, many examples of modern organizations colluding with each other and also suppliers are available; and high profile examples from the financial sector are widely cited. However, in light of an extremely litigious Western tradition, the authors feel that discretion is the better part of valour, and we would not wish to cite any specific examples here. What is clear however, is that the internet is a largely unregulated space where people (or strategic decision makers in organizations), can indeed "meet together". While a high profile individual from any organization would be ill-advised to conduct any activity that could be construed as collusive in an unregulated space, the useful and detailed information on products, services and, on occasion individuals, available to those willing to search, is truly monumental. It is highly unlikely that none of this is being used to

inform industry-wide "off-line" conversations (between parties both internal and external to the organization) about strategic issues on, for example, price and service levels.

4.4 Context

In terms of context, the issues cited by Varadarajan (2010) as being related to strategic marketing are numerous and far reaching. However, in the absence of clear and specific definitions of each of the issues, and also the intuitive similarity between some, we focus on the core strategic marketing issues of Market Orientation and Organizational Culture and Climate.

4.4.1 Market Orientation

Market orientation is a measure of an organization's ability to generate, disseminate and respond to market intelligence (Kohli and Jaworski 1990). While some debate exists in the literature (Day and Wensley 1988; Narver and Slater 1990; Slater and Narver 1994), much empirical evidence highlights a significant and positive relationship between organizational market orientation and performance. Given the discussions above, the potential for organizations to generate market intelligence exists, but can be limited by internal resources. Hence an organization could compete in a market where intelligence on products and services is widely available; possibly in the form of customer forums and discussion boards. However, if organizational resources do not flow into building capacity to take advantage of this opportunity, then the organization is at a potential competitive disadvantage relative to competitors willing to invest. This is but one element of market orientation however, and organizations also have to disseminate market intelligence internally, as well as respond to it in a timely way in order to reap the cited performance benefits. Dissemination can take pace through electronic means and this is referred to above with reference to CRM systems, strategy formulation and strategy implementation and control.

4.4.2 Organizational Culture and Organizational Climate

While a full review of the differences between organizational culture and organizational climate are somewhat beyond the scope of this chapter, a brief synopsis to aid our discussion is presented.

Organizational *culture* is defined as:

> A pattern of shared basic assumptions that the group learned as it solved its problems that has worked well enough to be considered valid and is passed on to new members as the correct way to perceive, think, and feel in relation to those problems. (Schein 2004)

Another highly cited definition is that of Gareth Morgan (1997) who suggests organizational culture is:

> The set of the set of beliefs, values, and norms, together with symbols like dramatized events and personalities, that represent the unique character of an organization, and provides the context for action in it and by it.

The definitions above share underlying themes. These are a common understanding between organizational players of how to act, behave, think and take certain decisions. These are perpetuated presumably through systemic and ritualistic means.

Conversely, organizational *climate* is defined as:

> the process of quantifying the "culture" of an organization, it precedes the notion of organizational culture. It is a set of properties of the work environment, perceived directly or indirectly by the employees, that is assumed to be a major force in influencing employee behavior (Ivancevich et al. 2007).

According to the definitions presented above, the difference between organizational culture and organizational climate appears to be the level of analysis. Culture is an aggregate and somewhat abstract measure, whereas climate refers to very specific and measureable criteria observed at the individual level. In any case, the impact of e-Business, as defined here, has potentially far reaching implications for organizational culture and also climate. Organizations with a deep rooted culture and climate may be unable to cope with the discontinuity and speed of change required, in environments characterised by high levels of web-based interactions. Customer expectations and industry "norms" are likely to continue to change rapidly, and a cultural type successful for many years (likely to be associated with high levels of organizational inertia) may not have the capacity to change in-line with new competitive frameworks.

As such, we see the example of Blockbuster, the film rental company which has suffered considerably at the hand of Netflix, the online movie provider, as a prime example of how organizational culture can enable or prevent organizations from reaping the opportunities made possible by e-business. Netflix is considered to have a culture which fosters innovation and a focus on superior customer service. As such, Netflix have been able to recognize the changing demands of customers for convenience and flexibility, and have provided customers with the ability to watch films on-line via internet streaming in return for a monthly subscription fee. This negates the need for customers to physically visit the DVD rental shop to collect and return the film; also meaning that customers are not subject to fines for the late return of films. By contrast, Blockbuster's recent corporate history has been characterised by a struggle to adapt and an inability to satisfy customers' changing demands for convenience and they have stuck rigidly to their business model of renting films to customers through their high street stores, charging a flat fee per film.

4.5 Relationships

The focus of this section is on how e-Business has influenced the drivers and outcomes of business relationships. The relationships of interest here are those that exist between organizations, or more specifically organizational representatives. There is a growing body of research that suggests business relationships are being fundamentally changed by e-Business. For example in the sales domain, recent research suggests that the face-to-face trust-building activities of sales people, considered central tenets of theory in this area, are being eroded as drivers of relationship success. Furthermore, evidence suggests a generational effect, whereby younger buyers and sellers are less inclined to value face-to-face interactions, preferring instead a more transactional, "virtual" approach through electronic means (Marshall et al. 2012). There is nothing to suggest that the inferences made here in the sales domain would be any different in any other sphere of organizational activity, as we are dealing with human behavior and preferences, manifest within a wider social context.

4.5.1 Social Media Interactions

The explosive growth of social media websites has facilitated a blurring of the social life/work boundary. For example, the social networking site Facebook is only 8 years old yet has reached 1 billion active users, approximately 12 % of the world population[5]; and Twitter, the micro-blogging site is 6 years old, yet has approximately 140 million users world-wide.[6]

It is not uncommon for colleagues and associates to be socially networked informally through these sites. Evidence exists to suggest that business interactions are increasingly taking place through these "non-work" environments. While research has highlighted a generational bias, in terms of engagement with the informal networks (Marshall et al. 2012), it is clear that organizational business, or more specifically discussions relating to business issues, are being conducted through non-formal channels. Two main issues arise (although this is clearly a multi-dimensional issue); (a) what impact do these informal channels of communication have on brand-related and general business relationship issues and (b) given that work relationships are taking place outside formal business hours, when do employees "switch off"?

The norms of language and traditional business relationship boundaries simply do not exist in the social media space and hence, there could be a tendency for one

[5] Source: *Bloomberg Businessweek*, October 8-14, 2012: see, also: Huffington Post 2012. Number of active users at Facebook over the years. Available at: <http://www.huffingtonpost.com/huff-wires/20120627/us-tec-google-social-network-facebook-growth/> [Accessed 3 July 2012].

[6] Source: The Guardian 2012. Twitter now has 10 m users in the UK. Available at: <http://www.guardian.co.uk/technology/2012/may/15/twitter-uk-users-10m> [Accessed 3 July 2012].

party (perhaps a buyer or a seller) to "say" something that might offend another party. Indeed, the possibility exists for an off-hand remark to be taken and used within the more formal business relationship, as leverage. Unregulated as this might be, organizations that ignore these issues and, fail to provide advice for employees on social media etiquette, could well be opening a can of worms as far as their business relationships and brands are concerned. Indeed, Chrysler, the US automotive manufacturer parted company with a major supplier; the social media agency New Media Strategies, following an obscene message sent from the company's twitter account, which was being operated by New Media Strategies. The incident resulted in an employee of New Media Strategies being dismissed, and caused a significant amount of embarrassment for Chrysler, who were forced to issue a public apology. Instances such as this have forced other organizations such as Jaguar-Land Rover to adopt a policy whereby all social media communications are subject to review by an internal communications committee before being approved for release.

Burnout is an important and pertinent issue in all industries. Increasing levels of turbulence are manifest in tighter budgets and more competitive markets. Symptomatic of this and, some might argue in part fuelling this, is the rise in social networking, e-mail and instant messaging used by many organizations. This has been exacerbated by smart-devices (internet enabled mobile phones and tablet computers) that has eroded the margins of work and home life. The literature warns of the negatives associated with stress and burnout, both at the organizational and individual level (Taylor et al. 2008). Hence the proliferation in smart devices has resulted in many employees being in danger of having no "away time" from work pressures, and organizations are only just beginning to face up to this (Perlow 2012; Perlow and Porter 2009).

As above, organizations that fail to deal with these issues and, do not have specific policies in place to guide and inform employee behavior with regards to electronic communications, run this risk of losing control of conversations central to their brand and their business relationships.

5 Summary

The locus of these discussions is very clearly at the corporate level, and the impact of e-Business on strategic marketing as a domain of theory and as practice, is significant to say the least.

The previous sections illustrate some of the key issues at play. However, the scale, scope, and pace of change taking place in and around modern organizations is unprecedented and "game changing". It is clear that much of this change is being driven by advances in technology applications in business environments. Organizations that fail to recognise the environmental, organizational and individual impact of e-Business and related issues are in danger of falling behind competitors, unless a successful and defensible niche can be carved out. However,

Table 2 Characteristics of strategic marketing decisions (adapted from Ghemawat 1991)

Characteristics of a strategic marketing decision	
Entail resource commitments that are:	- Difficult to reverse - Large (relative to the norm) - Long-term in orientation - Spread over time (not a single point) - Focused on the achievement of competitive advantage
Entail trade-offs (or choice between competing options)	
Made in light of other strategic choices (where possible dependencies exist)	
Made by top management team	

one thing is certain, current business models are evolving, and have to continue to evolve, if sustainable growth is to be a realistic objective.

The authors of this chapter have not to date met, or indeed are likely to meet, anyone with the title "practitioner of strategic marketing" (although of course one should never say never). The implications presented below are for those who have responsibility for decisions that can be defined as *strategic marketing* decisions, and luckily, there is guidance available in the literature as to what these might be considered to be.

From these criteria, we infer that the implications discussed above are targeted at the top management team. All of whom are senior, by definition, and all will be involved in the decisions and decision making described in Table 2. As such it is vital that issues of organizational inertia are dealt with quickly, as discontinuity is likely to be a facet of everyday life for most organisations. The ability to be flexible and to adapt will also drive business success. Organizations stuck in one mode of operation are likely to lose touch with their markets and customers very quickly indeed; leading to a significant negative impact on performance.

Of course, discussions about new business models and large-scale investments in e-Business applications are relatively easy to write about but, much less easy to implement. Organizations facing very turbulent competitive conditions are likely to have cash flow constraints that may not allow large-scale investments in e-Business, employee training initiatives, and business process reengineering projects, in order to fully embrace the plethora of web-based and technology-led initiatives. However, it would be incorrect to argue simply that resources equate to e-Business capability, and this in turn equates to organizational success. History is replete with seemingly "successful" organizations investing in capability that does not ultimately deliver value for their customers.

Indeed, it is the overriding notion of value that is the key in this context. While unprecedented levels of turbulence exist and, pressure to understand the social space and e-Business in general are great, organizations must not lose sight of basic strategic marketing principles that essentially founded the discipline and created the domain of theory. Value delivery must be central, and take precedence over any trend of fad, no matter how much attention surrounds it. Organizations that invest in e-Business merely because it is new and it seems like the "thing to

do" are potentially wasting scarce resources on capacity that will not ultimately deliver value. Moreover they are actively diverting resources away from areas of their organizations that create value or, could potentially create value if further investment were made. Hence, 'the more things change the more they stay the same' is somewhat of a cliché, but even so wholly appropriate to this discussion.

What is clear is that e-Business practices have impacted on strategic marketing as a domain of study and as practice in a significant way. However, looking forward, if marketers are to recapture the influence some authors suggest has been lost then, the basic principles of value delivery must be adhered to within this new environment.

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A Model of Online Consumer Behavior

Michel Laroche and Marie-Odile Richard

Abstract In this chapter, we develop and explain a model of online consumer behavior which is born out the authors' collective research output in the last 10 years. The model presented is original and derives from previous ones with additional variables. It is based on the SOR paradigm of Mehrabian and Russell (1974). First visitors are exposed to website interfaces. Following exposure to website interfaces are emotional responses (pleasure, arousal and dominance; Mehrabian and Russell 1974) leading to website entertainment (affective atmospherics), flow (skills, challenge and interactivity) and some cognitive atmospherics. Most web atmospherics belong to the latter category (effectiveness, informativeness, structure, and organization) because the concern is to evaluate the impact of information content on other variables. All these dimensions lead to the processing variables such as exploratory behavior, website involvement, product involvement, website attitudes and product attitudes. To complete this model, are outcomes such as purchase intentions and online purchases. Finally we cover some selected important moderators, such as gender, personality variables and culture. We conclude with some ideas for future research, including applications to social media and brand communities, and with some managerial implications.

Keywords Consumer · Online behavior · Web atmospherics · Emotions · Involvement, attitudes · Personality · Gender · Culture

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1 Introduction

The last 20 years saw an exponential growth in the use of the internet through all its manifestations: from 1 million users in 1990 to 2.3 billion in 2012 (www.internetworldstats.com). As Internet usage is increasing worldwide, the focus of managers is shifting from establishing a presence online to developing strategic aspects related to products and advertising. One important objective of firms online remains to effectively communicate with customers. Notwithstanding the attention given to online selling, most firms use websites as a communication tool, rather than for transactions. Websites represent the most important form of interactive advertising, which is one of the fastest growing advertising media today.

Although conceptual and empirical studies focused on the importance of interactive advertising, there is still not an in-depth understanding of the processes of navigating websites, consumer responses to websites characteristics, or the persuasiveness of this medium. Rodríguez-Ardura et al. (2010) developed a very thorough review of web-based consumer behavior studies from the early 1990s till today. This extensive review covered several topics from user profiles, to online purchasing, all the way to the emerging field of social media and brand communities (Laroche et al. 2012), and it demonstrates that this is indeed a wide and growing field of study.

However, in this short chapter we chose to focus more specifically on developing and testing systematic models of the web as a business tool which would allow researchers and marketers to achieve a higher level of understanding. Other researchers may develop some other aspects identified by Rodríguez-Ardura et al. (2010). Thus, the main purpose of this chapter is to develop a comprehensive model of online consumer behavior with the *main focus being on the key role of website navigation.*

2 Theoretical Frameworks

The literature reveals two main theoretical frameworks for online consumer behavior, namely the technology acceptance model and the stimulus-organism-response paradigm.

2.1 Technology Acceptance Model

In the technology acceptance model (TAM), the use of any new technology is a function of behavioral intention to use that technology, which is determined by perceived usefulness and perceived ease of use (Davis 1989). Perceived usefulness (PU) is the degree to which one believes that using the new technology would enhance job performance. Perceived ease of use (PEU) is the degree to which one believes that using the new technology would be free of efforts (Davis 1989). There

have been a number of extensions of the TAM to make it more relevant to today's environment. A meta-analysis by Taylor and Strutton (2010) found some partial support for it, but indicated that other variables were missing. They proposed a conceptual integrated model, which still needs to be formally tested and validated.

However, we strongly believe that more fruitful developments of original models of online consumer behavior will be based on the S–O–R paradigm instead of the TAM model. The latter was more useful during the adoption phase of the Internet, mobile technology, and others; we believe that it will likely be less relevant as the use of the Internet (and other recent technologies) is becoming universal and Internet skills and experience are more common. However, some useful dimensions of TAM may be adapted and incorporated into the development of original models on online consumer behavior. Over time, with additions and modifications, it is likely that these two alternative approaches will converge to a common integrated model.

2.2 Stimulus-organism-response Model

Mehrabian and Russell (1974) developed a model based on the Stimulus-Organism-Response (SOR) paradigm. According to the S–O–R framework, features of the environment (Stimulus) are related to the individual's responses (Response) within the environment, mediated by emotional states (Organism). Responses to the environment can be considered as either approach or avoidance behaviors, as described in Table 1. We will use this framework to develop the model described in this chapter.

3 Model Development

Based on Mehrabian and Russell (1974), the model is divided into three parts: Stimuli, Organism and Outcomes. In terms of stimuli, Eroglu et al. (2001) identified low and high task-relevant cues. First visitors are exposed to website

Table 1 SOR and approach-avoidance behaviors

Approach	Avoidance
Desire to stay in the environment	Desire to get out of the environment
Desire to look around and explore the environment	Tendency to avoid moving through or interacting with the environment
Desire to communicate with others in the environment	Tendency to avoid interacting with others in the environment
Degree of enhancement of performance and satisfaction with task performances	Degree of hindrance of performance and satisfaction with task performances

Source Mehrabian and Russell (1974)

interfaces (such as font, and color). Following exposure to these website interfaces emotional responses (pleasure, arousal and dominance; Mehrabian and Russell 1974) are developed leading to website entertainment (affective atmospherics), the achievement of flow and some cognitive atmospherics. Most web atmospherics belong to the latter category (effectiveness of information content, informativeness, structure, and organization) because the concern is to evaluate the impact of information content on other variables. All these dimensions lead to the processing variables such as exploratory behavior, website involvement, product involvement, website attitudes and product attitudes. To complete this model, are outcome variables such as purchase intentions and online purchases. Finally we cover some selected important moderators, such as gender, personality variables and culture. Figure 1 presents the complete model.

3.1 Pre-attention: Website Interfaces

Mazaheri et al. (2011) were the first to divide site environmental variables into two categories: website interfaces and website atmospherics. Pre-attention cues–such as text color, size, and background music (i.e., interfaces)–are the visual and aural dimensions of websites that *subconsciously* impact consumer's emotions at the initial exposure to the website. Website atmospherics, such as site structure, organization, informativeness, effectiveness of information content and entertainment,

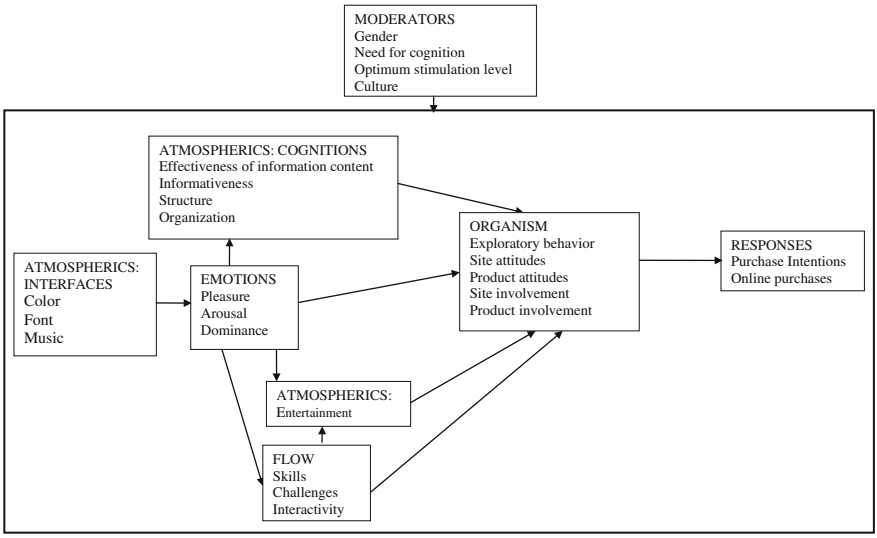

Fig. 1 A model of online consumer behavior

need customers' own evaluations and are influenced by consumers' emotions. Thus, we propose the following sequence of effects: website interfaces → emotions → website atmospherics

3.2 Emotional Responses to the Website

Several definitions of emotions are found in the literature. Mehrabian and Russell (1974) developed a three-dimensional scale of emotions (PAD: pleasure, arousal, and dominance) to capture emotional responses to environmental stimuli. The PAD scale is the most suitable framework for studying the influence of atmospherics on consumer behavior. *Pleasure* is the degree to which one feels good, joyful, happy, or satisfied in a situation. In online contexts, pleasure is akin to "website likeability" (Poels and Dewitte 2008). *Arousal* is the degree to which one feels stimulated, active, or alert. In online contexts, arousal is akin to "website motivational power" (Poels and Dewitte 2008). *Dominance* is the degree to which one feels unrestricted or free to act, controlling, influential, or autonomous. This last dimension was ignored in previous studies, as Russell (1979) stated that pleasure and arousal can represent the range of emotions exhibited in response to environmental stimuli. However, as Richard (2005) argued, dominance becomes a relevant emotional response as customers have more control over their environment. In online contexts, dominance is akin to "website controlling power" (Mazaheri et al. 2011).

3.3 Cognitive Responses to the Website

3.3.1 Informativeness

For Hoffman and Novak (1996) informativeness is the ability of a website to make information available. A site may be high on informativeness irrespective of the manner of presentation. Concerns about information overload are not related to the ability of the website to provide useful information. Thus, informativeness is a perceptual construct, and is not the same as the actual amount of information available on a website, even though it may be correlated with it. Informativeness focuses on the site as an interactive provider. Information often available on a website is product information and the perception of the site content may be measured by the degree by which it is considered to be informative (Huizingh 2000). An informative site provides detailed specific information on products, the company or other relevant topics. With better search engines and browsers, faster downloading, sites are becoming more advanced, with information on the company, products, non-commercial information; transactions; and entertainment (Huizingh 2000). Lohse et al. (2000) find that search for product information is the

most important predictor of online purchases. Finally, for Chen et al. (Chen et al. 2002), informativeness is closely related to attitudes toward the website.

3.3.2 Effectiveness of Information Content

While informativeness is an important characteristic, how information is provided and the type of information are also important. There is a need for another variable to capture the nature of the information provided in the site. Montoya-Weiss et al. (2003) defined the "quality of the site information content" based on three characteristics: information utility, accuracy, and timeliness. Vrechopoulos et al. (2004) used variables such as "perceived usefulness" and "ease of use" as the measures of effective virtual shopping environments. Consistent with Richard (2005) and Richard and Chandra (2005), effectiveness of the information content is the degree to which the information on the website is accurate, up-to-date, complete, and relevant to visitors.

3.3.3 Structure and Organization

In retail contexts, layouts are important to the success of retailers, so it is online, as it is easy to leave a site to surf competitive sites. Among all design elements, signage is an important one. In an online context, layout refers to the *structure* of the website. Huizingh (2000) reports four navigational types of structure: a tree, a tree with a return-to-home page button, a tree with some horizontal links and an extensive network. Most sites have a simple structure: over 60 % had a tree structure or a tree structure with a back to home page button. For Poruban (2002), a tree structure helps consumers' move and access information easily. The more efficient and effective the structure is, the better the ability to process product information, diminishing cost of search, permitting a faster search, increasing the probability of success, and enhancing attitudes toward the website (Elliott and Speck 2005). Thus, consumers surfing the site are more likely to acquire the information needed to develop purchase intentions and also positive attitudes toward the retailers and their websites (Griffith 2005).

At first, the organization of the information was not a major concern of website designers. Over time, they developed good website designs, and found that a great deal of information on a site may be interesting to visitors *if* they find the presentation logical and easy to understand. *Organization* is the ability of a website to arrange content, information, images, and graphics to increase the clarity of the information provided and to make it easier for visitors to find the information they need (Chen and Wells 1999). Organization is evaluated by elements such as effective arrangement of content/hyperlinks/graphics, its e-comprehension, its readability, the chunking of its information and its complexity (Chen and Wells 1999; Bauer et al. 2002; Leong et al. 2002).

3.4 Flow

3.4.1 Skills

For Novak et al. (2000) skills are the consumer's capacity for action during online navigation. Perceived skills, as well as perceived challenges, are positively associated with the achievement of flow which predicts exploratory behavior. Although these constructs operate independently, studies demonstrate that high skills and high challenges lead to satisfying consumer experiences on the Internet (Csikszentmihalyi 1977). People with more Internet-related skills perceive the sites visited as more interactive (Jee and Lee 2002).

3.4.2 Challenge

For Novak et al. (2000) challenges are opportunities for action on the Internet. To obtain an autotelic experience, flow arises from a balance between challenges and skills (Csikszentmihalyi 1977). Skills at navigating the web do not generally affect the surfing experiences and behavior of visitors, since those planning to make online purchases already developed basic navigating skills. But, positive challenges presented by a site could have an influence on web experiences, since visitors must use their skills and abilities in navigating the site, learning how to interact with it, process information and make decisions on purchase of needed products. Conversely, negative challenges lead to slow downloading times, frustration and aborted buying processes. Positive challenges lead to positive attitudes toward the website and the product, as well as purchase intentions and behavior (Koufaris et al. 2001; Luna et al. 2002). Challenges are positively related to attitudes towards the site only if the challenge level is not excessive.

3.4.3 Interactivity

The Internet can incorporate high levels of vividness and interactivity that traditional media cannot (Coyle and Thorson 2001). Many activities are classified as interactivity such as clicking, providing feedback, or information search (Gallagher et al. 2001). For Liu and Shrum (2002) *interactivity* is "the degree to which two or more communication parties can act on each other, on the communication medium, and on the messages and the degree to which such influences are synchronized." They proposed three dimensions: (1) active control: ability to voluntarily participate in and instrumentally influence a communication; (2) two-way communication: bi-directional flow of information; and (3) synchronicity: speed of the interaction. It is the perceptions that the site provides effective and personalized methods to search and retrieve information, and permits surfers to find the needed information to which they would be exposed (Luna et al. 2002;

Fortin and Dholakia 2000). Sundar et al. (2003) showed that interactivity helps in customization, i.e., each surfer receives unique combinations of messages. They found positive correlations between perceived interactivity and perceived relevance of, and involvement with, information content, which predicted website attitudes.

3.5 Website Entertainment

For McQuail (1983), the value of entertainment is in its ability to fulfill needs for escapism, diversion, aesthetic enjoyment or emotional release. Although entertainment is a peripheral cue, it is important for visitors to determine if the site is worth revisiting. For Katerattanakul (2002), many surf online just for information or pure enjoyment. The effectiveness of a website depends on whether visitors feel that it is capable of attracting their attention by being fun, exciting, pleasurable, enjoyable, or entertaining (Bruner and Kumar 2000). Uses of interesting themes, good graphics, or appealing designs contribute to a website being perceived as entertaining (Chakraborty et al. 2003). Entertainment involves sensory and hedonic stimuli (e.g., color, music, action, and interactivity) that promote enjoyment while using a site. Like brick-and mortar shoppers, e-shoppers prefer experiences that create positive feelings. Research suggests that vividness, aesthetically pleasing elements, and engaging material are positively related to website attitudes (Coyle and Thorson 2001; Donthu 2001; Kwon et al. 2002; McMillan et al. 2003). Entertainment increases attitude toward online shopping (Vijayasarathy and Jones 2000), and intention to shop online (Lynch et al. 2001). People with greater perceptions of a site's entertainment value have more positive attitudes toward websites, and develop more positive attitudes toward the brand and stronger purchase intentions (McMillan et al. 2003).

3.6 Exploratory Behavior

Exploratory behavior is the "behavior with the sole function of changing the stimulus field" (Berlyne 1963). Theory and empirical studies suggest that a two-factor conceptualization of exploratory behavior is useful: exploratory acquisition of products and exploratory information seeking (Baumgartner and Steenkamp 1996). Browsing, one form of exploratory behavior, is performed when surfers do not have precise knowledge of available information, are not sure whether their requirements can be met or how these requirements may be achieved. Browsing can be either general or purposeful. "Purposive" browsing is when surfers have specific requirements, whereas general browsing is an opportunity for surfers to fine-tune the perceptions of their requirements or to keep themselves up-to-date on the latest changes in a specific field (Rowley 2000). Surfers' exploratory behavior, characterized by information-search or exploration through purchasing, influences

their attitudes toward the website. The more they explore the possibilities offered by the site, the more they fine-tune their requirements and have a positive idea of the site they visit, triggering approach behavior.

3.7 Involvement Toward the Product and the Website

Involvement is a motivational state influenced by perceptions of the object's relevance based on inherent needs, values and interests (Zaichkowsky 1985). Its main antecedents are the characteristics of the person, the stimulus/object, and the situation (Zaichkowsky 1985). There are two kinds of involvement: enduring and situational involvement. *Enduring involvement* is a predictor of behavior such as information search (Higie and Feick 1989). Enduring involvement (measured as importance) directly predicts skills and challenges, two antecedents of flow (Novak et al. 2000). *Situational involvement* provides a link between a product or a situation and outcomes or consequences of that situation. It leads to an increase in both attention and information processing because of the belief that these efforts will produce favorable outcomes (Schmidt and Spreng 1996). However, its role had not been explored as well as goal-directed and experiential navigation behaviors (Novak et al. 2000). In an internet context a distinction is made between product (enduring) involvement and website (situational) involvement. More explicitly, there are motivations that are both goal-directed (i.e., to obtain information) and experiential (i.e., to be entertained). Goal-directed use of the Internet suggests that surfers use it in an intentional selective manner, reflecting a deliberate exposure to specific content. When users log on, they have a specific objective in mind. In contrast, when people use the Internet for diversion, escape, and/or relaxation (i.e., experiential use), there is no specific outcome-oriented goal. The focus is more directed on the medium than on special content and focuses on the satisfactions offered by the medium itself (Perse and Greenberg-Dunn 1998).

However, as online surfers are active and involved, researchers looked for factors influencing motivation. The flow experience is positively correlated with fun, recreational and experiential uses of the Web, expected use of the Internet in the future, and the amount of time consumers spend online, but negatively associated with employing the Internet for work-related activities (Korgaonkar and Wolin 1999). In that way, surfers who experience flow on the Internet search online for shopping experiences that emphasize ease of use. Task-oriented activities (e.g., work, online search for product information and purchase) relate to skills and control, but not flow.

The Elaboration Likelihood Model suggests that involvement affects motivation to process information (Cacioppo et al. 1986). Highly involved individuals are more likely to access a product-specific site, explore product-specific information, and generate thoughts about products on this site. If these product-related arguments are strong, involved shoppers are more likely to form positive attitudes toward the products offered and the site itself. Conversely, lowly involved surfers

are less likely to look for product-related information and more likely attend to peripheral content. Entertainment elements are more peripheral than central, and entertainment should be more important for low involved surfers. Entertainment is also significant in explaining attitude toward a website, especially for low involved surfers (Elliott and Speck 2005). The differences between low and high involved surfers may reflect a difference between peripheral and central processing. Peripheral processors (low) are less purposeful, more easily attracted to extraneous design elements, and more satisfied by them. Currency is a determinant of attitude toward a website, especially for high involved surfers. Fogg et al. (2002) find that the frequency of updates is strongly related to website credibility. This suggests that e-tailers must not merely update website information; they must signal it. The relationship between involvement and website attitudes is partially dependent on the characteristics of the site (Balabanis and Reynolds 2001). Prior attitudes of consumers towards a brand give birth to attitudes toward the website associated with that brand (Balabanis and Reynolds 2001). Harvin (2000) also indicates that consumers are more comfortable with strong off-line brands they already know and trust. Yoo and Stout (2001) posit that consumers with a high level of product involvement have more intentions to interact with a website, leading to more extensive search and more interactive functions tried.

3.8 Attitudes Toward the Website

For Laczniak and Muehling (1990) attitudes toward an ad is the predisposition of individuals to answer favorably or not to a particular ad stimulus during an exposure occasion. Stevenson et al. (2000) show that attitude toward the website is worth including in research on websites, their content, and the ads they include. Shimp (1981) finds that ad attitudes influence brand attitudes and purchase intentions. By analogy, attitudes toward the website should be a useful indicator of site value. A website can be estimated according to three dimensions (entertainment, informativeness and organization) which relate to attitudes toward websites (Chen et al. 2002). If websites reflect the characteristics of traditional ads, attitudes toward the website should lead to consequences identical to those found in attitude research (Jee and Lee 2002). Website attitudes have a positive impact on brand attitudes and purchase intentions (i.e., hierarchy of effects model) (Bruner and Kumar 2000). Finally, attitudes toward the company behind the site may be related to attitudes toward a website (Supphellen and Nysveen 2001).

3.9 Online Purchasing

Online purchasing is the most rapidly growing form of shopping, with sales growth rates that surpass buying through traditional retailing. Among reasons cited for abandoning information search processes and shopping trials, researchers include a

lack of enthusiasm to supply personal and credit card information, technical problems with sites, and problems in locating products. Thus, consumer search experiences at retailers' websites are determinants of their online purchasing behaviors (Shim et al. 2001). If search intentions play a central role in predicting purchase intentions, search attitudes are valuable for consumer purchasing on the Web. Consequently, a no-purchase decision is the consequence of unfavorable reactions to a site rather than a broader lack of interest in this medium (Shim et al. 2001). Search intentions mediate the relationships between purchase intentions and key antecedents of purchase intentions, chiefly when shopping online. The perception that the Internet's role in consumer information search is one of its most pronounced features indicates that information search online will continue to progress as a major vehicle for comparison shopping as technologies develop (Dickson 2000; Rowley 2000).

Intentions consist of motivational components of behavior (purchase) and are characterized by the degree of efforts one exerts to perform this behavior (Shim et al. 2001). A short intense flow state can move consumers to buying in an expedient manner by providing feelings of dominance that result from flow, while reducing the amount of deliberation time necessary before buying (Smith and Sivakumar 2004). Shim et al. (2001) show that intention to use the Internet to search for information for search goods is not only the strongest predictor of Internet purchase intentions but also mediates the relationships between purchase intentions and predictors such as attitudes toward online shopping, perceived control and online purchase experience.

3.10 Influence of Moderators (Personality, Gender, and Culture)

3.10.1 Need for Cognition

Need for cognition (NFC) was conceptualized by Cohen et al. (1955) as a need to understand and make reasonable the experiential world. For Cacioppo and Petty (1989), NFC is a stable individual difference in people's tendency to engage in and enjoy effortful cognitive activity. Low NFC is defined as the relative absence of motivation for effortful cognitive activities that defines high NFC. People with high NFC are intrinsically motivated intellectually, tend to exhibit curiosity, and are tolerant of different ideas (Cacioppo and Petty 1989). Haugtvedt and Petty (1992) state that, even though attitudes and beliefs of high and low NFC people may be identical after a persuasive communication, those of high NFC people display a greater persistence over time and a greater resistance to counter-messages than low NFC ones.

NFC has an impact in the Internet medium. High NFC surfers engage in more search activities leading to greater perceived interactivity (Jee and Lee 2002). For Mantel and Kardes (1999) high NFC people are more likely exposed to interactive functions provided by the site or use them compared to low NFC ones. They are likely more interested in the quality of verbal information, than in executional characteristics such as graphics or sound effects (Cacioppo et al. 1986). Conversely, low NFC ones are more prone to the influence of symbolic cues, as they avoid elaborative processing. Compared to low NFC subjects, high NFC ones are more favorable toward a website that combines complex verbal with simple visual elements. From a resource-matching perspective, less relevant peripheral visual cues influence high NFC evaluations.

Sicilia et al. (2005) studied how NFC affects the relationship between attitude toward the website and attitude toward the brand. They find that greater cognitive demands allow high NFC surfers to make an informed decision, and the higher the NFC, the greater the access to product information and the motivation to think about it (Putrevu and Lord 2003). Thus, thinking about the brand by visitors motivated to spend time and effort for processing, information will be greater, and that thinking is likely influenced by their evaluation of the website. This situation suggests the *dual mediation model*. However, low NFC individuals, less motivated to think, adopt a simple approach in their evaluations (Tuten and Bosnjak 2001). They find it less necessary to think about product information provided on the website, and more likely use the characteristics of the website to form their attitude towards the product (Chatterjee et al. 2002). Their opinion towards the website is directly transferred to the product. The model that best fits the online environment is the *affect transfer model*. The difference in how the two groups form attitudes means that those in the low NFC group hold their opinions less firmly than those in the high NFC group.

3.10.2 Optimum Stimulation Level

Optimum Stimulation Level (OSL) is the amount of stimulation people prefer in life (McReynolds 1971). According to Mehrabian and Russell (1974), an individual's preference for an environment is closely linked to one's preferred arousal level: some people prefer quiet settings, whereas others actively search to increase their arousal levels by selecting novel, complex, or unpredictable settings.

High OSL people explore new stimuli because of a higher need for environmental stimulation, while low OSL people are more comfortable with familiar stimuli and avoid new or unusual stimuli. However, some gaps remain in understanding the relationship between OSL and exploratory behavior (Steenkamp and Baumgartner 1992). There is scant research on the relationship between OSL and personality traits, as the only personality traits studied were intolerance for ambiguity, rigidity, and dogmatism. High OSL people more likely possess autotelic personality traits and develop the flow state; low OSL ones more likely experience anxiety in their interactions with computer-mediated environments

(Hoffman and Novak 1996). Relationships between OSL and similar personality traits emerged during the last two decades. Some find that high OSL people likely develop high levels of monotony avoidance, NFC, impulsivity, curiosity, and intolerance of ambiguity and low levels of rigidity and dogmatism (Baumgartner and Steenkamp 1996). High OSL people search for more information than low OSL ones when information acquisition is motivated by curiosity. However, it is difficult to separate true exploratory information seeking from a goal-directed one (Baumgartner and Steenkamp 1996).

3.10.3 Gender

Past experience affects the ability to process information (Cacioppo et al. 1986). We extend this finding to Internet experience, where females use both skills and challenge to impact exploratory behavior, while only males' skills influence exploratory behavior (Richard et al. 2010). Females need not only good skills to navigate through a site without losing their way, to understand fast how to navigate a specific site, but also have many challenges: (1) navigate through the whole site to find information, (2) click on links related to the topic, and/or (3) find information by the use of a browser and/or specific and adequate key words. This is consistent with findings by Novak et al. (2000) explaining that skills and challenge predict online consumer search and purchase behavior. On the other hand, men only use their skills, as they need to navigate efficiently and quickly in the site to get at selected pieces of information. However, there is a negative covariance between skills and challenges, i.e., consumers' skills increase more rapidly than their challenges (which may even decrease over time). Males use more heuristics rules, they navigate the Internet with fewer challenges and they need only their skills to conduct a good search. Conversely, females are challenged to conduct a thorough search, find and gather together all relevant information before making a decision. In addition, males' challenge influence site attitudes and pre-purchase evaluations, while females use challenge to influence site attitudes (Richard et al. 2010). First, it is logical that higher levels of challenge lead to a better evaluation of the sites, and this is true for both genders. Second, the impact of challenge on pre-purchase evaluations for males only indicates that once they find the site challenging, and assuming they found the right amount of information, they find the product attractive and report higher pre-purchase evaluations. This is consistent with the finding that males are more likely to purchase online, while females would use the Internet to thoroughly gather information and later decide whether to buy in brick-and-mortar stores (Wolin and Korgaonkar 2003).

Effectiveness had effects only on males' exploratory behavior, while it has a more complex effect on females by having also a link with site involvement. Females engage in more detailed elaboration and examination of the information than males. They explore and browse more the site in order to gather all the information, inducing a more pronounced exploratory behavior than males and thus, use the central route. On the other hand, males do not process all available

information as they are guided by overall themes and schemas, meaning they explore the site less once the information is found and they use more the peripheral route even though they give attention for any information they find. Males do not memorize information as much as females as they are quickly overloaded (Richard et al. 2010). For females it is important to create websites with a great amount of information presented differently (e.g., graphics, tables, texts, and figures), with links related to the topics on which they want information. For males, they do not need a lot of information; until they reach a certain limit, they might be interested by key words, key sentences with graphics, figures, and tables that are easier to digest (e.g., not only a summary of the information, but also a visual reinforcement of the verbal information). Finally, site attitudes are impacted by site structure only for males. This is the only central cue that has a direct effect on site attitudes. The easier a site is to use, the more cognitions are available to process information (Griffith 2005). Thus, the more structured the site is, the more males find it easy to navigate and access information, to quickly acquire information, and develop approach behavior toward it. Conversely, female collect information regardless of the structure of the site as they would not be affected by it.

There are two kinds of search processes: active and passive. Passini's (1984) theory is a useful one: *wayfinding* is "the cognitive ability to assimilate spatial information, make maps to find one's way, make decisions and execute them." This applies to surfing the Internet. Males are passive way finders as they search for landmarks (visualizers) and use more store information, whereas females are active way finders (verbalizers) and rely more on verbal messages from other people (Chebat et al. 2005). Kozhevnikov et al. (2005, 725) found that "females tend to be object visualizers and males tend to be spatial visualizers," i.e., females use more object properties (such as shapes and colors) while males use more spatial properties (such as location and spatial relations). These differences are explained by the activation of different cerebral areas such as the right parietal and prefrontal areas in women and the left hippocampal region in men for Internet navigation. As females use an analytical-serial strategy and process information in a comprehensive manner, they activate the right frontal areas, whereas men who process on a piecemeal basis activate the parietal areas.

3.10.4 Culture

Culture reflects the preferences and attitudes of people. For Hofstede (1991), culture is the "collective programming of the mind which distinguishes the members of one group … of people from those of another" (p. 4). Most marketing studies adopt this framework in which national cultures are differentiated on five dimensions: power distance, masculinity/femininity, long-term/short-term orientation, uncertainty avoidance, and individualism/collectivism. Here we review application of this framework to the Internet.

Individualism is the extent to which the members of a society pursue primarily their own interests rather than that of others. In collectivist societies individuals

look after the interests of their group before themselves. Individualist customers are high on self-reliance, competitiveness, aggressive creativity, conformity, and insecurity (Hsu 1983). From studies in psychology, emotional features are stronger in individualistic societies (e.g. Schimack et al. 2002). Moreover, for Triandis (1995), collectivism emphasizes social norms and duty defined by the group rather than "pleasure" seeking. For Steenkamp and Geyskens (2006), in individualistic cultures, the effect of emotional experience is larger than in collectivistic cultures. They use two dimensions of emotions (pleasure and arousal) and find support for "pleasure." Individuals from different cultures tend to focus on different types of cues: individualism emphasizes more individual responses to context rather than context and cues. Considering the nature of individualism and collectivism, Davis et al. (2008) find that high task cues–the site descriptors on the screen which facilitate shopping goal attainment–are more central to the decision-making process for individualistic customers. The symbolic-subjective culture of collectivism is context sensitive; therefore, collectivistic customers rate the low task cues–the site descriptors that are inconsequential to the completion of shopping task as more helpful (Davis et al. 2008).

Power Distance is the extent to which a society accepts unequal distribution of power (Hofstede 1991). Larger power distance implies a greater tolerance of disparity of distribution of wealth and power in a society. Thus, in high power distance societies people are more task-oriented and less people-oriented (Hofstede 1991). In online contexts, dominance should be the most influential element in a high power distance society. Thus, for task-oriented customers, feeling of "control" in doing the task is more important compared to people-oriented customers (Mazaheri et al. 2011). The task is to obtain the required information from the website.

Long-term orientation is the extent to which members of a society place great significance on the values of thrift, persistence, and long term alliances (Hofstede 1991). Societies with short-term orientation value personal steadiness and stability, saving face, favors, and gifts (Hofstede 1991). For Furrer et al. (2000), long-term orientation associate with responsive and reliable service. Thus, customers in long-term oriented societies have higher expectations about the amount of information and effectiveness of information provided in the website. Long-term oriented individuals emphasize persistence and long term alliances (Tsikriktsis 2002).

Uncertainty avoidance is the extent to which members of a society feel threatened by uncertain or unknown situations (Hofstede 1991). Customers in a high uncertainty avoidance culture tend to avoid uncertain situations. Seeking and collecting additional information is a strategy to reduce the level of uncertainty and risk involved in purchasing decisions (Murray 1991). Therefore, the impacts of site informativeness and effectiveness of information content on site attitudes, site involvement, and purchase intentions are higher for low uncertainty groups (Mazaheri et al. 2011).

An interesting and important development regarding culture is the globalization of markets influenced by a global consumer culture and the acculturation of consumers worldwide toward this global consumer culture (Cleveland and

Laroche 2007). Martínez-López et al. (2011) developed an integrative conceptual model of the influence of the Internet worldwide in fostering this acculturation to the global consumer culture. This is a most promising approach to further our understanding acculturation toward the global consumer culture.

4 Conclusion and Future Research

4.1 Conceptual Contributions

The model presented in Fig. 1 and developed in this chapter provides a useful framework for understanding online consumer behavior, especially in the context of website navigation. Beyond the mere structure of this original model, we contribute conceptually by clarifying a number of constructs and relationships:

1. The distinction between web interfaces (pre-attentive) and web atmospherics (attentive).
2. The role of all three emotional dimensions, including dominance which was ignored in the past.
3. The distinction between website (situational) and product (enduring) involvement.
4. The important role played by gender and culture (especially the role played by the internet in fostering the global consumer culture).
5. The identification of important personality variables, such as NFC and OSL.
6. The nomological network of relationships, some which have never been tested in the past.

4.2 Directions for Future Research

In addition to the variables identified, researchers could look at developing knowledge along the following lines, among others:

1. Further develop the nature and role of web atmospherics by looking at other variables such as site organization, navigational cues (Dailey 2004) and other forms of site aesthetics.
2. Further develop the measurement, antecedents and consequences of flow, and how to integrate it within a model of web navigation.
3. Further incorporate emotional responses to initial website exposure, such as pleasure, arousal and dominance, and identify their relationships with other variables in the model of online consumer behavior.
4. Incorporate the influences of product intangibility, perceived risk and online trust in a model of online consumer behavior (Laroche et al. 2001).
5. Further develop the dimensions, antecedents and outcomes of e-WOM (word-of-mouth), especially in the context of social media and brand communities.

6. Further develop the role of culture, such as its dimensions, the acculturation process and the global consumer culture, in the model of online consumer behavior.
7. Explore the addition of individual cultural values in the model of web navigation (Schwartz 1994).
8. Develop and incorporate efficient measures of website use, such as click-throughs, and identify their role in the process of website navigation.
9. Further identify major segments of website visitors, depending on motivations for search, product classification and individual differences.

4.3 The Emergence of Social Media and Other Web 2.0 Applications

According to Kaplan and Haenlein (2010, p. 61) a social media is "a group of internet based application that builds on the ideological and technological foundations of Web 2.0, and it allows the creation and exchange of user-generated content." This definition implies that the content is not consumed by people passively anymore. Instead, it is produced, shared and consumed by users actively generating content. There are many different platforms of social media such as social networking, text messaging, shared photos, wikis, blogs, and discussion groups; however, it is mostly coined with such popular Internet based applications as YouTube, Wikipedia, Facebook, Twitter, and Second Life.

For Muniz and O'Guinn (2001, p. 412) a brand community is a "specialized, non-geographically bound community, based on a structured set of social relations among admirers of a brand." The context of these communities is consumption of a good or a service. Like every other community, brand community is made up of its entities including its members, their relationship and sharing essential resources either emotional or material resources. However, McAlexander et al. (2002, p. 38) argue that the most important thing being shared in a brand community is the "creation and negotiation of meaning."

These two emerging applications (including others such as m-commerce) are beginning to be looked out in the same way that website navigation was studied in the last 10 years. There is now a need to develop new models (as the one developed in this chapter) to better understand the formation, development, and dynamics of these applications. Some of the variables identified in this chapter or those identified by Rodríguez-Ardura et al. (2010) could be used to build and test such models.

5 Managerial Implications

In this section, we identify the key managerial implications for the model developed in this chapter. Website designers must:

1. Keep in mind the following sequence of effects: website interfaces → emotions → website atmospherics.
2. Develop site interfaces that generate positive emotions in website visitors, arousal, pleasure *and* dominance.
3. Develop an informative site to provide detailed specific information on products, the company or other relevant topics.
4. Ensure that the information on the site is accurate, up-to-date, complete, and relevant to visitors.
5. Ensure that the site is well structured, and is able to arrange content, information, images, and graphics to increase the clarity of the information provided and to make it easier for visitors to find the information they need.
6. Ensure that the website is able to develop the flow state.
7. Ensure that visitors feel that the website is capable of attracting their attention by being fun, exciting, pleasurable, enjoyable, or entertaining.
8. Develop positive exploratory behavior, and involvement toward the website.
9. Realize the importance of developing highly positive attitudes toward the website and the product.
10. Keep in mind the key differences between high and low NFC visitors, high and low OSL visitors and between male and female visitors.
11. Finally, take into account the key distinctions among cultural dimensions.

In conclusion, it is clear that designing the most effective website is a very challenging task, taking into account all key elements identified in this chapter. However, if done properly, it can bring enormous benefits to the firm.

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Online Consumption Motivations: An Integrated Theoretical Delimitation and Refinement Based on Qualitative Analyses

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Abstract The importance of the Web is growing due to its capacity to provide information, goods and services, and thanks to its capacity to increase the value proposition for consumers. Using online platforms and strategies, companies may provide various benefits, utilitarian and hedonic, which consumers can seek out by means of online consumption processes. The fundamental objective of this paper is to realize an approximation and detailed theoretical delimitationof the structure of motivations associated with online consumption; until now there have only been partial or incomplete contributions in this respect. To this end, an exhaustive literature review was conducted and an initial theoretical proposal was developed, followed by a qualitative study phase aimed at refining said proposal. The dimensions finally arrived at are ten utilitarian motivation categories and eleven hedonic motivation categories. Finally, diverse concluding remarks are presented for academics and practitioners. The most noteworthy research opportunity derived from this study is the evaluation and validation of this motivational structure using confirmatory analyses.

Keywords Consumption motivations · Web · Utilitarian · Hedonic · Delimitation · Integrated approach · Qualitative refinement

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1 Introduction

A large part of the world's population is increasingly using the internet to both develop and support their consumption processes. Online consumption is experiencing spectacular development in OECD countries. In 2011, B2C e-commerce sales generated close to €700 billion in sales worldwide (IMRG 2012). With more than 2 billion of Internet users around the world, and a forecast of about 3.5 billion in the coming years, the electronic markets are full of opportunities for entrepreneurs and new businesses, as well as for consolidated firms on physical markets. Hence, the presence of businesses in this medium is necessary, not only because of the growing importance of electronic purchasing to consumers' budgets, but, above all, because consumers make regular use of the Internet, and especially the Web, to respond to consumption problems.

This chapter establishes an approach to the framework for online consumption motivations. Why do individuals develop online consumption processes? Answering this question implies going to the roots, to the primary causes behind consumers' online consumption behaviors. The motivations represent an important component from among the aspects which define people's behaviors, since they derive from unsatisfied needs and represent, using concrete actions, the benefits which people aim to achieve (Schiffman 2005; Pierters 1993). With respect to the range of consumption experiences, Solomon (2009) distinguishes between utilitarian and hedonic motivations, according to the type of need each motivation leads the consumer to satisfy. Utilitarian motivations include those motivations which orient the consumer towards obtaining functional, economic, rational, practical, or extrinsic benefits; hedonic motivations, on the other hand, are related to emotional or experiential aspects which make the consumption experience, and possible purchase, agreeable and pleasant.

In this chapter, we first analyze the background of the motivations for consumption and justify the logic followed in order to structure the integrated framework of online consumption motivations around two large categories: utilitarian and hedonic. Next, we delimit, according to their utilitarian or hedonic nature, the motivations capable of influencing the consumer's behavior on the Web. This theoretical proposal is, in general, based on an exhaustive review of the principal contributions made by the literature dealing with motivations and, in particular, on the framework of online consumption. The next section presents the qualitative study carried out in order to refine the dimensional structure of utilitarian and hedonic motivations proposed initially. Finally, conclusions are drawn and some final practical considerations are noted.

2 Background

2.1 General Framework: Consumption Motivations

The study of motivations is essential to the understanding of people's behavior. The stimuli and impulses which act as motivations, whether consciously or unconsciously, lead to a reduction in those states of mental tension whose origins are found in some unsatisfied need (Schiffman 2005). In fact, as Pierters points out (1993), motivations are the component at the apex of the hierarchy of aspects which define people's behaviors, since they represent the objectives or benefits people aim to achieve through their actions.

The literature on consumer behavior has distinguished different types of motivations in consumption experiences and has proposed various classifications for them. One of the most accepted classifications, with origins in the field of social psychology (Pieters 1993), differentiates between extrinsic and intrinsic motivations. The former lead to the development of certain activities with the aim of obtaining some benefit other than that obtained from carrying out those activities themselves (Eiser 1986; Teo et al. 1999; Teo 2001); the latter are reflected in the practice of certain behaviors and actions which are in and of themselves interesting and enjoyable to carry out (Malone and Lepper 1987).

Another relevant classification is the one proposed by Sheth (1981), who, in order to explain consumers' decisions within conventional physical environments, distinguishes between: functional motivations, relating to tangible attributes of the value offer (e.g., comfort or convenience, the variety of the assortment, the quality of the merchandising, or the availability of information); and non-functional motivations, associated with intangible attributes of the offer (e.g., interaction with other people, the search for interesting shopping experiences).

For their part, Bellenger and Korgaonkar (1980) distinguish between two types of consumers, according to their shopping orientation: those who are led by motivations of an economic nature and who are mainly interested in making efficient purchase decisions; and those who are guided by recreational motivations and who are mainly interested in having agreeable shopping experiences (Fenech. and O'Cass 2001).

Schiffman (2005) distinguishes between shopping motivations which are rational in nature, leading the consumer to select those alternatives which produce a greater economic utility, and emotional motivations, aimed at achieving personal and subjective objectives.

Solomon (2009) also groups shopping motivations into two categories, according to the type of need they seek to satisfy. This leads him to distinguish between: utilitarian motivations, which lead to the adoption of certain behaviors in order to obtain functional or practical benefits; and hedonic motivations, related to the emotional responses one has when presented with new and agreeable shopping experiences.

Following the review carried out, and leaving aside some details which can be discerned in of each one of the categorizations, it can be concluded that the motivations which drive consumer behavior may be: of an extrinsic, functional nature, driven by criteria which are purely economic, rational or utilitarian; or they may be motivational factors which are intrinsic, non-functional, emotional or hedonist in nature. In the context of online consumption, this typology has generally been summarized in two large groups (see Martínez-López et al. 2006): utilitarian and hedonic.

2.2 *Specific Framework: The Online Consumption Motivations*

Depending on the approach adopted in each case, two different lines of investigation can be distinguished in the studies into consumer motivations within the context of electronic commerce. The first of these lines of investigation focuses on the study of consumer motivations and their influence on website attributes, and vice versa (Alba and Lynch 1997; Childers et al. 2001; Foucault and Scheufele 2002; Swaminathan et al. 1999; Teo et al. 1999; Verhoef and Langerak 2001), revealing the predictive potential of the different perceptions of value the Internet and of the companies' websites in consumer motivations. Meanwhile, the second line of investigation is characterized by papers which have proposed the segmentation of the online consumer community according to, among other aspects, their underlying motivations (e.g., Donthu, and García 1999; Ghosh 1998; Moe 2003; Parsons 2002; Rohm and Swaminathan 2004; Shim et al. 2001; Wolfinbarger and Gilly 2001).

Regardless of the approach, the literature considered aims to discover what leads consumers to shop online. To illustrate this point, we present some of the conclusions reached by previous studies (which have tended usually to pay more attention to the utilitarian facet of motivations):

- The stimulus of greatest importance in online shopping resides in the variety of the assortment (Alba and Lynch 1997).
- Convenience, personalization and interaction can make the Internet a very convincing and persuasive marketing channel (Ghosh 1998).
- Convenience constitutes the most important motivating factor in online shopping, although the social interaction may act to the contrary, putting the brakes on possible purchase decisions (Swaminathan et al. 1999).
- Donthu and García (1999), for their part, believe establishments on the Web should focus on offering variety and convenience to their potential customers.
- Morganosky and Cude (2000) have considered convenience and the interest in saving time to be more important motivations in online grocery shopping.
- Teo (2001) have pointed out the influence of the motivational variable relating to perceived utility on online purchase decisions.

- Motivational aspects relating to social backing, information and availability have also been identified as determining factors in online shopping (Foucault and Scheufele 2002).
- Blake et al. (2005) and Keeney (1999) highlight the influence of certain values, predominantly utilitarian, on electronic commerce.
- Bridges and Florsheim (2008) believe that Web establishments should be equipped, fundamentally, with characteristics which contribute to the attainment of utilitarian goals for consumers, due to their positive effect on online shopping.

Even so, very few studies have considered, jointly, the utilitarian and hedonic motivations capable of influencing online consumption processes. In fact, it has been possible to identify only a few which respond to this perspective (see Bridges and Florsheim 2008; Childers et al. 2001; Martínez-López et al. 2006; Moe 2003; Parsons 2002; To et al. 2007; Wang et al. 2007; Wolfinbarger and Gilly 2001).

3 Utilitarian Consumption Motivations on the Web: A Theoretical-Based Dimensional Proposal

Utilitarian motivations play an important role on the Web. It has been shown, for example, that web salespersons who promote utilitarian values provide their users with high levels of satisfaction, and this results in greater volumes of billing (Bridges and Florsheim 2008; To et al. 2007). However, the studies we found which deal with utilitarian motivations are incomplete (Bridges and Florsheim 2008; Rohm and Swaminathan 2004; To et al. 2007; Wang et al. 2007). That is, there is a need for studies which will conduct an exhaustive study and delimitation of online utilitarian motivations. This explains the need and interest in the delimitation of the dimensional structure of these motivations within the context of electronic commerce.

In this section, we present and define the different groups of utilitarian motivations we defined initially, based on a review of the literature dealing with the utilitarian aspects of consumer motivations, in the physical or traditional markets as well as in the electronic markets.

3.1 Desire for Control

This facet refers to the consumer's intrinsic perception regarding his ability to master the web environment, in order to carry out his online consumption as well as to anticipate the result of his proposed online consumption processes.

Although this concept has received relatively scarce attention in the literature on consumer behavior, in reality it is one of the most studied concepts within the context of social sciences (Lefcourt 1992). According to the principles of social

learning theory, the desire for control would include the online consumers' interest in mastering their immediate environment (that is, the browsing environment) directly, which would, in turn, offer them greater levels of empowerment when determining the result of the browsing processes (see the description of "empowerment" in Hoffman et al. 2003). In the same way, the desire for control would include people's expectations regarding the consequences derived from their actions (Skinner 1996). The desire for control would be tied to the online consumer's interest in assuming control of the applications and the browsing environment, thereby gaining greater levels of authority and status (see To et al. 2007). Likewise, Hoffman and Novak (1996) and Wolfinbarger and Gilly (2001) have detected a greater perception of control in online shopping environments as compared to usual physical channels.

3.2 Autonomy

The second category considered would reflect the online consumers' interest in finding themselves in situations which favor freedom of choice. On the one hand, the field of psychology defines autonomy as a behavioral tendency which is initiated and regulated by the individual's internal interests, once he or she has received and interpreted information coming from the environment (Deci and Ryan 1985). This would be consistent with the findings made by Wolfinbarger and Gilly (2001), who have detected that online shopping, by allowing the consumer to detain and/or recover the purchase decision process with greater facility, eases the pressure on the consumer and offers him or her greater freedom.

3.3 Shopping Convenience/Accessibility/Efficiency

This third group of motivations focuses on the consumer's interest in saving time and effort by shopping online. This category has received considerable attention in the field of consumer behavior within the physical market, as evidenced by the numerous studies emphasizing its relevancy in the election of establishment (for example, Bellenger and Korgaonkar 1980; Darden and Ashton 1974; Eastlick and Feinberg 1999; Gehrt and Shim 1998; Williams et al. 1978). At the same time, this category has been highlighted as a key motor for purchase decisions on electronic channels (Chiang and Dholakia 2003; Forsythe et al. 2006; Morganosky and Cude 2000; Srinivasan et al. 2002), where its importance would be justified not only by the savings in time and effort, due to the elimination of the need to physically travel in order to make the purchase, but also by the absence of wait time, long lines and crowds in the establishment itself (Rohm and Swaminathan 2004). For this reason, previous papers (for example, To et al. 2007; Wolfinbarger and Gilly 2001) have, upon studying utilitarian motivations in online shopping, emphasized

the aspects of convenience. Furthermore, in a similar manner, Mathwick et al. (2002) have observed that online consumers with utilitarian orientations are driven by the desire to make the best purchase possible, investing the least amount of time and in the most efficient manner.

3.4 Broad Selection and Availability/Merchandise Assortment Motive

This dimension deals with the consumer's interest in having a wide and varied offering of goods and services within reach when carrying out consumption processes on the Web. This interest in assortment is related to the principles of information economy (Hauser and Wemerfelt 1990; Ratchford 1980; Stigler 1961) and the consideration that the utility of consumers increases as the number of shopping alternatives (brands, products, and retailers) to which they have easy access goes up; this, however, notwithstanding the problem associated with the excess of information on the Internet and "the information paradox". Likewise, the width of the assortment would correspond to the utilitarian motivation called "selection" or "election" by Wolfinbarger and Gilly (2001), Srinivasan et al. (2002) and To et al. (2007), who have described its positive influence on online shopping.

3.5 Good Value for Money/Economic Utility

This group deals with the search for competitive prices, which would include the interest one has in obtaining the best value for the price as well as in taking advantage of promotions and sales. Economic motivation in online consumption has been documented by Anders (1998), Korgaonkar and Wolin (1999) and Mathwick et al. (2002), among others. Within the electronic markets, as they are such information-rich commercial environments, consumers are able to identify alternatives which offer substantial savings (Brynjolfsson and Smith 2000; Clemons et al. 2002; Lee and Gosain 2002; Strader and Shaw 1999; Zettelmeyer et al. 2006). In this respect, previous papers (Arnold and Reynolds 2003; Parsons 2002; To et al. 2007) have considered, in particular, the motivational aspects related to obtaining great deals and discounts, which would result in the consumer's satisfaction in having reached a personal achievement (see McGuire 1974).

3.6 Information Availability

This refers to the benefits sought out by consumers when gathering useful information (via the Web) in order to carry out consumption processes. The role of the motivations related to the consumer's ability to obtain information in retail

establishments had already been contemplated in the context of conventional commercial environments (see, for example: Bellenger and Korgaonkar 1980). Therefore, it is not surprising that it should take on great importance on the Web (Korgaonkar and Wolin 1999), an environment extremely rich in information and equipped with instruments which significantly reduce search costs as well as costs relating to the evaluation of available alternatives for consumers (Bakos 1997; Brynjolfsson and Smith 2000; Lynch and Ariely 2000). In fact, some empirical evidence regarding its role as a utilitarian motivation in online shopping has been obtained (To et al. 2007; Wolfinbarger and Gilly 2001).

3.7 Customized Product or Service/Co-production

This type of dimension describes the consumer's interest in customizing his demands according to his own needs and preferences. Various studies have analyzed the implications of customization processes within electronic markets as well as the role and principal consequences of said processes in the value and in the experience as perceived by the consumer (e.g. Ansari and Mela 2003 Miceli et al. 2007; Randall et al. 2005; Vesanen and Raulas 2006; Wind and Rangaswamy 2001). Specifically, it has been observed that the advanced forms of customization made possible by Web technology favour the predisposition to shop and to shop online (Srinivasan et al. 2002; Wind and Rangaswamy 2001).

Likewise, customization possibilities are directly related to the co-creation of value during the online consumption process (Pralahad and Ramaswamy 2004). The consumer may adapt the process according to his preferences; the process may be aimed at the attainment or production of innovation, or it may be focused on the innovative contribution at the heart of a collective (Kozinets et al. 2008). In any event, it is expected the perceptions of the consumers regarding the benefits derived from interaction on the Web for the personalization and co-creation of value on particular business websites will contribute to the development of online consumer processes with said businesses in the future (Rodríguez-Ardura et al. 2010; To et al. 2007).

3.8 Ease of Payment

This motivation describes the online consumer's interest in being able to count on a variety of payment options which are wide enough and suitable to their preferences. Although the benefits sought out with respect to payment methods have not usually been considered within the context of distance selling, Eastlick and Feinberg (1999) already pointed out their importance as a motivating factor. On the other hand, the literature on the adoption of innovations within the context of electronic commerce

has paid great attention to online payment systems, although the focus has been on questions related to their security and to the consumers' perception of the risks inherent to online payment (Bhatnagar et al. 2000; Liebermann and Stashevsky 2002; McKnight et al. 2002; Swaminathan et al. 1999; among others).

However, and given that these questions are technically and strategically solvable, it has also been pointed out that they may represent a possible limitation for the takeoff of online transactions more in the short term than in the mid- to long term (Burt and Sparks 2003). On the other hand, it is of even greater interest to consider the motivational aspects related to payments keeping in mind consumers' preferences for reliable and comfortable payment methods, and not so much the technological aspects *per se*.

3.9 Home Environment

This refers to the comfort of doing one's shopping in an agreeable and relaxed environment such as that offered by the home. The Internet allows the consumer to shop from home, without worrying about how he or she is dressed and in a more comfortable manner (Wolfinbarger and Gilly 2001). In this way, consumers who lack free time have the opportunity to do their shopping from the comfort of their own home (Monsuwé et al. 2004). Likewise, the lack of mobility, the difficulty a consumer faces in going to a physical establishment to shop if, for example, he does not have his own car (Avery 1996), may be partially solved by shopping from home, without having to travel (Monsuwé et al. 2004).

3.10 Lack of Sociability

The absence of sociability is the tenth dimension identified following the theoretical review. Shown here are those motivational aspects related to the possibility of avoiding social interaction with other people (be they consumers or salespeople) and of consuming on line without shyness or shame. The consideration, as a motivational source, of the absence of social interaction within the virtual establishment has been demonstrated previously by Wolfinbarger and Gilly (2001) and To et al. (2007), and would find justification in the ideas of Tauber (1972); this author advocated the consideration of diverse motives of a social nature towards the explanation of shopping behaviors. More recently, upon analyzing the importance of social interaction to the choice of retail format, Alba and Lynch (1997) have demonstrated the relatively low levels of social interaction provided by virtual businesses in comparison with that presented in conventional physical environments. For their part, Forsythe et al. (2006) have documented the absence of sociability—which they have denominated ease/comfort of shopping—as a perceived benefit of online shopping.

3.11 Anonymity

This corresponds to the consumer's interest in protecting his or her privacy during the online consumption processes and in carrying out those same processes from the intimacy offered by the home. Anonymity had already been demonstrated to be a relevant motivational dimension in traditional forms of distance selling (Culnan 1993; Eastlick and Feinberg 1999). Furthermore, studies within the electronic context have observed that, on the Web, consumers are even more interested in resorting to anonymity (Hoffman et al. 1999a, b; Korgaonkar and Wolin 1999). This is due to the ease with which, in this medium, it is possible to gather information about consumers, broadcast that information and use it for commercial aims; it is also due to the potential derived from the combined use of the Web, marketing intelligence systems and CRM. Therefore, if we adapt the ideas proposed by previous studies (Goodwin 1991; Marshall 1974) to the electronic context, it becomes clear that the offer of forms of interaction between businesses and consumers which provide anonymity gives shape to a strategy of special value on the Web. Above all, if these forms provide the privacy levels desired by the consumer.

4 Hedonic Consumption Motivations on the Web: A Theoretical-Based Dimensional Proposal

In spite of the importance hedonic motivations acquire in consumption processes on the Web, studies conducted into these motivations are quite scarce. Furthermore, most of them are incomplete, since they tend to focus on a few concrete motivations and do not conduct a thorough approach to the hedonic motives that may be behind browsing and consumption behaviors (see Bridges and Florsheim 2008; Rohm and Swaminathan 2004; To et al. 2007; Wang et al. 2007). Thus, there exists an interesting research opportunity in performing an exhaustive delimitation and validation of this type of motivations.

Much in the same way we presented utilitarian motivations earlier in this paper, in this section we propose and describe up to nine differentiated groups of hedonic motivations are. These were identified after considering, following the review of the literature conducted, the diverse hedonic motivational aspects which have been linked to online consumption.

4.1 Visual Attraction

This motivation category is defined by the online consumer's motivation to browse commercial websites and contents which are attractive and stimulating to the eye; this category has to do with the design, the physical attractiveness and inherent

beauty of the value proposition (Holbrook 1994), as well as the simplicity (Karvonen 2000; Nielsen 1999), the order, the proportion and the symmetry (Fenner 1996; Osborne and Balakian 1968) of the offer presented to the consumer. In e-commerce environments, these issues relate to the perceived attractiveness of the appearance and design of the commercial websites (Ganesh et al. 2010).

This kind of motivation may also be considered logical, on the basis of the evidence presented in various papers, within the context of electronic commerce, which have proven how visual appearance positively influences aspects such as: the pleasure obtained shopping online (Kim et al. 2007), the formation of positive attitudes toward the virtual establishment (Childers et al. 2001; Coyle and Thorson 2001; Fiore et al. 2005), greater levels of satisfaction (De Wulf et al. 2006; Eroglu 2003; McKinney 2004; Zviran et al. 2006), longer visits to the site (Fiore and Jin 2003; Kim et al. 2007; O'Brien 2010), repeat visits (Fiore and Jin 2003), greater purchase intent (Kim et al. 2007; Liang and Lai 2002; Richard 2005; Van der Heijden and Verhagen 2004), and recommendation of the establishment to other consumers (Gorn et al. 2004).

4.2 Sensation Seeking/Entertainment

The next motivation type contemplated here reflects the interest online consumers have in being exposed to events or situations which provide them with new emotions and which entertain them (Kim et al. 2010). That would include the desire for adventure, that is, the interest one has in being exposed to new stimuli and in experiencing the sensation of being in another world (Arnold and Reynolds 2003; Kang and Park-Poaps 2010; Kim 2006).

Evidence exists which indicates that websites which provide high levels of positive sensations successfully improve the consumer's mood and levels of satisfaction (Hoffman and Novak 1996; Webster and Martocchio 1992; Wolfinbarger and Gilly 2001). Likewise, fun influences attitude and online purchase intent in a positive manner (Kim et al. 2010; Koufaris et al. 2001), and this, in turn, increases the likelihood of more visits to the establishment (Fiore and Kim 2007; Kim et al. 2007; Koufaris et al. 2001). For this reason, it should be no surprise that Seo and Green (2008) have identified this motivational category as one of the most relevant to online sports consumption (Seo and Green 2008).

4.3 Exploration/Curiosity

This category would reflect the online consumers' desire to obtain information and knowledge regarding elements which may be novel and which awaken their curiosity. In fact, some studies have succeeded in demonstrating that consumers, guided by their own curiosity during the first phases of the online consumption

process, tend to interact with the website in search of new and interesting elements (To et al. 2007, Webster and Martocchio 1992), something out of the usual (Rohm and Swaminathan 2004). As such, browsing eBay out of curiosity or in search of a bargain, or entering the Kindle eBooks section of Amazon in order to see the latest items published in electronic format could be included within this motivation.

On the other hand, Silvia (2012) notes that curiosity is an intrinsic motivation for the individual, promoting exploration and learning in order to minimize ignorance as a consumer regarding aspects such as product/service category, for example. Consequently, it is reasonable to expect that some consumers, especially those who are interested in particular areas of consumption, are motivated to browse websites whose contents are related to this kind of information.

4.4 Escape

This refers to the interest consumers have in escaping reality (Korgaonkar and Wolin 1999) and in forgetting their worries and daily routine (Babin et al. 1994), accomplished by entering into states of psychological immersion while carrying out online consumption processes (Mathwick and Rigdon 2004). This type of motivation would correspond to the one proposed by Huizinga (2003), who highlighted the importance of the hedonic motivations which lead the consumer to seek out consumption experiences in an attempt to get away from it all. Therefore, some authors consider that consumption can be used as a means of escape, as a way to get out from a low (even depressed) emotional state (Arnold and Reynolds 2003; Avelloa et al. 2010; Babin et al. 1994)

Michon et al. (2007) use this motivation—it is included with this item in their hedonic scale "This shopping trip truly felt like an escape"—among others, in order to explain shopping behavior in physical environments, specifically a shopping mall. In this type of retail store, as in the case of online consumption environments, consumers might regard shopping as a way to escape. In this sense, Babin et al. (1994) point out that consumers who are motivated to escape their day to day and to forget work for a while are motivated to consume not only in physical establishments but also in online establishments.

4.5 Intrinsic Enjoyment

This category relates to the search for those activities which provide enjoyment in and of themselves (Atkinson and Kydd 1997), which, in turn, may orient consumers in their online consumption decisions (Kim et al. 2010). Likewise, it has been observed that this class of motivations may favor repeat visits to the establishment (Ganesh et al. 2007; Kim et al. 2007; Koufaris et al. 2001), the development of favorable attitudes towards online purchasing (Childers et al. 2001;

Li et al. 2001), as well as a greater purchase intent (Childers et al. 2001; Li et al. 2001). Furthermore, it should be considered that online consumers are inclined to use the Internet in search of enjoyment by means of games, online chats, and other forms of entertainment (Stafford and Stafford 2002; Swinyard and Smith 2003); among younger consumers this tendency is more intense (Donthu and García 1999).

4.6 Relaxation

This motivational category comprises the motivations which lead consumers to use online consumption as a means of relief when they are down, as well as to relax and alleviate tension (Arnold and Reynolds 2003; Kim and Hong 2011). Specifically, Jamal et al. (2006, p. 69) define this motivation as "stress relief, to alleviate a negative mood and as a special treat to oneself",

As some studies have highlighted, certain shopping activities can be regarded as "therapeutic" actions which yield hedonic awards by means of self-gratification (Arnold and Reynolds 2003; Babin 1994; Kang and Park-Poaps 2010; Kim 2006; Parsons 2002). On the other hand, Seo and Green (2008) have pointed out that Web browsing contributes to relaxation on the part of the consumers and to their feeling less anxious.

4.7 Hang Out

This type of motivation is defined by the behaviors of consumers who seek to occupy their free time and alleviate boredom by browsing commercial websites and carrying out consumption activities on sites with interesting content (Seo and Green 2008; Papacharissi and Rubin 2000). It is important to consider these aspects of online consumption, as people are increasingly using the Internet to have fun and pass the time, especially when growing bored (Suh et al. 2010). Therefore, this aspect is relatively important to online consumption, as opposed to off-line consumption, precisely because it is carried out by means of the Internet and because the tendency exists among members of society to use it when they have nothing else to do.

Among the activities usually associated with this type of motivation is the downloading of content the consumer finds interesting, such as papers, music or other files (Seo and Green 2008) which allow the consumer to spend his or her free time in an agreeable manner. Furthermore, as Ridings and Gefen point out (2004), hanging out with people is fun and can be done over online brand communities.

4.8 Social Shopping

This category deals with the search for pleasant sensations by carrying out online consumption activities in the company of friends and family, or with people who have common interests. These sought-out benefits allow the person to satisfy the need to socialize and promote the reinforcement of ties with other people (Arnold and Reynolds 2003; Kim 2006). These motivational aspects would contribute to the explanation of the interest online consumers have in sharing information and consumption experiences with other people who share their interests or have aspects in common (To et al. 2007).

However, in spite of the importance attributed to socializing as a motivational factor in consumption processes (Stone 1954; Tauber 1972), some authors have been critical in this respect. For instance, To et al. (2007) consider that the popularity and influence virtual communities have on commercial sites is not sufficiently relevant as to permit an increase in their contacts network and facilitate the socializing of those who participate in such spaces.

In any event, with the growing use of social networks by so many people, their importance in recent years (Jones et al. 2009; Krishnamurthy and Wills 2008; Swaminathan et al. 1999; Wilson et al. 2009), and their influence on brand image and online product consumption, it makes good sense to consider the aspects related to socialization as a dimension of online consumption behavior. In fact, some studies (e.g. Swaminathan et al. 1999) have demonstrated the relevance of online transactions in the "company" of friends, as well as the favorable impact these types of transactions have on consumer satisfaction levels.

4.9 Self-expression

The ninth category contemplated here refers to the motivational aspects related to the consumers' interest in making use of online consumption activities in order to satisfy their needs for self-expression and to exchange impressions and ideas with other people. According to the classic approach of the Theory of Human Motivation, the liberty to express oneself constitutes a previous requisite for the satisfaction of other groups of needs which are higher in the hierarchy (Maslow 1970). Likewise, people adopt behaviors of self-distinction guided by their interest in improving or reviving their self-esteem (Snyder and Fromkin 1977). Driven by their interest in satisfying these needs to stand out and to build up their self-image and social image, consumers undertake activities by which, according to Tian et al. (2001), they acquire, utilize and have products available which allow them to differentiate and distinguish themselves from other people. The final proposition of these behaviors is to develop and improve one's personal and social identity. Therefore, wanting to be different from the rest, and, to that end, making use of consumption behaviors and actions, can be considered to be a way of expressing oneself.

4.10 Role Shopping

This motivational category is associated with the mere pleasure provided by shopping for family, friends and relations. Studies conducted in conventional physical environments, such as the study carried out by Arnold and Reynolds (2003), among others, have highlighted the way in which shopping for others offers intrinsic happiness and lifts the spirits; this is especially true for those consumers who perceive a social function in the carrying out of this class of activities (Tauber 1972). Moreover, some authors consider that shopping for others can be an expression of love (Fischer and Arnold 1990; Otnes and McGrath 2001). Performing the role of shopper can express itself in diverse shopping situations, among which can be included the search for an adequate gift (Arnold and Reynolds 2003; Kim et al. 2010).

While carrying out these searches, the consumer may experience feelings of excitement and happiness, stemming from their interest in finding the perfect gift for family or friends (Arnold and Reynolds 2003; Kim et al. 2010). This motivation for consumption will carry greater weight at moments in which the consumer looks for gifts for loved ones, such as, for example, Christmas or birthdays (Fischer and Arnold 1990).

4.11 Enduring Involvement with a Product/Service

The last dimension to be considered refers to the motivational aspects linked to the interest online consumers have in keeping up to date with the latest trends, styles and innovations in the consumption of particular product or service categories of interest (see Tauber 1972). This leads them to conduct searches on fashions, novelties and innovations (Arnold and Reynolds 2003; Ganesh et al. 2010; Kang and Park-Poaps 2010; Kim 2006; To et al. 2007) and, at the same time, to identify those articles which will best suit them.

The consideration of the motivational aspects related to "enduring involvement" with particular product or service categories, within the contexts of online consumption, raises a certain amount of controversy. On the one hand, it has been pointed out that there are difficulties in online shopping systems being able to satisfy this class of needs, since articles of frequent purchase, which do not tend to be subject to fashions and trends, are so predominant on the Internet (To et al. 2007). However, articles such as that by Parson (2002) have highlighted the importance of satisfying this class of motivations in online consumption. This notion is justified by the instantaneous access the consumer would have to much greater amounts of up to date, global information on trends, fashions and new products and services.

5 Refinement of the Web-based Consumption Motivations by Means of Qualitative Studies

With the aim of evaluating and depurating the utilitarian and hedonic motives of online consumption, obtained after reviewing the literature, two group dynamics (one centered on the group of utilitarian motivations, and another on hedonic motivations) and five in-depth interviews were conducted. These initiatives were recorded, either in audio or video. This was done with the previous consent of the participants.

Seven people participated in each of the focus groups, all of them regular Internet users between the ages of 25 and 45. Previously, steps were taken to ensure that the panel of participants was made up of people of different backgrounds and points of view, as well as distinct levels of experience (though none were null) in the undertaking of online shopping activities. While all the participants in one of the group dynamics had a high level of experience as online consumers, the other group dynamic was composed of 3 participants with a low or moderate level of online consumption experience and 4 participants with a high level of experience. The high level of online consumption experience was determined, according to ideas proposed by Holloway et al. (2005), on the basis of the participant meeting at least three of the following requisites: (a) a minimum purchase frequency of one purchase every 3 months; (b) the previous acquisition of a minimum of four goods or services on the Web; (c) a minimum online purchase of 60 €; and (d) a minimum total online purchase expenditure of 250 €.

The focus groups took shape from a prepared script which was structured in two differentiated and successive parts. The first block, approximately 20 min in length, was focused on encouraging the participants to reflect openly and freely on the motivations in online consumption. The participants were first asked to consider online consumption in its widest sense—not only in the strict sense of online commercial transactions—and they were provided with definitions and illustrations of the types of motivations, utilitarian and hedonic, upon which the dynamic would be centered. The second block (30 min in length, approximately) was dedicated to the generation of information and opinions which would permit the delimitation and description of the spectrum of motivations—utilitarian or hedonic—which represented the study objective of the dynamic. The focus groups not only facilitated a more exact definition of the motivational dimensions which resulted from the review of the literature, they also permitted the re-definition and regrouping of some of these dimensions.

Next, using the qualitative method of the personal interview, this dimensional proposal was submitted to be evaluated by five experts: two e-commerce industry professionals and three marketing scholars with extensive experience in consumer behavior. One of these scholars is a U.S. professor with particular expertise in online shopping motivations.

Table 1 Refinement of the motivations labels after the qualitative studies

Labels based on the literature review	Refined labels
Utilitarian dimensions	
• Desire for control	• Desire for control
• Autonomy	• Autonomy
• Shopping convenience/accessibility/efficiency[a]	• Convenience
• Broad selection and availability/merchandise assortment motive[a]	• Assortment
• Consumption for a better value/economic utility[a]	• Economy
• Availability of information	• Availability of information
• Customized product or service/co-production[a]	• Adaptability/customization
• Order services motives[a]	• Payment services
• Home environment[a]	• –
•Lack of sociability[a]	• Absence of social interaction
•Anonymity	• Anonymity
Hedonic dimensions	
• Visual attraction[a]	• Visual appeal
• Sensation seeking/entertainment	• Sensation seeking/entertainment
• Exploration/curiosity	• Exploration/curiosity
• Escape	• Escape
• Intrinsic enjoyment	• Intrinsic enjoyment
• Relaxation	• Relaxation
• Pass time	• Pass time
• Social shopping[a]	• Socialize
• Self-expression	• Self-expression
• Role shopping	• Role shopping
• Enduring involvement with a product/service	• Enduring involvement with a product/service

[a] Motivational dimension label which has been modified as a result of the qualitative studies

Both the in-depth interviews and the focus groups have facilitated a greater understanding of the phenomenon of consumer online motivations, permitting the delimitation and re-definition of the motivations considered (see Table 1). In this way, some of the motivations previously identified through the review of the literature received new denominations and definitions which were more in line with the results obtained through the qualitative investigation. This was the case for the utilitarian motivations 'shopping convenience/accessibility/efficiency' (which went on to be called 'convenience'), 'broad selection and availability/merchandise assortment motive' (now 'assortment'), 'consumption for a better value/economic utility' ('economy'), 'customized product or service/co-production' ('adaptability/customization'), 'order services motives' ('payment services'), and 'lack of sociability' ('absence of social interaction'). In addition, it was considered necessary to integrate 'home environment' into the motivational dimension 'absence of social interaction'. Regarding the denominations of the hedonic motivations 'visual attraction' and 'social shopping', these were slightly modified to 'visual appeal' and 'socialize', so as to fall more in line with the results of the qualitative studies.

6 Concluding Remarks

In this chapter, and following an extensive review of the literature on consumer motivations and behavior, it proved expedient to consider a wide spectrum of motivational dimensions as internal drivers of the browsing and online shopping processes. This proposal is in line with recent papers which defend the extension of the traditional utilitarian and goal-oriented vision of consumer behavior, also considering hedonist, multisensory and emotional facets (e.g. Seo 2008; Verhagen and Boter 2005).

In this way, based on an extensive review of the literature, an initial and exhaustive proposal has been prepared in order to address consumption motivations on the Web. This proposal, subsequently refined using a qualitative investigation carried out in two phases (consisting of two focus groups and a round of in-depth interviews of experts), constitutes an original contribution to the area of consumer behavior on electronic markets. As opposed to previous studies, which have paid attention to a reduced number of motivational dimensions, usually with a utilitarian bias, here a holistic proposal is offered which considers utilitarian and hedonic aspects jointly. In addition, an exhaustive and complete delimitation of the motivational dimensions within each large category has been performed; in total, 21 dimensions are proposed and structured in two groups, or meta-motivations. Another particular contribution of this paper relates to the proposal of conceptually-new motivational elements, most of which are hedonic in nature (such as visual appeal, exploration or curiosity, involvement with a good/service, and social shopping), for the specific context of online consumption decision processes. These dimensions, at the same time, may contribute to explaining especially relevant experiential aspects in online consumption processes.

We hope that this proposal will be useful for future studies on consumption motivations, in particular those focused on the electronic markets. One of the interesting research opportunities which we are working on has to do with the empirical validation of this theoretical structure and the measurement scales related to each of its dimensions.

Regarding the implications for practitioners, it would be convenient to perform an empirical analysis and validation of the integrative framework proposed here in order to accurately assess the importance of every motivation, whether it is utilitarian or hedonic, for online consumption behaviors. However, a final reflection may be of value here: e-tailers should configure their value offer keeping in mind the multiple and varied motivational facets which condition online consumption (and eventual purchase) processes. Therefore, while it is necessary to equip websites with designs which are functional and easy to use and incorporate tools which make the shopping operation fast, comfortable and efficient (such as intuitive browsers, one click purchases, recommendation agents, etc.), these questions are more closely related to utilitarian aspects of online consumption. Moreover,

they should provide hedonic value, taking special care of the hedonic aspects of the online consumption experiences and keeping in mind those visitors who are eventually immersed in more hedonic-oriented consumption processes.

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The Concept of Flow in Online Consumer Behavior

Irene Esteban-Millat, Francisco J. Martínez-López, David Luna and Inma Rodríguez-Ardura

Abstract The concept of flow has become increasingly relevant in the field of online navigation and specifically in explaining consumer behaviour in electronic markets. Not only can it be used to characterize the user's interactive relationship with virtual environments, but it can also have a positive and desirable impact on the individuals' consumption experiences and also on the performance of the companies' websites which induce flow state in their customers. The purpose of this conceptual article is to analyse in-depth the concept of flow and elucidate its relevance to the context of online consumer behaviour. It contains a comprehensive and critical analysis of the literature and highlights the potential for businesses to generate flow experiences in their online environments. It also identifies the ambiguities and inconsistencies regarding the conceptualisation and operationalisation of flow in online commercial websites. Finally, we stress the importance of conducting further research in this area, with particular focus on the role of flow within the prevailing social web context.

Keywords Flow · E-commerce · Internet · Online consumer behavior

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1 Introduction

As a consequence of the new business opportunities offered by the Internet, academics and practitioners have taken an interest in understanding online consumer and navigation behaviour and identifying the most appropriate organisational strategies. However, although the scientific community has increased its awareness of this phenomenon, there remain many issues that require further research.

In an attempt to understand online consumer behaviour, researchers have often resorted to approximations that are commonly used in the analysis of behaviour in conventional media, but they have also considered new aspects that are largely applicable to virtual environments (Martínez-López et al., 2005). Of particular relevance is the concept of flow for its contribution towards explaining online experiences (Novak et al. 2000), to the extent that it is increasingly used in online consumer behaviour research. The concept of "flow" is used to characterize the user's interactive relationship with virtual media and consequently helps to understand online consumer behaviour. In fact, the literature suggests that facilitating optimal online navigation and shopping experiences, characteristic of a state of flow, can lead to desirable shifts in consumer shopping behaviour (Novak et al. 2003), such as a favourable attitude towards a brand, organisation or website (Dailey 2004; and Jiang and Benbasat 2004, among others), longer visits to a website and a greater likelihood of return visits (Webster et al. 1993; Shih 1998; Koufaris 2002; and Hsu et al. 2012). Several positive effects of flow have also been confirmed, such as online learning and positive subjective experiences. In addition, the literature on online flow suggests that its role in consumer behaviour may become increasingly prominent as the Internet evolves.

This chapter aims to advance in the understanding of the states of flow that emerge in consumption experiences within virtual environments. By means of a review of the literature on online flow experiences, a study is conducted. First of all, the concept of flow is presented, with particular emphasis on its applications to online environments. Then, there is a review of flow studies of online environments and markets. Here, questions such as the aspects or variables related to flow and the methodologies used to study it are presented. The conclusion is that the study of flow in online environments presents major conceptual and methodological ambiguities that need to be analysed carefully in order to broaden our understanding of the subject. Finally, the most important implications of the study of flow in marketing are revealed.

2 Online Consumer Behavior and Flow Experience: A Brief Overview

Consumer behaviour in physical and online environments has much in common (Rodríguez-Ardura and Martínez-López 2008, 2010). However, online behaviour has various characteristics specific to the electronic medium. To analyse such

behaviour, it is therefore advisable to consider not only standard approaches to studying consumer conduct in conventional environments, but also new issues, approaches and concepts which take on relevance in electronic markets; see Richard and Laroche (this handbook) for an overview of the online consumer behaviour framework. In particular, "flow state", or just "flow", is a concept taken from positive psychology and adapted to explain consumer behaviour in electronic markets. It has become increasingly relevant in the field of online consumer behaviour, since the seminal article by the US Professors Donna Hoffman and Tom Novak (1996).

2.1 The Flow Concept

The flow concept was coined by Csikszentmihalyi (1975) in his study on the nature of the behaviour of intrinsically motivated individuals, which paid particular attention to affective behavioural aspects that produce positive emotions, such as interest and enjoyment.

Csikszentmihalyi carried out his work in real situations, studying the activity of people not apparently seeking major extrinsic rewards (such as money or recognition), including athletes, artists, chess players and scientists. He used the term "flow"[1] to refer to autotelic[2] experiences of the kind in question, which are common when an individual is fully involved in and focused on the activity s(h)e is carrying out, in such a way that s(h)e enjoys the activity in itself and loses awareness of any environmental stimulus unrelated to what is being done at that very moment.[3]

According to Csikszentmihalyi (1975, 1990; Csikszentmihalyi and Csikszentmihalyi 1988), flow, in a broad sense, is described as a holistic feeling, an optimal experience that takes place when performing an activity involves a challenge and, at the same time, offers possibilities for action allowing for the use of personal skills, with clear goals and a perceptible response to such actions. Individuals in a flow state feel in control of their environment. They lose their self-awareness and their sense of time becomes distorted as they enter a state of total

[1] The term "flow" was actually mentioned by many of his study's interviewees, who spontaneously used it to explain how they felt during their experiences (Csikszentmihalyi and Csikszentmihalyi 1988). Specifically, Csikszentmihalyi (1975) called such feelings "flow states" or "flow experiences". Later, Csikszentmihalyi and LeFevre (1989) called them "optimal experiences".

[2] The Greek etymology of the term "autotelic" clearly reveals its meaning. Formed by "autos" (self) and "telos" (goal), it is habitually used to denote any type of activity that, in itself, justifies its own end.

[3] The various studies conducted on flow experience have used definitions of the term with essentially convergent meanings, but differ with regard to the elements they class as being involved in the experience (see, among others, Csikszentmihalyi 1977; Day 1981; Csikszentmihalyi and LeFevre 1989; Webster et al. 1993).

involvement, where their ego is immersed in their activity and they ignore other environmental stimuli.

Since it was introduced by Csikszentmihalyi (1975), there have been various attempts to accurately define the flow concept, as well as to determine its main antecedents, dimensions and consequences with regard to an individual's conduct. While descriptive, not predictive, Csikszentmihalyi's writings (Csikszentmihalyi 1975, 1977, 1990, 1997; Csikszentmihalyi and Csikszentmihalyi 1988; Csikszentmihalyi and LeFevre 1989) set the foundations for most subsequent work on flow. They are therefore a fundamental contribution to the study of such experiences and have earned their author the title of "father" of the flow theory.

2.2 Applying Flow on Online Contexts

Following its introduction to the field of psychology by Csikszentmihalyi (1975), the flow concept has spread and been used in other areas of knowledge and different contexts of study. Its most immediate impact was on studies on the psychological and sociological implications of free time (Csikszentmihalyi and LeFevre 1989; Havitz and Mannell 2005), encompassing play, sports and leisure activities, for example. The other contexts of study in which the flow concept has been used most frequently are work (Csikszentmihalyi and LeFevre 1989; Salanova et al. 2006; Bakker 2008) and education (Clarke and Haworth 1994; Rathunde and Csikszentmihalyi 2005; Steele and Fullagar 2009).

Since the 1990s, flow has been used as an element of analysis in the study of individuals' behaviour in other environments, as computer users. In that context, the concept has been examined from the perspectives of human–computer interaction (Trevino and Webster 1992; Ghani 1995; Woszczynski et al. 2002; Pilke 2004), information systems (Chung and Tang 2004; Hsu and Lu 2004; Sánchez-Franco et al. 2007), psychology (Wan and Chiou 2006; Cowley et al. 2008) and consumer behaviour (Novak et al. 2000; Koufaris 2002; Luna et al. 2003; Richard and Chandra 2005; Wu and Chang 2005; Bridges and Florsheim 2008; Guo and Poole 2009; Lee and Chen 2010; Hsu et al. 2012).

Interest in flow is at its greatest in pieces of work that specifically explain online consumer behaviour (Hoffman and Novak 1996; Chen et al. 2000; Novak et al. 2000, 2003; Chen 2006; Bridges and Florsheim 2008; Guo and Poole 2009; Lee and Chen 2010, Hsu et al. 2012, among others). The flow concept has been defined in different ways in that context, although they all express the idea of a user having an optimal experience while carrying out activities online. One of the most widely used descriptions in the literature on online flow is that proposed by Hoffman and Novak (1996): a state that occurs during network navigation and which is characterised by a seamless sequence of responses facilitated by machine interactivity, is intrinsically enjoyable, is accompanied by a loss of self-consciousness and is self-reinforcing. A user in a flow state feels in control of their interaction with the environment. Furthermore, they may temporarily lose their self-awareness and

sense of time, as all their mental energy is focused on their online activity and interaction.

The results of online flow studies suggest that flow experiences have a positive influence on exploratory behaviour and curiosity (Agarwal and Karahanna 2000; Moon and Kim 2001; Huang 2003; Chung and Tan 2004; Pace 2004; Siekpe 2005), learning (Skadberg and Kimmel 2004; Smith and Sivakumar 2004; Rossin et al. 2009) and enjoyment (Sharafi et al. 2006), among other things. Verification of those positive consequences of flow has led to the concept acquiring increasing relevance in research into online consumer behaviour (Hoffman and Novak 1996; Novak et al. 2000, 2003; Koufaris 2002; Luna et al. 2003; Dailey 2004; Smith and Sivakumar 2004; Richard and Chandra 2005; Sicilia et al. 2005; Siekpe 2005; Wu and Chang 2005; Bridges and Florsheim 2008; Guo and Poole 2009; Lee and Chen 2010; Hsu et al. 2012). Nonetheless, while progress has been made in the field, there is still a long way to go to gain an in-depth knowledge of the nature of flow and discover why certain situations are more conducive than others to the state. With a view to shedding light on such matters, research into online flow focuses particular attention on studying the motivational elements of the experience which affect its formation and development. To that end, such research takes into account not only elements corresponding to intrinsic motivation, as is becoming routine in work on flow in physical environments, but also those corresponding to extrinsic motivation.

The emphasis placed on studying intrinsic and extrinsic motivation is justified on the basis of the fundamental role that motivation plays in many theories (arising from disciplines as varied as biology, psychology and marketing) geared to explaining individuals' behaviour. Motivation has also featured prominently in the consumer behaviour discipline in particular (Martínez-López et al. 2006, and this handbook), and has been included, explicitly or implicitly, as a variable in most general models of such behaviour (Nicosia 1966; Howard and Sheth 1969; Engel et al. 1968; Bettman 1979; Howard 1989).

Flow studies commonly analyse the motives that lead an individual to act in a certain way (Koufaris 2002; Novak et al. 2003; Bakker 2008; among others). Flow was initially associated with activities undertaken for the sake of enjoyment and entertainment, without the aim of achieving a particular goal, which are reason in themselves for carrying them out; activities, in short, that are intrinsically motivated. Nowadays, there is the view that both types of motivation could feature in a single navigation process (Novak et al. 2003; Sánchez-Franco et al. 2007). It would thus be possible for an individual to alternate between intrinsic and extrinsic motivation in the same flow experience (see Martínez-López et al. 2006).

Be it intrinsic or extrinsic, motivation is regarded as a trigger for online flow, and is usually gauged on the basis of other concepts to which it is related, such as involvement or importance and perceived usefulness. In such cases, high levels of the aforementioned concepts are assumed to correspond to extrinsic motivation, although low levels are not necessarily associated with intrinsic motivation. Along similar lines, intrinsic motivation is often analysed on the basis of concepts such as perceived playfulness, perceived enjoyment and curiosity or exploratory behaviour.

Despite the major bearing motivational aspects have on flow experiences, it is also necessary to take factors of a different nature into account. Analysing them all in combination is the way to learn more about the phenomenon and obtain a better understanding of consumers' experiences as online users.

3 Flow Studies in Online Environments

Most of the studies on online flow carried out in different disciplines take the same variables into account for model development purposes, and use the same measurement methods. Consequently, to learn more about online consumer behaviour on the basis of flow, researchers tend to draw on empirical studies undertaken in other fields. The fact that little work has been carried out on online flow in the consumer behaviour field itself, despite the study of the phenomenon in virtual environments having attracted increasing attention, is a further factor in the practice in question.

3.1 Variables Related to Flow

The flow variables habitually used in research into online flow, and which have been taken into consideration in theory development and empirically tested models alike, are: balance between challenges and skills; perception of control; focus attention or concentration; time distortion; interactivity; telepresence; learning; perceived playfulness; perceived enjoyment; curiosity; involvement; and perceived usefulness. It should be noted, however, that any given piece of research is likely to feature only a selection of the variables in question.

3.1.1 Balance Between Challenges and Skills

The product of combining the concept of challenges and that of skills, balance between the two, is introduced in the first definitions of flow proposed by Csikszentmihalyi (1975, 1977). Challenges occur when an individual finds an activity sufficiently testing and it thus constitutes a stimulus. Skills refer to the individual's perception of their personal ability to adequately meet or take advantage of challenges. The congruence between the two concepts reflects the relationship between the challenges the individual perceives when carrying out an activity and their perception of their skills. Balance is attained when the level of the challenges and that of the skills they perceive are equally high or low.

Although research into conduct has usually dealt with the two elements in question separately, some flow studies show that satisfactory experiences arise when the skill level and the challenge level are simultaneously high

(Csikszentmihalyi 1997; Ghani 1995). Online flow studies tend to analyse the relationship between challenges and skills by considering the two concepts separately.

Balance between challenges and skills is an essential requisite for a flow experience to take place (Csikszentmihalyi 1975, 1977, 1990; Ghani 1991; Trevino and Webster 1992; Clarke and Haworth 1994; Ghani 1995; Hoffman and Novak 1996; Chen et al. 2000; Novak et al. 2000; Rettie 2001; Koufaris 2002; Pilke 2004; Shoham 2004; Sweetser and Wyeth 2005; Chen 2006, 2007; Guo and Poole 2009). Additionally, a flow state is attained when, as well as being balanced, challenges and skills exceed the level routinely encountered in everyday experiences. Thus, for an individual to remain in flow, they must face more complex challenges as their skills increase.

In a virtual environment, perceived challenges are linked to the opportunities for action with which a user is presented in the medium, while perceived skills are related to the ability to overcome such challenges (Hoffman and Novak 1996). Balance between challenges and skills above a critical threshold is a fundamental factor in online flow experiences too.

3.1.2 Perception of Control

Control over an individual's behaviour and environment is a variable that often features in attitude-based models of consumer behaviour (Schifter and Ajzen 1985; Bagozzi and Warshaw 1990; Ajzen 1991), as well as in innovation adoption theories (Davis 1989; Davis et al. 1989; Taylor and Todd 1995). It is used with the aim of taking account of the effect of restrictions to which an individual's conduct is usually subject and which partially or completely inhibit their behaviour.

Control or perception of control is a recurring variable in flow studies (Csikszentmihalyi 1977; Delle Fave and Massimini 1988; Ghani 1991; Novak et al. 2000; Koufaris 2002; Hsu and Lu 2004; Pace 2004; Jiang and Benbasat 2005; Sharafi et al. 2006; Inal and Cagiltay 2007; Bridges and Florsheim 2008; Chang and Wang 2008; Guo and Poole 2009). In that context, it is usually described as a feeling that arises when an individual perceives that they are in control of their own actions and their interaction with the environment in which they are operating (Koufaris 2002). The individual feels that their skills are suited to the medium and that the medium responds to their actions.

In an online environment, the perception of control over the medium helps to explain individual's flow experiences. There are a number of studies of optimal Internet browsing experiences (Hoffman and Novak 1996; Chen et al. 2000; Koufaris 2002; Jiang and Benbasat 2005; Huang 2006; Bridges and Florsheim 2008; Chang and Wang 2008; Guo and Poole 2009) which point to the relationship between perception of control and flow in the medium. In an online context, a user can control not only their own actions but also their interaction with the environment, either by advancing and exploring the content presented to them or by withdrawing from the environment.

3.1.3 Focus Attention or Concentration

Regarded as a mental process whereby an individual centres their perception on a certain stimulus, attention is one of the subjects that have generated most interest among researchers in the field of psychology in general and that of cognitive neuroscience in particular. Attention is also an important concept in the consumer behaviour discipline and has featured as a variable in some of its general behavioural models (Bettman 1979; Engel et al. 1968; Howard and Sheth 1969).

Focus attention or concentration is a type of attention voluntarily directed at a specific task or environmental stimulus, and which, when maintained for a certain period of time, enables an individual to concentrate on the activity they are carrying out. It is associated with resistance to distraction and the ability to distinguish between relevant and irrelevant information.

Focus attention is one of the most widely used variables in flow studies. Several pieces of research suggest a relationship between flow experiences and focus attention or concentration (Csikszentmihalyi 1975, 1990; Chen et al. 2000; Novak et al. 2000; Chou and Ting 2003; Luna et al. 2003; Pilke 2004; Jiang and Benbasat 2005; Sánchez-Franco 2005; Chen 2007; Inal and Cagiltay 2007; Bakker 2008; Chang and Wang 2008; Guo and Poole 2009; Lee and Chen 2010; Martínez-López et al. 2010, 2011).

For an individual to enter a flow state, they have to devote all their attention to an environment generating stimuli. Focus attention requires complete dedication to and concentration on the activity being carried out, resulting in the individual becoming absorbed in the activity and experiencing an intense feeling. With their attention fully centred on interaction with the medium, they cease to consider irrelevant thoughts and perceptions, and their concerns vanish (Csikszentmihalyi 1975). The same thing happens when browsing the Internet, in which case the computer screen is the user's stimulus field (Novak et al. 2000). The individual perceives the physical world disappearing and they become absorbed in the activity they are performing, losing awareness of any aspect unrelated thereto.

3.1.4 Time Distortion

Time distortion refers to the phenomenon of an individual losing their sense of time, which they perceive as passing at an unnatural rate. As Ornstein (1977) states, time usually seems to go by faster during positive experiences than during negative experiences.

Time distortion has been studied in a number of disciplines. They notably include cognitive psychology, from the perspective of which attempts have been made to explain the concept in relation to the influence of factors such as pleasure, volume of activity and urgency. Accordingly, it has been suggested that people tend to feel that time passes more quickly when they are carrying out an activity that they find pleasant and which occupies them, as well as when they are in a hurry.

Considerable attention has been devoted to time distortion in flow studies, as it is a fundamental variable for explaining such experiences (Chen et al. 2000; Novak et al. 2000; Chou and Ting 2003; Pace 2004; Skadberg and Kimmel 2004; Chen 2007; Bridges and Florsheim 2008; Cowley et al. 2008; Guo and Poole 2009; Lee and Chen 2010; Srivastava et al. 2010). When an individual is deeply involved in an activity, as is the case when they are in a flow state, time no longer matters to them. Their sense of time alters and distorts, losing consistency with the time that actually elapses.

A user who enters flow in a computer-mediated environment experiences the same feeling, losing their notion of the time they spend exposed to the medium. According to Sánchez-Franco (2005), the use of technology and the user's deep involvement in and full focus on the virtual environment result in a feeling of being transported through time and space. The user's perception is that time passes very quickly, and they are surprised at how fast it goes by.

3.1.5 Interactivity

Interactivity is an attribute that characterises the Internet and distinguishes it from conventional media. In the broadest sense, interactivity refers to exchanges between people, or between people and technology, and usually results in a change in the behaviour or knowledge of at least one of them. Nonetheless, there is considerable disagreement among researchers on the term's conceptual boundaries, mainly due to its complex nature. Interactivity has consequently been analysed, from different perspectives, as a communication process, a characteristic of the medium, an individual trait and a psychological state, among other things. In any case, online flow studies tend to regard interactivity as a medium property on the basis of which a user engages with the system reciprocally, in such a way that the latter immediately responds to the actions of the former. It is also thought that users often perceive a certain level of interactivity when navigating online.

The degree of interactivity is determined by a combination of various elements. While there are a number of classifications of such elements in the literature (Steuer 1992; Laurel 1990; Wu 2000; Coyle and Thorson 2001), that in which Hoffman and Novak (1996) identify speed, range, mapping and ease of use is particularly notable. Speed depends on several factors, such as the type of Internet connection involved and a user's hardware and software. Range refers to the number of possible actions available to a user in an environment, while mapping is related to the perceived naturalness and intuitiveness of interaction. Lastly, ease of use is a person's perception that using a given system is effortless (Davis 1989).

Interactivity has been taken into consideration in various studies of online flow (Novak et al. 2000; Luna et al. 2003; Richard and Chandra 2005; Wu and Chang 2005; Bridges and Florsheim 2008; Chang and Wang 2008) with a view to improving explanations of the optimal experiences that take place during a user's interaction with the medium. Specifically, the literature suggests that, as a perceived characteristic of the medium, interactivity directly influences flow.

3.1.6 Telepresence

Telepresence, a characteristic inherent to virtual environments, is related to a user's feeling of being present in the medium in which they are interacting (Held and Durlach 1992; Steuer 1992; Chen et al. 2000). When the user experiences telepresence, they focus their full attention on the virtual environment, which can even appear more real to them than their actual physical environment.

The level of telepresence a user experiences is determined by three elements, namely vividness, interactivity and the number of participants in the medium. According to Hoffman and Novak (1996), vividness refers to the amount of sensory information available in the medium and depends, in turn, on the breadth and depth of the information transferred. The breadth of information is related to the sensory aspects involved, and is closely connected to the medium's simultaneity and richness. The more sensory dimensions transmitted in an environment, the greater its breadth. Depth, meanwhile, is linked to information accuracy and quality levels.

Interactivity influences telepresence through the ease of use of the medium, data organisation and navigation speed.[4] The feeling of telepresence also depends on the number of individuals active in an environment. The more users there are interacting in a medium (with it and through it), the greater the likelihood of experiencing telepresence (Shih 1998).

Telepresence has been included in various online flow studies (Hoffman and Novak 1996; Chen et al. 2000; Novak et al. 2000; Chou and Ting 2003; Pace 2004; Skadberg and Kimmel 2004; Bridges and Florsheim 2008; Lee and Chen 2010), as it has been verified that such feelings are conducive to a user entering a flow state.

3.1.7 Learning

Learning, as a factor that conditions human conduct, has been studied from a range of angles, notable among which, due to their wide acceptance, are behaviourism and cognition. Various pieces of research carried out in the psychology and marketing fields clearly show the importance of studying this variable due to its influence on an individual's behaviour, in that people tend to orientate their conduct towards obtaining information.

The literature on flow identifies a relationship between the phenomenon and greater information retention and effectiveness in communication (Hoffman and Novak 1996; Pace 2004; Sicilia et al. 2005). Additionally, a number of studies recognise flow's influence on learning in environments of different kinds (Csikszentmihalyi and LeFevre 1989; Ghani 1991; Hoffman and Novak 1996; Skadberg and Kimmel 2004). For example, it has been demonstrated that flow has

[4] An analysis of interactivity as a flow-related element appears in the previous section of this chapter.

a bearing on the way students learn in certain educational contexts (Rathunde 2003; Shernoff et al. 2003; Ghani 1995; among others), and that users who experience online flow are more likely to assimilate website content (Skadberg and Kimmel 2004). In the context in question, flow usually occurs when an activity challenges an individual sufficiently to develop their skills to the greatest extent possible. Additionally, as the level of their skills increases, the challenges they face must become more demanding in order for them to remain in a flow state.

3.1.8 Perceived Playfulness

The concept of perceived playfulness is widely used to gauge an individual's intrinsic motivation (Moon and Kim 2001; Chen et al. 2002; Chung and Tan 2004). An intrinsically motivated person is considered to act for the entertainment that doing so entails, rather than in expectation of rewards or personal benefits (Ryan and Deci 2000).

Perceived playfulness has been used for the purpose of measuring intrinsic motivation in research into ITC adoption (Davis et al. 1992; Agarwal and Karahanna 2000; Yu et al. 2005), as it significantly conditions the use of a given system (Davis et al. 1992; Moon and Kim 2001; Chen et al. 2002). In that regard, perceived playfulness has a proven influence on the use of personal computers, certain business applications and the Internet in general, among other things.

Playfulness has also been included in studies of flow (Novak et al. 2000; Moon and Kim 2001; Woszczynski et al. 2002; Chou and Ting 2003; Chung and Tan 2004; Mathwick and Rigdon 2004) as an explanatory variable of such experiences.[5] The concept of playfulness is actually implicit in the very definition of flow, which is habitually described as an extremely enjoyable optimal experience.

When an individual experiences online flow, they focus their attention on the interactive process, become curious and perceive it as something intrinsically pleasant and entertaining. The more entertaining individuals find interaction, the more positive their perception of it is and, consequently, the more willing they are to interact in the future.

3.1.9 Perceived Enjoyment

As in the case of playfulness, perceived enjoyment is often used as a means of gauging intrinsic motivation in research into human conduct (Trevino and Webster 1992; Ghani and Deshpande 1994; Igbaria et al. 1994; Sánchez-Franco and Roldán 2005). The attention paid to the concept in the area of ICT use and acceptance

[5] There are two types of approach to studying playfulness. In the first, it is viewed as a personal trait, and thus represents an enduring personal distinction. In the second, it is viewed as a situational state resulting from a subjective experience that takes place during interaction with a medium. The latter approach is more common in flow studies.

(Davis et al. 1992; Venkatesh et al. 2002; Van der Heijden 2004) is particularly notable. ICT use has been found to be conditioned by the user's perception of enjoyment, i.e. the extent to which the actual process of using such technology is deemed enjoyable in its own right rather than on the basis of its possible consequences.

The concept of perceived enjoyment[6] (Ghani 1995; Agarwal and Karahanna 2000; Novak et al. 2000; Mathwick and Rigdon 2004; Pace 2004; Skadberg and Kimmel 2004; Huang 2006; Chang and Wang 2008; Lee and Chen 2010) is also widely used in flow studies. The first definition of flow proposed by Csikszentmihalyi (1975) actually specifies that the experience is extremely enjoyable.

Most of an individual's day-to-day activities are exoteric, and are thus undertaken for specific, pre-established purposes rather than simply for the pleasure of performing them. In a flow state, however, the individual engages in interaction not only to achieve something but also due to the gratification or pleasure arising from the very activity they are carrying out. Perceived enjoyment thus plays a relevant role in flow, giving it the hedonistic aspect characteristic of such experiences.

As Hoffman and Novak (1996) state, high levels of enjoyment and involvement during interaction with a computer entail subjective perceptions of happiness in an individual. In that context, online flow facilitates such subjective experiences (Novak et al. 2000; Skadberg and Kimmel 2004; Wu and Chang 2005; Huang 2006), as it emphasises perceived enjoyment where interaction with technology is concerned and generates a gratifying mental state, which contributes to improving the individual's psychological wellbeing. Users browsing the Internet may thus enjoy interacting with the medium and its content due to their intrinsic interest in carrying out the activity and the satisfaction that doing so leads them to experience.

3.1.10 Curiosity

Sensory and cognitive curiosity or exploratory behaviour is another means of gauging underlying intrinsic motivation in an individual's conduct, and is determined by novelty, complexity and unpredictability (Reeve 1994). According to Hoffman and Novak (1996), it reflects an individual's desire to explore the various options and opportunities available to them in the environment in which they are acting.

Curiosity is also linked to an individual's tendency to innovate, which, in turn, is related to their attitude towards innovations and interest in interacting with technology. It has been suggested that the use of new technologies causes

[6] Some studies regard perceived enjoyment as a dimension of perceived playfulness (see Moon and Kim 2001).

individuals with a tendency to innovate to experience high levels of intrinsic stimulation and a desire to enjoy them, a situation conducive to flow (Sánchez-Franco and Roldán 2005).

Exploratory behaviour is also habitually associated with playful actions, i.e. with an individual's tendency to spontaneously interact with technology. The term "play" has been used to describe computer use characterised by deep involvement, enjoyment and engagement in trial-and-error behaviour. In the literature on online flow, individuals with the quality in question are considered to have a greater aptitude for flow experiences (Sánchez-Franco and Roldán 2005).

In a flow state, individuals experiment with the medium in which they are acting, leading to the assumption that they are engaging in exploratory behaviour. It has been suggested that there is actually a direct relationship between flow and curiosity or exploratory behaviour (Trevino and Webster 1992; Webster et al. 1993; Ghani and Deshpande 1994; Agarwal and Karahanna 2000; Novak et al. 2000; Moon and Kim 2001; Chou and Ting 2003; Chung and Tan 2004; Pace 2004; Siekpe 2005; Huang 2006; Sharafi et al. 2006).[7]

3.1.11 Involvement

Involvement is an object of study in various disciplines, including psychology and marketing, although that has not prevented consensus being reached on the concept. Involvement is described as a subjective psychological state that reflects an individual's perception of the importance and interest a given object or event holds for them personally (Barki and Hartwick 1989). Additionally, the motives that move individuals to act are implicit in the concept. It is thus possible to determine the type of motivation underlying a person's behaviour on the basis of involvement.

In the study of involvement, one of the most widely accepted and used classifications is that which distinguishes between enduring and situational involvement (Laurent and Kapferer 1985; Celsi and Olson 1988). The difference between the two lies in the source of importance and interest. Involvement is deemed enduring if the importance and interest attributed to a certain object or event stem from the consumer, and situational if that importance and interest depend on a specific circumstance. Enduring involvement is usually associated with intrinsic motivation, and situational involvement with extrinsic motivation.

In the context of computer-mediated environments, an individual's involvement with the Internet refers to the extent to which they find navigation relevant and feel highly motivated to carry out the task on which they are working in the medium (Sánchez-Franco and Roldán 2005).

[7] Nonetheless, Novak et al. (2000) indicate that further research would be advisable to obtain conclusive data on the relationship between flow and exploratory behaviour.

Verification that users who experience flow are involved in their online activity, becoming deeply committed to and absorbed by it, has prompted various pieces of research to use involvement to explain the flow phenomenon (Hoffman and Novak 1996; Novak et al. 2000; Hsu and Lu 2004).

3.1.12 Perceived Usefulness

Perceived usefulness has been described as the degree to which an individual believes that using a particular system improves their personal performance (Davis 1989). Based on that definition, a website's usefulness depends on it enabling users to easily and conveniently fulfil certain goals other than simply carrying out an activity for its own sake. The variable in question therefore helps to explain the underlying extrinsic motives in the behaviour of an individual who accepts and interacts with technology.

Perceived usefulness is a key concept in the study of the adoption of (predominantly technological) innovations. It is regarded as a crucial variable in terms of explaining information system use and acceptance (Davis 1989; Igbaria et al. 1995; Venkatesh and Davis 2000; Koufaris 2002; Venkatesh et al. 2003; Hsu and Lu 2004; Chang and Wang 2008).

In online flow studies, perceived usefulness has sometimes been used to indirectly analyse an individual's extrinsic motivation in the medium (Koufaris 2002; Chung and Tan 2004; Sánchez-Franco and Roldán 2005; Sánchez-Franco et al. 2007; Chang and Wang 2008). In that context, and as in the case of involvement, the perception that an environment is highly useful is associated with extrinsic motivation. A low level of perceived usefulness is not always associated with intrinsic motivation, however.

3.2 Dimensionality of Flow

The complex nature of the flow concept, the lack of consensus regarding its precise definition and the particular characteristics of the virtual environment in which such experiences may take place make studying flow difficult, not only in terms of its conceptualisation and measurement, but also of the analysis of the elements related to it. Despite the effort devoted to studying online flow in recent years, with a view to better understanding consumption and navigation experiences, there are discrepancies and inconsistencies in the literature.

Firstly, there is no consensus on the identification of the variables related to flow. That is reflected in the variety of factors taken into consideration in each study, the different semantic content sometimes assigned to the same term, and the use of elements with partially overlapping meanings in a single piece of work. Secondly, there also appears to be a lack of consensus on the interactions that take place between flow-related variables. Furthermore, while certain flow models, such as that developed by Novak et al. (2000), are notable for their exhaustiveness

and significance, to explain some of the interactions in question it seems necessary to study the aforementioned variables in greater detail so as to detect the causal relationship between them, as well as to identify new relationships. Thirdly, a flow-related variable may feature in various empirical studies but not always be placed in the same position in the flow models designed. It may even be the case that the same element is varyingly classed as an antecedent of flow, a dimension of the flow experience and a consequence of the phenomenon. That applies, for instance, to perception of control, which has been deemed an antecedent (Novak et al. 2000), a dimension (Agarwal and Karahanna 2000) and a consequence (Hoffman and Novak 1996) of flow.

The discrepancy in opinions on the last point raised is partly due to researchers' different stances on the flow concept. On one hand, some of them view flow as a unidimensional concept (Novak et al. 2000, 2003; Luna et al. 2003; Mathwick and Rigdon 2004; Richard and Chandra 2005; Bridges and Florsheim 2008) and assume that any flow-related element is an antecedent or a consequence of the phenomenon. On the other hand, some researchers regard flow as multidimensional (Nel et al. 1999; Chen et al. 1999, 2000; Moon and Kim 2001; Chou and Ting 2003; Hsu and Lu 2004; Chen 2006; Huang 2006; Sharafi et al. 2006; Wan and Chiou 2006; Guo and Poole 2009; Liu and Liu 2009; Lee and Chen 2010; Srivastava et al. 2010) and assume that, regardless of the antecedents and consequences that may exist, there may also be elements that are part of flow itself and can be considered dimensions of the concept.

The existence of two different perspectives on the dimensionality of flow entails different approaches to measuring the phenomenon. The researchers who view flow as unidimensional usually include a single question on its existence in their questionnaires. That question tends to be preceded by descriptive examples of flow, as experienced by certain people, underlain by the definition of flow. In such cases, after carefully reading the examples, interviewees state whether or not they have ever experienced flow and provide information on other aspects supposedly related to the phenomenon. The use of similar descriptions of flow in different pieces of research makes it possible to compare the results obtained, provided that the interviewees answer the question on whether they have experienced flow affirmatively.

The researchers who view flow as multidimensional do not usually ask interviewees about the existence of flow directly. The presence of flow is assumed in such cases, so questionnaires include questions on aspects related to the phenomenon. Taking this approach makes comparing the results obtained difficult, however.

3.3 Online Flow Studies

Ever since the Internet's emergence, there has been a constant increase in online flow studies in different disciplines, with researchers taking varying approaches depending on their object of study. Some pieces of research draw on the flow

concept to explain specific user behaviour online, some analyse particular aspects of user navigation (such as online orientation, activities and websites), and others use flow to explain other constructs and to improve explanations corresponding to classic theories and models.

A selection of the most relevant studies of online flow, based on an extensive review of the literature on the subject, is presented in Appendix. The variables associated with flow in each study are identified, distinguishing between antecedents, dimensions and consequences of the phenomenon. In the case of studies that do not lend themselves to such a distinction, the flow variables identified are classed as dimensions.[8] The object of study and the scope of each piece of research are also indicated.

The table in the appendix not only features the main flow studies carried out from the perspective of online consumer behaviour (Hoffman and Novak 1996; Novak et al. 2000; Koufaris 2002; Sénécal et al. 2002; Korzaan 2003; Luna et al. 2003; Novak et al. 2003; Dailey 2004; Mathwick and Rigdon 2004; Smith and Sivakumar 2004; Shoham 2004; Jiang and Benbasat 2005; Richard and Chandra 2005; Sánchez-Franco 2005; Sicilia et al. 2005; Siekpe 2005; Wu and Chang 2005; Huang 2006; Bridges and Florsheim 2008; Guo and Poole 2009; Lee and Chen 2010; Srivastava et al. 2010; Hsu et al. 2012), but also identifies those undertaken in other fields. Studies of the latter kind are included because, as mentioned previously, researchers looking to broaden knowledge of flow's role in online consumer behaviour usually also draw on studies carried out in other disciplines.

4 Conclusions

Since the flow concept was shown to be suitable for defining the nature of consumers' experiences as users in online environments, it has been increasingly frequently used as an element of analysis in research geared to learning more about online consumer behaviour. It has been suggested that if a commercial website is to be successful, it must provide consumers with "flow opportunities", i.e. optimal browsing experiences. Involvement in an enjoyable exploratory experience is motivating in its own right and generates feelings of satisfaction in individuals, who find repetition of the same behaviour entertaining. Providing optimal browsing and online consumption experiences characteristic of a flow state can have desirable results for online establishments where consumer behaviour is concerned (Novak et al. 2003). Firstly, such results generate a positive attitude towards brands, organisations or websites (Dailey 2004; Jiang and Benbasat 2005; among others). Additionally, flow experiences are conducive to behaviour that has the effect of making a consumer's visit to a website last longer (Hoffman and

[8] Only flow variables validated in the corresponding model have been taken into account where the empirical studies presented in the table are concerned.

Novak 1996; Nel et al. 1999) or more likely to be repeated (Hoffman and Novak 1996; Nel et al. 1999; Koufaris 2002; Luna et al. 2003; Sánchez-Franco 2005; Hsu et al. 2012).

The implications arising from the study of the consequences of flow are clear, significant and promising. It is hoped that understanding the phenomenon will pave the way for the development of websites that enable users to experience flow.

Online flow studies are currently affected by substantial conceptual and methodological ambiguities that require careful analysis in order to further knowledge in the field. First and foremost, there is a clear lack of consensus on the identification of flow-related variables and the way they interact with each other; i.e., a given variable may be classed as an antecedent of flow, a dimension of the experience or a consequence of the phenomenon, depending on the piece of research consulted. Additionally, there are two different stances on the dimensionality of flow. The first regards flow as a unidimensional concept and deems any aspect or variable related to it an antecedent or a consequence thereof. The second regards flow as multidimensional and is based on the understanding that, regardless of the antecedents and consequences that may be associated with flow states, there are aspects that are part of flow and should be treated as components of the concept's dimensional structure. While the two approaches to studying flow are not contradictory, they entail different ways of measuring the phenomenon. In any case, it is very important to take the dimensionality of flow into account when comparing the results of different studies.

With a view to reducing the aforementioned ambiguities, some researchers have suggested studying flow in specific fields or environments, as most of the research carried out to date has analysed the phenomenon of online flow on the basis of the entire consumer browsing experience. There have been calls for the development of models of the flow phenomenon in different online environments, encompassing the main variables related to it in each context. It has also been suggested that it is necessary to continue analysing users' flow experiences during certain activities in electronic environments, rather than looking at their general behaviour on the basis of all the activities they carry out.

5 Final Remarks for Practitioners

The results of online flow research confirm that facilitating optimal online navigation and shopping experiences, characteristic of a state of flow, can have a positive and desirable impact (e.g., leading to exploratory behaviour or curiosity, perceived control, learning and positive affectivity) not only for consumers but also for the companies that make them possible (e.g., such as a favourable attitude towards the brand, the organisation and the website, longer website visits, more return visits, and purchase intention). This is because the involvement of consumers when in a state of flow is motivating in itself, as it provides feelings of satisfaction and enables them to enjoy the activities they are performing. When

individuals enjoy their navigation and shopping experiences, they usually become more deeply involved in them and form a higher opinion of the products or services that are presented to them online. This ultimately improves their attitudes and future intention to purchase a company's goods. Therefore, the design of web environments should not serve purely commercial criteria, but also care about providing an online shopping environment that induces flow.

The literature on online flow also suggests that the role of flow in consumer behaviour may become increasingly important as the Internet evolves, its greatest impact being in web 2.0 or social web environments. In this context, in which networks, technologies and systems converge in a more dynamic, participative and collaborative fashion, flow state is set to increase both the consumers' engagement with companies on the websites and their online experiences. This is because some of the variables that are linked to flow (e.g., perceived control, interactivity and curiosity) may encourage consumers to use social web-based applications which are available on certain company's websites (e.g., links to social networks such as Facebook or Twitter to do a "like" or post a "tweet", accessing podcasts and videocasts, posting comments, etc.). However, it is worth highlighting the absence of studies examining the role of flow in aspects of consumer behaviour in social web-based commercial environments,

In any case, several strategies or specific actions have been identified that companies operating in electronic markets can implement to promote the onset or longer duration of flow experiences. First, as pointed out by Hoffman and Novak, it is necessary to consider the importance of a well designed user interface for achieving an appropriate balance between the user's skills and the challenges posed by the activity. Several factors such as hardware, software and hypermedia content, among others, are essential to facilitating telepresence and interactivity. Thus, web environments should provide tools that encourage the user to explore and have fun while browsing. Among others, consumer participation should be encouraged by enabling users to modify the form and content made available to them in a simple and agile manner. To do so, companies should provide multiple possibilities of action, minimise online waiting times and ensure that the navigation or shopping experience is not interrupted, while guaranteeing consumers easy functioning of all online resources and suitable information for their purposes.

The type of behaviour that the consumer is expected to adopt (such as purchasing a product, obtaining information or recognising a brand) should also be taken into account. Hence, one of the challenges for companies is to suitably delimite the specific objectives to be achieved through their websites and online strategies, but avoiding the trap of trying to provide "everything for everyone".

It is also desirable to ensure that consumers feel capable of controlling their actions and interactions in the virtual environment. Thus, they should be provided with the resources needed to control the navigation experience, explore content gradually and develop activities at their own pace. This perceived control will help them to focus on the tasks being performed in the online environment (e.g., a company's website). In this respect, it is interesting to develop online websites that

allow consumers to adapt their navigation and shopping process to their specific needs.

In sum, the positive effects produced by experiencing flow in online consumption should encourage companies to develop websites that foster this mental state in their customers. Here also, it is necessary to consider the vast amount of consumers worldwide that increasingly access commercial websites through mobile devices. Companies cannot ignore the particularities of these devices, as opposed to PC usage in wired e-commerce, and automatically adapt their website designs in a way that allows consumers to get in flow when conducting mobile commerce too. On the other hand, more research is needed to accurately analyse within the mobile commerce context those conclusions on online consumer behaviour from the flow studies on wired e-commerce. At any rate, customers in flow are expected to have greater consumption experiences, which in turn amplify the perceived value of these experiences. Hence, the ability of a company to set its online customers in flow should strength its competitive position on the web, in particular compared to those companies which do not do so.

A.1 6 Appendix. A Selection of the Main Articles on Online Flow

Author/s and year	Antecedents of flow	Flow experience	Consequences of flow	Object of study	Scope of analysis
Hoffman and Novak (1996)	• Challenges • Skills • Focus attention • Involvement • Interactivity • Vividness • Telepresence		• Perception of control • Increased learning • Exploratory attitude • Positive subjective experience	Flow experience in the online consumer	Web users (conceptual model)
Chan and Repman (1999)		• Challenges/skills • Clear goals • Feedback • Concentration • Control • Merging of action and awareness • Loss of self-consciousness • Time distortion • Autotelic experience		Flow experience in online learning activities	17 graduate students from an introduction to the internet course
Chen et al. (1999)	• Challenges/skills • Immediate feedback • Clear goals	• Concentration • Control • Merging of action and awareness	• Loss of self-consciousness • Time distortion • Autotelic experience	User's flow experience during Web activities	304 web users
Nel et al. (1999)		• Control • Focus attention • Curiosity • Intrinsic interest		Flow experience in navigation behaviour across different websites	33 university students who are internet users
Agarwal and Karahanna (2000)	• Fun • Personal innovation	• Temporary dissociation • Focused immersion • Enjoyment • Control • Curiosity	• Perceived usefulness • Perceived ease of use	Cognitive absorption in the use of technology	288 university students who are internet users
Chen et al. (2000)	• Potential control • Merging of action and awareness	• Concentration • Loss of self-consciousness • Time distortion • Telepresence	• Autotelic experience • Positive affects	User's flow experience during Web activities	304 web users

(continued)

(continued)

Author/s and year	Antecedents of flow	Flow experience	Consequences of flow	Object of study	Scope of analysis
Novak et al. (2000)	• Challenges • Skills •Focus attention • Importance • Interactivity (speed) • Time distortion • Stimulation • Telepresence • Control		• Exploratory behaviour	Flow experience in the online consumer	1,654 web users
Moon and Kim (2001)	• Ease of use	• Enjoyment • Concentration • Curiosity	• Attitude toward use • Intention of use • Use	User's flow experience in the acceptance and use of the web	152 graduate students who are web users
Rettie (2001)	• Clear goals • Immediate feedback • Challenges/skills	• Concentration • Potential control • Time distortion • Enjoyment		Flow experiences on the internet	32 internet users
Koufaris (2002)	• Product involvement • Skills • Search mechanisms • Challenges	• Perception of control • Enjoyment in buying • Concentration	• Intention to repeat	Flow experience in the acceptance and use of the Web and in consumer behaviour	280 web consumers
Sénécal et al. (2002)		• Enjoyment • Concentration • Control • Challenges		Flow experience in hedonic and utilitarian shopping values	105 undergraduate students
Chou and Ting (2003)	• Repetitive behaviour	• Concentration • Fun • Time distortion • Telepresence • Exploratory behaviour	• Addictive behaviour (behavioural disorder, obsession and confusion of objectives)	Flow experience in addictive behaviour related to internet gambling	395 users with experience in online interactive games

(continued)

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Author/s and year	Antecedents of flow	Flow experience	Consequences of flow	Object of study	Scope of analysis
Finneran and Zhang (2003)	• Task • Tool • Person (status, feature)			Flow experience in computer-mediated environments	Web users (conceptual model)
Huang (2003)	• Complexity • Interactivity • Innovation	• Control • Focus attention • Curiosity • Intrinsic interest	• Utilitarian aspects of Web performance • Hedonic aspects of Web performance	Flow experience according to website attributes	243 web users
Korzaan (2003)			• Exploratory behaviour • Attitude • Purchase intention	Flow experience in the consumer's online purchase intention	342 undergraduate students
Luna et al. (2003)	• Interactivity • Challenges • Focus attention • Attitude toward the website		• Purchase intention • Intention to repeat the visit	Consumer's flow experience in a specific website and in a transcultural context	111 web users
Novak et al. (2003)	• Challenges • Skills • Focus attention • Importance • Interactivity (speed) • Time distortion • Stimulation • Telepresence • Control		• Exploratory behaviour	Flow experience in the online consumer	588 web users
Chung and Tan (2004)	• Content • Speed • Ease of use • Curiosity or experimentation • Variety • Navigation • Feedback • Perceived usefulness • Focus attention • Control • Search motivation	• Perceived fun		Background of the perception of fun in the acceptance of websites for general information searches	154 undergraduate and graduate students who are internet users

(continued)

(continued)

Author/s and year	Antecedents of flow	Flow experience	Consequences of flow	Object of study	Scope of analysis
Dailey (2004)	• Control		• Negative attitude • Website acceptance/ rejection conducts	Experience of flow and psychological reactance in online consumer behaviour caused by restrictive navigation signals	Web consumers (conceptual model)
Hsu and Lu (2004)	• Ease of use	• Involvement • Fun • Control • Concentration • Intrinsic interest	• Intention of use	User's flow experience in the adoption of online games	233 online game users
Mathwick and Rigdon (2004)	• Challenges/skills in information searches • Perception of control		• Fun (enjoyment and immersion) • Attitude toward the brand • Attitude toward the website	User's experience of flow and fun in online information searches	110 web users with experience in online information searches
Pace (2004)	• Clear goals • Feedback • Curiosity • Urgency • Challenges/skills • Focus attention • Distractions • Interest in the content • Usability	• Enjoyment in discovering and learning • Loss of awareness of irrelevant factors • Time distortion • Merging of action and awareness • Control • Mental alertness • Telepresence		User's flow experience in information search activities on the Web	22 web users
Pilke (2004)	• Concentration • Challenges/skills • Control • Immediate feedback • Clear goals • Good usability			Flow experience in the use of information technology	20 undergraduate or graduate students who are ICT users
Skadberg and Kimmel (2004)	• Quick response from the website • Interactivity • Attractiveness of a website • Ease of use	• Time distortion • Enjoyment • Telepresence	• Increased learning • Changes in attitude and behaviour	Flow experience in the individual's behaviour in a tourism website	272 tourism website users

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Author/s and year	Antecedents of flow	Flow experience	Consequences of flow	Object of study	Scope of analysis
Smith and Sivakumar (2004)		• Intensity • Duration	• Navigation • Impulse purchasing • Repetition purchasing • (certain purchasing behaviours)	Flow experience in online purchasing behaviour	Web consumers (conceptual model)
Shoham (2004)	• Challenges/skills	• Clear goals • Immediate feedback • Focused concentration • Control • Time distortion • Self-transcendence		Flow experience and image management in the behaviour of the user in an ethnography chat room	Between 500 and 1,000 users in portal rooms Between 10 and 100 in specific rooms
Jiang and Benbasat (2005)	• Visual control • Functional control	• Control • Focus attention • Cognitive enjoyment	• Perceived diagnosticity (usefulness of the shopping experience in evaluating products)	Virtual control in the flow experience and perceived diagnosticity	53 undergraduates and graduate students
Pearce (2005)	• Challenges • Skills	• Perception of control • Enjoyment	• Learning	Flow experience in an online training environment	42 first-year information systems students and 17 first-year physics students
Richard and Chandra (2005)	• Challenges • Skills • Interactivity • Need for cognition		• Optimal stimulation level • Involvement in the website • Exploratory behaviour • Attitude toward the website • Pre-purchase intentions	Flow experience in the consumer's navigation behaviour on a pharmaceutical website	264 users of a pharmaceutical website

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Author/s and year	Antecedents of flow	Flow experience	Consequences of flow	Object of study	Scope of analysis
Sánchez-Franco (2005)	• Challenges • Skills • Involvement • Concentration • Stimulation • Control • Telepresence • Time distortion		• Positive affects • Tendency to play (cognitive spontaneity) • Exploratory behaviour	Flow experience in the Web user's behaviour	1,154 web users
Sánchez-Franco and Roldán (2005)	• Ease of use • Control • Challenges/skills	• Enjoyment • Concentration	• Usefulness • Intention of use • Attitude toward the use	Flow experience of directed and experiential users in the acceptance and use of the Web	340 web users
Sicilia et al. (2005)	• Interactivity		• Attitude toward the website	Interactivity in processing information from a website and the consumer's flow experience	213 university students who are Web users
Siekpe (2005)		• Concentration • Control • Challenges • Curiosity	• Purchase intention • Intention to repeat the visit	Multidimensionality of flow in the online shopping experience of consumers	281 web users
Wu and Chang (2005)	• Interactivity	• Enjoyment • Time distortion	• Interaction intentions	Flow experience in the consumer who is a member of an online travel community	286 users who are members of an online travel community
Chen (2006)	• Potential control • Merging of action and awareness • Immediate feedback • Clear goals	• Concentration • Loss of self-consciousness • Time distortion • Telepresence	• Positive affects • Enjoyment	User's flow experience during Web activities	233 web users
Huang (2006)		• Control • Curiosity • Enjoyment • Intrinsic interest		Flow experience and durable and situational involvement	290 undergraduate and graduate students who are Web consumers 363 web consumers

(continued)

(continued)

Author/s and year	Antecedents of flow	Flow experience	Consequences of flow	Object of study	Scope of analysis
Sharafi et al. (2006)		• Pleasure • Concentration • Control • Exploration • Challenges		User's flow experience in the use of information technology	290 ICT users
Wan and Chiou (2006)		• Intrinsic interest • Curiosity • Control • Focus attention		Flow experience and humanistic theory of needs in motivation behind online gaming addiction	127 adolescent students with experience in online games 182 adolescent students with experience in online games
Pace (2007)		• Clear goals • Significant feedback • Interest • Challenges/skills • Focus attention • Time distortion • Rich sensory experience • Telepresence		Flow experience in the design of online learning environments	Students in an online learning environment (conceptual model)
Sánchez-Franco et al. (2007)	• Ease of use • Control • Challenges/skills	• Enjoyment • Concentration	• Usefulness • Intention of use • Attitude toward use	User's flow experience in the acceptance and use of the Web	227 internet users
Bridges and Florsheim (2008)	• Challenges • Skills • Control • Interactivity (speed) • Stimulation • Importance • Telepresence • Time distortion		• PIU • Online shopping	Directed hedonic elements of flow experience in online consumer behaviour	337 university students

(continued)

(continued)

Author/s and year	Antecedents of flow	Flow experience	Consequences of flow	Object of study	Scope of analysis
Chang and Wang (2008)	• Interactivity • Ease of use	• Perception of control • Enjoyment in shopping • Concentration	• Usefulness • Attitude toward The use • Behavioural intention	Flow experience in the user's communication behaviour	426 web users experienced in online communication tools
Thatcher et al. (2008)	• Problematic internet use (PIU) • Procrastination			Flow experience, problematic internet use and internet procrastination	1,399 internet users
Guo and Poole (2009)	• Complexity of the website • Skills/challenges • Feedback	• Concentration • Merging of action and awareness • Control • Time distortion • Loss of self-consciousness • Autotelic experience		Flow experience in online shopping	354 university students who are web users
Liu et al. (2009)	• Types of e-learning presentation	• Concentration	• Intention to use e-learning technology	Flow experience and wealth of media in the acceptance and use of e-learning technology	88 students of an online training course in information systems
Lee and Chen (2010)		• Concentration • Enjoyment • Telepresence • Time distortion		Consumer's flow experience	288 university students
Srivastava et al. (2010)	• Need for cognition • Self efficacy	• Time distortion • Skills		User's flow experiences	113 internet users
Hsu et al. (2012)			• Continuance intention • Purchase intention • Impulsive buying.	Consumer's flow experiences	395 customers of an online shopping store

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Research on the Use, Characteristics, and Impact of e-Commerce Product Recommendation Agents: A Review and Update for 2007–2012

Bo Xiao and Izak Benbasat

Abstract Five years have passed since the publication of our MISQ 2007 paper on the use, characteristics, and impact of e-commerce product recommendation agents (RAs). We are interested to learn how the research on e-commerce product RAs has progressed since then. More specifically, we are interested to find out whether the conceptual model that we have developed in our MISQ 2007 paper have received further empirical support and how the conceptual model has been extended. In this chapter, we review empirical studies on e-commerce product recommendation agents published between 2007 and 2012, particularly with respect to the theory that we have advanced in the MISQ 2007 paper. In addition, we update our original conceptual model by integrating important additional dimension(s), if any, revealed in the review of empirical studies.

Keywords Product recommendation agents · Electronic commerce · Adoption · Consumer decision making · Social presence

1 Introduction

With the rapid growth of electronic commerce (e-commerce), consumers' purchasing decisions are increasingly made in an online environment. The Cisco IBSG Economics and Research Practice estimates that global ecommerce will

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reach almost $1.4 trillion in 2015, with a five-year compound annual growth rate (CAGR) of 13.5 %.[1] Forrester Research projects that online shoppers will spend $327 billion in 2016 in the United States alone, up 45 % from $226 billion in 2012 and 62 % from $202 billion in 2011.[2] To facilitate consumers' online decision making, many online stores have made available technological features that can convey information about product quality and assist consumers in product search and selection, an example being web-based product recommendation agents (RAs). RAs are software artifacts that take as input individual consumers' product-related interests or preferences, obtained either explicitly or implicitly, and subsequently provide recommendations for products that match the consumers' expressed interests or preferences (Xiao and Benbasat 2007). By providing product advice based on user-specified preferences, a user's shopping history or browsing pattern, or choices by other consumers with similar profiles, RAs have the potential to improve consumers' decision quality while reducing their information overload and search complexity (Xiao and Benbasat 2007).

In 2007, we published a Theory and Review paper in Management Information Systems Quarterly (MISQ) on e-commerce RAs (i.e., Xiao and Benbasat 2007, hereafter referred to as MISQ 2007 paper) that develops a conceptual model (see Fig. 1) concerning the outcomes of RA use and RA adoption intentions in e-commerce settings, on the basis of a thorough review of existing literature on e-commerce RAs (beyond algorithms) and drawing from five theoretical perspectives (i.e., theories of human information processing, theory of interpersonal similarity, theories of trust formation, technology acceptance model (TAM), and theories of satisfaction). Adopting a dual focus on (1) consumers' decision-making processes and outcomes with the assistance of RAs, and (2) users' subjective evaluation of RAs, the MISQ 2007 paper presents a set of theory based propositions concerning the effects of RA use, RA input/process/output characteristics, and other factors (i.e., those related to product, user, user–RA interaction, and provider credibility) on consumers' decision making processes and outcomes, as well as on their evaluation of RAs (i.e., trust, perceived usefulness, perceived ease of use, and satisfaction). The propositions provide answers to the two research questions that initially motivated the MISQ 2007 paper (see Table 1 for a summary of propositions and the research questions they answer). In addition to compiling and synthesizing existing knowledge on RA use, characteristics, and impact from multiple disciplines, this chapter also identifies critical gaps in prior literature and alerts scholars to potential opportunities for key contributions. During the period from 2007 to 2012, the MISQ 2007 paper has received more than 200 citations from other researchers (based on a Google Scholar search in November 2012).

[1] http://www.cisco.com/web/about/ac79/docs/retail/Global-eCommerce_POV_IBSG_0407.pdf

[2] http://www.forrester.com/US+Online+Retail+Forecast+2011+To+2016/fulltext/-/E-RES60672?docid=60672

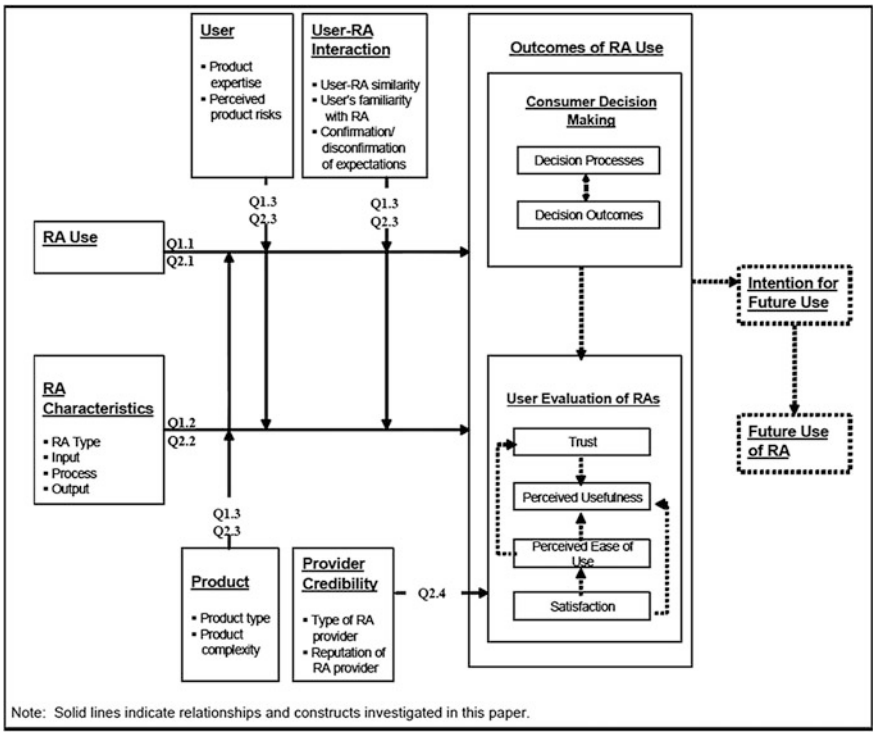

Fig. 1 Conceptual model in our MISQ 2007 paper. *Source* Xiao and Benbasat 2007. Copyright © 2007 by the Regents of the University of Minnesota. Reprinted by permission

Now that five years have passed since the publication of our MISQ 2007 paper, we are interested to learn how the research on e-commerce product RAs has progressed since then. More specifically, we are interested to find out whether the conceptual model (and the supporting propositions) that we have developed in the MISQ 2007 paper have received further empirical support and how our conceptual model has been extended. Therefore, the main objective of the current chapter is to review empirical studies on e-commerce product RAs published in the last five years, particularly with respect to the theory that we have advanced in the MISQ 2007 paper. An additional objective of this chapter is to update our original conceptual model (presented in the MISQ 2007 paper) by integrating important additional dimension(s), if any, revealed in the current review of empirical studies.

The remainder of the chapter proceeds as follows. First, we describe the inclusion criteria for the review. Next, we present a summary of the included empirical studies. After that, we highlight four topic areas in which considerable research has been conducted and discuss the findings of relevant studies. Finally, we conclude the chapter by presenting an updated conceptual model that integrates important dimension(s) revealed from this review exercise.

Table 1 Propositions (P) answering research questions (RQs)

RQ1	**How do RA use, RA characteristics, and other factors influence consumer decision making processes and outcomes**?
RQ1.1	**How does RA use influence consumer decision making processes and outcomes**?
	P1: *RA use* influences users' *decision effort*
	P1a: *RA use* reduces the *extent of product search* by reducing the total size of alternative sets processed by the users as well as the size of the *search set*, *in-depth search set*, and *consideration set*
	P1b: *RA use* reduces users' *decision time*
	P1c: *RA use* increases the *amount of user input*
	P2: *RA use* improves users' *decision quality*
RQ1.2	**How do the characteristics of RAs influence consumer decision making processes and outcomes**?
	P3: *RA type* influences users' *decision effort* and *decision quality*
	P3a: Compared with pure *content-filtering* RAs or pure *collaborative-filtering* RAs, *hybrid* RAs lead to better *decision quality* and higher *decision effort* (as indicated by *amount of user input*)
	P3b: Compared with *non-compensatory* RAs, *compensatory* RAs lead to better *decision quality* and higher *decision effort* (as indicated by *amount of user input*)
	P3c: Compared with *feature-based* RAs, *needs-based* RAs lead to better *decision quality*
	P4: The *preference elicitation method* influences users' *decision quality* and *decision effort*. The *explicit preference elicitation method* leads to better *decision quality* and higher *decision effort* (as indicated by *amount of user input*) than does the *implicit preference elicitation method*
	P5: *Included product attribute* influences users' *preference function* and *choice*. Included product attributes (in RA's preference elicitation interface) are given more weight in the users' preference function and considered more important by the users than those not included. Product alternatives that are superior on the included product attributes are more likely to be chosen by users than are products superior on the excluded product attributes
	P6: *Recommendation content* influences users' *product evaluation* and *choice*
	P6a: *Recommendations* provided by RAs influence users' *choice* to the extent that products recommended RAs are more likely to be chosen by users
	P6b: The display of *utility scores or predicted ratings* for recommended products influences users' *product evaluation* and *choice* to the extent that products with high utility scores or predicted ratings are evaluated more favorably and are more likely to be chosen by users
	P7: *Recommendation format* influences users' *decision processes* and *decision outcomes*
	P7a: *Recommendation display method* influences users' *decision strategies* and *decision quality* to the extent that sorted recommendation lists result in greater user reliance on heuristic decision strategies (when evaluating product alternatives) and better decision quality
	P7b: The *number of recommendations* influences users' *decision effort* and *decision quality* to the extent that presenting too many recommendations increases users' decision effort (in terms of decision time and extent of product search) and decreases decision quality

Table 1 (continued)

RQ1.3 **How do other factors (i.e. factors related to user, product, and user-RA interaction) moderate the effects of RA use and RA characteristics on consumer decision making processes and outcomes**?

P8: *Product type* moderates the effects of *RA use* on users' *choice*. RA use influences the *choice* of users shopping for *experience products* to a greater extent than that of those shopping for *search products*

P9: *Product complexity* moderates the effects of *RA use* on users' *decision quality* and *decision effort*. The use of RAs for more complex products leads to greater increase in decision quality and greater decrease in decision effort than for less complex products

P10: *Product complexity* moderates the effect of *included product attributes* on users' *choice*. The inclusion effect is stronger for products with negative inter-attribute correlations (i.e. more complex products) than for those with positive inter-attribute correlations (i.e. less complex products)

P11: *Product expertise* moderates the effect of *preference elicitation method* on users' *decision quality*. Preference elicitation method has less effect on the decision quality of users with high product expertise than on the decision quality of those with low product expertise

P12: *Perceived product risks* moderate the effects of *RA use* on users' *decision quality* and *decision effort*. When perceived product risks are high, RA use leads to greater improvements in decision quality and reduction in decision effort than when perceived product risks are low

P13: *User-RA similarity* moderates the effects of *RA use* on users' *decision quality* and *decision effort*. RA use leads to greater increase in decision quality and greater decrease in decision effort when the RAs are similar to the users than when the RAs are not similar to the users

RQ2 **How do RA use, RA characteristics, and other factors influence users' evaluation of RAs**?

RQ2.1 **How does RA use influence users' evaluation of RAs**?

RQ2.2 **How do characteristics of RAs influence users' evaluation of RAs**?

P14: *RA type* influences *users' evaluation of RAs*

P14a: Compared with pure *content-filtering* or pure *collaborative-filtering* RAs, *hybrid* RAs lead to greater *trust*, *perceived usefulness*, and *satisfaction* but to lower *perceived ease of use*

P14b: Compared with *non-compensatory* RAs, *compensatory* RAs lead to greater *trust*, *perceived usefulness*, and *satisfaction* but to lower *perceived ease of use*

P15: The *preference elicitation method* influences users' *perceived ease of use* of and *satisfaction* with the RAs. Compared to an explicit preference elicitation method, an implicit preference elicitation method leads to greater perceived ease of use of and satisfaction with the RAs

P16: The *ease of generating new or additional recommendations* influences users' *perceived ease of use* of and *satisfaction* with RAs. The easier it is for the users to generate new or additional recommendations, the greater their perceived ease of use of and satisfaction with the RAs

P17: *User control* of interaction with RAs' preference-elicitation interface influences users' *trust* in, *satisfaction* with, and *perceived usefulness* of the RAs. Increased user control leads to increased trust, satisfaction, and perception of usefulness

P18: The provision of *information about search progress*, while users await results influences users' *satisfaction* with RAs. Users who are informed about RAs' search progress (while waiting for recommendations) are more satisfied with the RAs

P19: *Response time* influences users' *satisfaction* with RAs. The longer the RAs' response time, the lower the users' satisfaction with the RAs

P20: *Recommendation content* influences users' *evaluation of RAs*

P20a: *Familiar recommendations* increase users' *trust* in the RAs

P20b: The *composition of the list of recommendations*, as reflected by a balanced representation of familiar and unfamiliar (or new) product recommendations, influences users' *trust* in, *perceived usefulness* of, and *satisfaction* with RAs

P20c: The provision of *detailed information about recommended products* increases users' *trust* in, *perceived usefulness* of, and *satisfaction* with RAs

P20d: The provision of *explanation* on how the recommendations are generated increases users' *trust* in and *satisfaction* with RAs

Table 1 (continued)

P21: *Recommendation format* influences users' *perceived usefulness* of, *perceived ease of use* of, and *satisfaction* with the RAs. RAs with clear navigational path and layout are considered more useful, easier to use, and more satisfactory than those without

RQ2.3 **How do other factors (i.e. factors related to user, product, and user-RA interaction) moderate the effects of RA use and RA characteristics on users' evaluation of RAs**?

P22: *Product type* moderates the effects of *RA use* on users' *trust* in and *perceived usefulness* of RAs. Users have higher *trust* in RAs for *experience products* and higher *perceived usefulness* of RAs for *search products*

P23: *Product expertise* moderates the effects of *RA use* on *users' evaluation of RAs* (i.e., trust, perceived usefulness, perceived ease of use, satisfaction). The higher the *product expertise* of the users, the less favorable the *users' evaluation of RAs*

P24: *Product expertise* moderates the effects of *RA type* on *users' evaluations of RAs* (i.e., trust, perceived usefulness, perceived ease of use, satisfaction). The higher the product expertise of the users, the more (less) favorable the users' evaluation of *feature-based* (*needs-based*) RAs. The higher the product expertise of the users, the more (less) favorable the users' evaluation of *content-filtering* (*collaborative-filtering*) RAs

P25: *User-RA similarity* moderates the effects of *RA use* on users' *trust* in, *satisfaction* with, and *perceived usefulness* of RAs. The more the RAs are perceived to be similar to their users, the more they are considered to be trustworthy, satisfactory, and useful

P26: *User's familiarity with RAs* moderates the effects of *RA use* on *trust* in the RAs. Increased familiarity with RAs leads to increased trust in the RAs

P27: The *confirmation/disconfirmation of expectations* about RAs moderates the effects of *RA use* on users' *satisfaction* with the RAs. Confirmation or positive disconfirmation of users' expectations about RAs contributes positively to users' satisfaction with the RAs. In contrast, negative disconfirmation of users' expectations about RAs contributes negatively to users' satisfaction with the RAs

RQ2.4 **How does provider credibility influence users' evaluation of RAs**?

P28: *Provider credibility*, determined by the *type of RA providers* and the *reputation of RA providers*, influences users' *trust* in RAs. RAs provided by independent third party websites are considered more trustworthy than those provided by vendors' websites. RAs provided by reputable websites are considered more trustworthy than those provided by websites that are unknown or non-reputable

Source Xiao and Benbasat (2007)

2 Review of Empirical Studies

This chapter reviews journal and conference papers, published in the period between 2007[3] and 2012, that report empirical studies of e-commerce product RAs. A database search using relevant keywords of literature in information systems, consumer research, computer science, decision science, and human computer interaction was undertaken to identify relevant studies. Leading journals and conference proceedings were also scanned by their table of contents. The criteria for including a particular empirical paper are:

- The study reported in the chapter has not already been discussed in our MISQ 2007 paper;
- The study reported in the chapter involves actual use of an e-commerce product RA by human users[4];
- The study reported in the chapter examines the impact of RA use or RA characteristics on human users[5];
- The study reported in the chapter includes dependent variables that go beyond "accuracy" and "coverage", variables commonly investigated in algorithm-focused research.

A total of 34 empirical papers meet the above-specified criteria and are thus included in the current review.

2.1 Summary of Empirical Studies

In Table 2, we present a summary of the empirical studies included in this review exercise, describing the type of study (e.g., experiment or survey), type of RA (e.g., for music or digital cameras), independent variables, dependent variables, and major findings for each study. We also indicate major research areas (e.g., RA use, RA type, RA input/process/out characteristics) addressed by each study, particularly in relation to the conceptual model advanced in the MISQ 2007 paper.

[3] Empirical papers published in 2006 are also included in the review if they report studies not discussed in the MISQ 2007 paper.

[4] Thus, computational experiments were not included in the current review. Also, we excluded personalization studies not focused on products.

[5] Thus, studies focused only on examining the interrelationships among different user perceptions were not included in the current review.

2.2 Major Topic Areas

Our review of the empirical studies has revealed four major topic areas where considerable research has been conducted and where the conceptual model developed in our MISQ 2007 paper has been extended: RA type, preference elicitation (an RA input characteristic), explanation (an RA input/process/output characteristic), and the social aspects of RA.

RA Type. The MISQ 2007 paper has advanced propositions (i.e., P3, P14, and P24) regarding the effects of different types of RAs (e.g., content filtering vs. collaborative filtering, compensatory vs. non-compensatory) on consumers' decision processes and outcomes as well as their evaluations of the RAs. Some of the empirical studies reviewed in the current chapter primarily extend prior research by examining the interaction between different types of RAs and contextual factors. For instance, drawing on the resource matching theory (Anand and Sternthal 1989), Tan et al. (2010) posit that best decision performance will be achieved when an RA renders cognitive resources that match those demanded for a decision task. The findings of their experimental study revealed that, compared to those using an RA with only non-compensatory screening support, consumers employing an RA with both compensatory evaluation and non-compensatory screening capabilities had higher objective/subjective decision quality in a *high* product attribute-load condition; the difference between consumers using two different RAs was not significant in a *low* product attribute-load condition. Nevertheless, in both high and low product attribute-load conditions, the use of an RA with both compensatory evaluation and non-compensatory screening capabilities led to lower decision time and higher perceived system quality.

Focusing on mobile RAs that support consumer decision making in retail stores, Lee and Benbasat (2010) compared alternative-driven RAs with attribute-driven RAs. The results of a laboratory experiment conducted in a simulated store showed that alternative-driven RAs led to more accurate product choice decisions and higher level of perceived control than did attribute-driven RAs, because of the greater compatibility between the interaction style of alternative-driven RAs and the way in which consumers process information and make purchase decisions in retail stores. Their findings suggest that RAs should be designed to fit the users' task undertaken in a particular context (Lee and Benbasat 2010). In a similar vein, Yang and Wang (2012) evaluated two RAs that provided both kinds of decision support but ordered them differently: an ATT-ALT RA (attribute-based decision support followed by alternative-based decision support) and an ALT-ATT RA (alternative-based decision support followed by attribute-based decision support). Drawing from the regulatory focus theory (Higgins 1998), Yang and Wang (2012) hypothesized and empirically showed that, compared to those with a prevention focus, promotion-focused individuals had higher perceived usefulness, perceived enjoyment, and perceived control when using an ATT-ALT RA. Moreover, for both prevention- and promotion-focused individuals, an ATT-ALT RA led to

higher perceived usefulness, perceived enjoyment, and perceived control than did an ALT-ATT RA due to the better fit between the former and the decision task.

A number of empirical studies reviewed in the current chapter have introduced and examined RA types not discussed in the MISQ 2007 paper. For instance, Punj and Moore (2007) distinguish between knowledgeable RAs (that recommend only options exactly matching consumers' specified selection criteria) and smart RAs (that go one step further by also recommending close matches when no alternatives meet consumers' selection criteria completely). They found via an experimental study that, compared to the use of a knowledgeable RA, the use of a smart RA resulted in less iterative search, reduced perceptions of cognitive resources spent, more satisfaction, but less product fit obtained. The findings suggest that, although a smart RA can decrease consumer' decision effort, it does not necessarily help them find product that truly fit their needs. In contrast, a knowledgeable RA increases decision effort but does help consumers identify better fitting products.

To investigate the effect of context-aware recommendations on consumer purchase behavior and trust, Gorgoglione et al. (2011) compare a context-aware RA (that takes into account contextual information such as intent of a purchase or consumer's mood) to a content-based RA (that recommends products similar to the ones a consumer preferred in the past) and one that provides random recommendations. The findings of an experimental study revealed that the context-aware RA outperformed the other two types of RAs in terms of trust (i.e., perceptions of competency, benevolence, and integrity) and other economics-based performance metrics.

In a similar vein, Ho et al. (2011) examine the effects of an adaptive RA (that generates recommendations on the basis of consumers' answers to preference elicitation questions at the start of the shopping task and their current preferences as revealed in their browsing behavior) on consumer behavior by comparing it with a static RA (that generates recommendations solely on the basis of consumers' answers to preference elicitation questions) and taking into account the timing for the RAs to present recommendations. The findings of a field experiment and a laboratory experiment showed that while the quality of recommendations (indicated by the level of match with consumers' preferences) improved when they were provided at a later stage of an online session, the likelihood that consumers would consider and accept a given recommendation diminished over the course of the session.

Finally, comparing personalized RAs for media items (based both on users' explicit feedback and their browsing behavior) with non-personalized RAs that recommend generally most popular items or generate random recommendations, Knijnenburg et al. (2011) showed via a series of experiments that personalized RAs led to higher perceived recommendation quality, choice satisfaction, and system effectiveness.

Preference Elicitation. In the MISQ 2007 paper, we advanced propositions relating to the differential impact of feature-based versus needs-based preference elicitation as well as that of explicit versus implicit preference elicitation (i.e., P4, P11, and P15). Our current review has revealed empirical studies that consider

Table 2 Summary of empirical studies

Paper	Type of study Type of RA	Independent variables	Dependent variables	Major areas addressed	Major findings
Al-Natour et al. (2006)	Experiment (lab) RA for laptops	Suggestive guidance Directives Shopping assistant's decision rules Mediators Customer personality Perceived artifact personality Customer decision strategy Perceived artifact decision strategy	Perceived process similarity Perceived outcome similarity	Social aspects of RAs	Perceived suggestive guidance of the decision aid was related to its perceived dominance Perceived directiveness of the decision aid was directly related to its perceived dominance Customers' perceptions of the decision strategy used by the decision aid were influenced by the decision rules it employs (additive-compensatory or elimination-by-aspect) A user's perceptions of the decision aid's personality (decision strategy) and her own personality (decision strategy) interacted to affect her perceived personality similarity to the RA
Al-Natour et al. (2008)	Experiment (lab) RA for laptops	Perceived process similarity Perceived outcome similarity	Perceived usefulness Trustworthiness Reuse intentions	Social aspects of RAs	Perceived process similarity positively influenced users' perceptions of the decision aid's usefulness and trustworthiness. However, the effects of perceived outcome similarity on trust were fully mediated by perceived process similarity Level of the user's domain knowledge moderated the effects of perceived decision process similarity on both perceived usefulness and trustworthiness
Benlian et al. (2012)	Experiment (online)	Online product recommendation (OPR): provider recommendation (PR) versus consumer review (CR) Product types—moderator (experience and search product) Mediators: Instrumental beliefs (i.e., perceived usefulness and ease of use) Affective beliefs (i.e., perceived affective quality) Trusting beliefs	Online product recommendation reuse Product purchase intentions	RA use compared to the use of consumer reviews	Users of provider recommendation (PRs) express significantly higher perceived usefulness and perceived ease of use than users of consumer reviews (CRs) Users of CRs express higher trusting beliefs and perceived affective quality than users of PRs The effects of online product recommendation (OPR) use on intentions to reuse the OPR and intentions to purchase were significantly mediated by trusting beliefs and perceived affective quality, while they were not significantly mediated by perceived usefulness Trusting beliefs and perceived affective quality partially mediated the effects of OPR use on intentions to reuse and to purchase CRs were found to elicit higher perceived usefulness, trusting beliefs, and perceived affective quality for experience goods, while PRs were found to unfold higher effects on all of these variables for search goods.

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Table 2 (continued)

Paper	Type of studyType of RA	Independent variables	Dependent variables	Major areas addressed	Major findings
Chang and Chin (2010)	Experiment (lab) RA for mini-notebooks	Recommendation sources: word of mouth (WOM), advertising, or recommendation systems Gender (moderator) Perceived risk (moderator)	Intention to purchase online	RA use compared to the use of advertising or WOM	A positive recommendation by WOM led to a stronger increase in willingness to purchase online than did advertising and recommendation systems The effect of WOM, advertising, and recommendation systems on online purchase intentions was greater for female consumers, who perceived higher risks in purchasing.
Chen and Pu (2008)	Cross-cultural lab experiment RA for digital cameras or tablet PCs	Culture background (oriental/western) System difference (with/without the organization-based recommender interface) (ORG/LIST)	Objective measures Objective Accuracy Time consumption Interaction cycles Subjective perceptions: System-design features: Recommendation quality, transparency, user control Overall competence perceptions: Perceived ease of use, perceived usefulness, decision confidence, perceived effort, satisfaction Trusting intentions to purchase, to return, and to save effort in next visit	RA output characteristics → Explanation	An organization based product recommender interface performed significantly better in improving on people's competence perceptions, including perceived recommendation quality, perceived ease of use and perceived usefulness, and positively impacting users' behavioral intentions such as intention to save effort in the next visit Oriental users were observed reacting more significantly strongly to the organization interface regarding some subjective aspects, compared to western subjects There was the dominating role of the recommender system's decision-aiding competence in stimulating both oriental and western users' return intention to an e-commerce website where the system is applied Culture difference did not have significant interaction effect on users' objective decision accuracy and effort in ORG and LIST
Choi et al. (2011)	Experiment (lab) RA for TOEIC books and ringtones	Social presence (varying personalization-related aspects of RA) Trust (mediator) Product type (hedonic and utilitarian) (moderator)	Reuse intention	Social aspects of RAs	Greater social presence increased both reuse intention and trust in the recommender systems The influence of social presence on reuse intention with respect to utilitarian products was less strong than that with respect to hedonic products

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Table 2 (continued)

Paper	Type of studyType of RA	Independent variables	Dependent variables	Major areas addressed	Major findings
Dabholkar and Sheng (2012)	Experiment RA for digital cameras or laptop computers	Participation in using RA (manipulated as the amount of user input obtained from consumers about their product related preferences) Financial risk (moderator)	Satisfaction, trust and purchase intention	RA input characteristics → preference elicitation	Consumer participation in using an RA had a positive effect on satisfaction and trust There was a positive effect of satisfaction on trust in the RA Trust mediated the effect of satisfaction on intention to purchase The level of financial risk associated with the product under consideration reduced satisfaction with the RA For a high-financial risk product purchase, the effects of consumer participation on satisfaction with the RA, trust in the RA, and intention to purchase based on the RA's recommendations were stronger
Doong et al. (2009)	Experiment (lab) RA for mobile set	Virtual product experience when presenting recommendations	Perceived argument quality Perceived source credibility Likelihood of reversal of consumers' first impression bias	RA output characteristics → recommendation presentation modality	Presenting recommended messages with virtual product experience increased consumers' perceived argument quality Presenting recommended messages with virtual product experience increased consumers' perceived source credibility The higher the degree of recognition of argument quality of the recommended messages, the greater the likelihood of reversal of consumers' first impression bias
Gorgoglione et al. (2011)	Experiment RA for comic books and related products, such as DVDs, stickers, and T-shirts	Random/content-based/context-aware recommendations Accuracy of recommendations Precision Average ratings Diversity of recommendation Entropy	Trust Ability Integrity Benevolence Offline Price Purchasing behavior Quantity Price	RA type	Trust was being affected by both accuracy and diversity of recommendations, diversity being the dominant force here The quantity of the purchased products was affected by the accuracy of recommendations and by trust, accuracy being the dominant force in this process Average price of a purchased product was directly affected by the trust the customer has in the recommendation The CARS systems produced better recommendation outcomes than the content-based and random systems
Hess et al. (2009)	Experiment (lab) RA for apartment renting	RA extraversion Interface vividness (text only-T; text and voice-TV; text, voice, and human animation-TVA) Computer playfulness	Perceptions of social presence Trust in RA	Social aspects of RAs	RA personality (extraversion), vividness (text, voice, and animation), and computer playfulness were found to influence social presence Social presence serves as a mediator and increases users' trust in the RA. Vividness has a moderating effect on the relationship between RA extraversion and social presence (increased levels of vividness strengthen this relationship)

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Table 2 (continued)

Paper	Type of studyType of RA	Independent variables	Dependent variables	Major areas addressed	Major findings
Ho et al. (2011)	Lab experiment and field study RA for online book store	Study 1—lab experiment Recommendation type (static, adaptive) Presentation timing Expertise (Moderator) Study 2—Field study: Recommendation type (static, adaptive) Presentation timing Expertise (moderator)	Study 1—lab experiment Number of sampled recommendations Probability of choosing a personalized recommendation Satisfaction, Level of match with consumers' preference Study 2—field study Number of sampled recommendations Probability of choosing a personalized recommendation Satisfaction	Study 1—lab experiment: RA type Study 2—field study: RA type	Study 1—lab experiment: Subjects were found to sample more, and more likely to download them when the recommendation was presented earlier Subjects perceived late-adaptive recommendation to be a better match than an earlier one Late-adaptive recommendations were also perceived to be better match and sampled more compared with late-static ones. Also, they had a higher probability to be chosen and gain more satisfaction The combined effect of time on amount of sampling, probability of choosing a personalized item and satisfaction was more negative for static recommendations than for adaptive recommendations The increase in level of match between late-adaptive and early-adaptive increased with consumer's level of expertise The increase in amount of sampling and probability of choosing a recommendation between late-adaptive and late-static increased with customer's level of expertise Study 2—field study: The hypotheses that consumer would consider more late-adaptive than late-static, and that the increase in amount of sampling between late-adaptive and late-static would increase with customer's level of expertise were not supported
Hostler et al. (2011)	Experiment (lab) RA for movies	Use of RA	Product promotion effectiveness Product search effectiveness Customer satisfaction Unplanned purchase	RA use	RA was positively related to product promotional effectiveness RA was positively related to search effectiveness There was a positive relationship between product promotion effectiveness and search effectiveness Product promotion effectiveness was positively related to consumers' satisfaction Product search effectiveness was positively related to unplanned purchase consumer behavior There was a positive relationship between customer satisfaction with the website and unplanned purchases

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Table 2 (continued)

Paper	Type of studyType of RA	Independent variables	Dependent variables	Major areas addressed	Major findings
Huang and Kao (2011)	Experiment (lab) RA for digital camera	Explanation facility—why Explanation facility—how Domain knowledge (moderator)	Perceived decision process similarity Perceived decision outcome similarity Information diagnosticity Intention to reuse	RA output characteristics → explanation Social aspects of RAs	Decision process and outcome similarity indirectly influenced reuse intention via information diagnosticity, and the effects of process and outcome similarity varied with levels of users' domain knowledge The influence of explanation facility on similarity was not obvious, the effect of "why" explanation facility on outcome explanation is significantly contrary to the expectation
Jin and Sung (2009)	Experiment (lab) Avatar-based RA for clothes in online store on second life	Avatars' different personalities (sincere/competent versus without or less sincere/competent traits)	Trustworthiness and expertise Brand attitude Consumers' feelings of presence Shopping intention	Social aspects of RAs	Subjects who interacted with sincere/competent avatars showed greater source expertise and trustworthiness, a more positive attitude towards the brand, higher satisfaction with the retailer, and greater online shopping intentions than those who interacted with exciting avatars

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Table 2 (continued)

Paper	Type of studyType of RA	Independent variables	Dependent variables	Major areas addressed	Major findings
Knijnenburg et al. (2012)	Experiment (lab) RA for movies	Field trails Personalized versus non-personalized (random or generally most popular) recommendations Experiment 1: Recommendation set composition: Top-5, Top-20, and Lin-20 (i.e., 5 best recommendations, plus recommendations ranked 99, 199 … 1,499) Perceived recommendation variety and quality—mediators Experiment 2: Algorithm: General most popular (GMP), k-Nearest Neighbor algorithm based on explicit feedback (kNN), MF algorithm based on explicit feedback (MF) Diversification (none, little, lot) Expertise Gender Perceived recommendation set diversity and accuracy	Field trails Choice satisfaction Perceived system effectiveness Intention to provide feedback General trust in technology System-specific privacy concerns Experiment 1: Choice difficulty Movie expertise Choice satisfaction Experiment 2: Choice difficulty Perceived system effectiveness Choice satisfaction	Field trails: RA type Experiment 1: RA output characteristics → recommendation set composition Experiment 2: RA output characteristics → recommendation set composition	Field trails Recommender algorithm that provided personalized recommendations had a better user experience (in terms of both choice satisfaction and system effectiveness) than a system that provided random recommendations Experiment 1: There was a positive effect of the quality of the recommendations and a negative effect of choice difficulty on choice satisfaction. High-variety recommendations increased choice difficulty The Top-20 set was more varied than Top-5 (and thereby more attractive), but it was also more difficult to make a choice from this set, and these effects leveled out to eventually show no difference in choice satisfaction The Lin-20 set was less attractive than the Top-5, but there was a positive residual effect on choice satisfaction Experiment 2: More diverse recommendations were perceived as more accurate less difficult to choose from. Users who rated the recommendations as accurate also perceived the system to be more effective The more effective the system and the easier the choice, the more satisfied participants were with their choices Males found the recommendations generally less accurate Expertise increased the perceived accuracy and diversity of the recommendations and also increased the choice satisfaction

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Table 2 (continued)

Paper	Type of studyType of RA	Independent variables	Dependent variables	Major areas addressed	Major findings
Köhler et al. (2011)	Experiment (lab) Experiment 1: RA for vacation destinations or DVD movies Experiment 2: RA for cars	Experiment 1: RA design (abstract, concrete) Temporal Distance (Consumption moment)—moderator Perceived transparency of RA—mediator Experiment 2: RA design (abstract, concrete) Temporal Distance (RA process timing)	Experiment 1: RA's advice acceptance likelihood Experiment 2: RA's advice acceptance likelihood	Experiment 1: RA type Experiment 2: RA type	Experiment 1: Congruency between consumption timing (immediate versus distant) and RA communication design (concrete versus abstract, respectively) increased the likelihood to accept the RA When consumers perceived an RA process as more transparent (i.e., when their mental representation triggered by the temporal distance matched the RA's communication design), they were more likely to accept the RA's advice The process is mediated by the perceived transparency of the RA process Experiment 2: Congruency between RA process timing (immediate versus delayed delivery of recommendations) and RA communication design (concrete versus abstract, respectively) increased the likelihood to accept the RA' advice Interaction effect of temporal distance and RA communication design on the likelihood of RA advice acceptance was fully mediated by the level of perceived transparency of the RA process
Kwon and Chung (2010)	Experiment (lab) RA for mobile phones and computer tables	Online shopping recommendation mechanisms (OREMs) (causal map—online shopping recommendation mechanisms (CM-OREMs) versus traditional-online shopping recommendation mechanisms (TR-OREMs)) Involvement type (moderator) Reactance level (moderator)	Consumer decision satisfaction, Decision confidence, Attitude toward the recommended products Purchasing intention	RA input characteristics → explanation	Decision satisfaction and decision confidence were significantly higher for users of CM-OREM than for users of the traditional one Attitude toward product recommended was more positive for users of CM-OREMs than for users of traditional recommendation, and the purchase intention was also higher Reactance level exhibited a significant moderating effect on the relationships between recommendation type and all the dependent variables except decision confidence. For participants who used the CM-OREM, there was no significant difference in all four dependent variables irrespective of reactance level Product-involvement type exhibited a significant moderating effect on recommendation type for all dependent variables

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Table 2 (continued)

Paper	Type of studyType of RA	Independent variables	Dependent variables	Major areas addressed	Major findings
Lee and Lee (2009)	Experiment (lab) RA for a commercial shopping mall	Expected personalization (manipulated as the amount of information collected by the website for recommendation) Threat to use Perceived usefulness Perceived ease of use	Intention to use	RA input characteristics → amount of user input	Expected personalization had a significant positive relation with perceived usefulness Threat to future usage was negatively related with intention to use
Lee and Benbasat (2010)	Experiment (lab) Mobile RA for printers	Type of RA (no RA, Alternatives driven RA—RA-AL, and Attribute drive RA—RA-AT)	Decision-making Time Perceived Effort Decision Accuracy Pattern of information Acquisition Perceived control	RA type	RA-AL and RA-AT users spent more time making decisions and perceived less effort in making product choice than RA nonusers RA-AL users made more accurate product choice decisions than RA nonusers. The similar effect was not found among RA-AT users and RA nonusers Compared to RA-AT users, RA-AL users acquired information from products displayed on shelves in the phase of screening products, perceived higher level of control, and made more accurate decision RA-AL users did not spend less time than RA-AT users
Lee and Benbasat (2011)	Experiment (lab) RA for used cars	RA types (RA-weighted and RA-cutoff) Decision context (loss and gain)—moderator	Perceived control, perceived accuracy, perceived effort, and usage intentions Trade-off difficulty	RA type	The preference elicitation method (PEM) that highlighted trade- offs (RA-weighted) increased a user's trade-off difficulty Trade-off difficulty generated by an RA PEM influenced perceived accuracy and effort through perceived control. Perceived control increased perceived accuracy and decreased perceived effort Perceived accuracy increased usage intention, and perceived effort decreased it Users evaluated the same PEMs differently under different circumstances. Trade-off-compelling PEMs generated trade-off difficulty to a greater degree in a loss condition than in a gain condition. Influence of perceived effort on usage intention was less in a loss condition than in a gain condition

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Table 2 (continued)

Paper	Type of studyType of RA	Independent variables	Dependent variables	Major areas addressed	Major findings
Li and Tsekouras (2012)	Experiment (lab) RA for cars	Types of effort: Perceived RA effort Perceived own effort Perceived effort of use Effort sign (perceived RA effort < perceived own effort) (moderator) User familiarity Product familiarity Process familiarity	Perceived RA quality RA acceptance	User-RA interaction → user effort versus RA effort	Perceived RA effort had a positive effect on RA quality perception Users of a RA attempted to reduce their effort in terms of website navigation The effect of perceived own effort on RA quality was negative only when own effort was perceived to be higher than the effort exerted by RA RA quality was a core driver of RA acceptance
Lui and Hui (2010)	Online experiment RA for laptop computers	Features of avatar agent: Gender Facial expression (smiling/not smiling)	Trusting belief Competence Integrity Benevolence	Social aspects of RA	Smiling agents were perceived to be more competent than non-smiling agents and male agents were perceived to be more competent than female agents There was a significant interaction effect between an agent's smile and gender on trust in benevolence Male subjects tended to believe that smiling agents were more competent than non-smiling agents, while female subjects were less sensitive to the agent's smile Female subjects perceived male agents to be more competent than female agents, while male subjects were almost indifferent toward the agent's gender Trust in benevolence was highest toward a smiling male agent among the female subjects
Pu and Chen (2007)	Experiment (lab) RA for cameras and notebooks	Recommendation system interface (organization-based explanation interfaces and "why" interface)	Trust in recommendation systems Perceived competence Perceived effort Perceived accuracy Actual task time Intention to return	RA output characteristics → explanation	Organization-based interface was shown to be significantly more effective in building user trust than the traditional approach. The former was perceived to be more capable and efficient in assisting users to make decisions, and generated higher reuse intention

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Table 2 (continued)

Paper	Type of studyType of RA	Independent variables	Dependent variables	Major areas addressed	Major findings
Pu et al. (2008)	Experiment (lab) RA for apartment rental	Experiment 1: Recommendation interface (example critiquing—EC versus RankedList) Tradeoff tasks with 1 attribute, 2 attributes and more than 2 attributes Experiment 2: Recommendation interface (EC and EC with fisheye) Tradeoff tasks with 1 attribute, 2 attributes and more than 2 attributes	Experiment 1: Task completion time Error rate Confidence level Experiment 2: Task completion time Error rate Confidence level	Experiment 1: RA input characteristics → ease of generating new recommendations Experiment 2: RA output characteristics → recommendation presentation interface	Experiment 1: Users took increasingly less time and made fewer errors when performing tradeoff tasks using EC even though the task complexities increased The difference in task completion time for RankedList compared to EC increased as tradeoff tasks became more complex While the error rate for the second and third categories of tasks decreased both for EC and RankedList, the average of errors committed for RankedList remained high Experiment 2: Fisheye EC enabled users to quickly find tradeoff alternatives The enlarged set provided users with a high level of certainty for their resulting choice
Punj and Moore (2007)	Experiment (lab) RA for apartment rental	Types of RA (smart RA vs. knowledgeable RA) Number of alternatives (many, few) Time available (more or less)	Number of alternatives examined Number of search iterations Size of final consideration set Total set of alternatives considered Perceived cognitive effort Perceived product fit Satisfaction with search	RA type	Use of a "smart" recommendation agent resulted in less iterative search, a larger consideration set, reduced perceptions of cognitive resources spent and product "fit" obtained, but more satisfaction
Qiu and Benbasat (2009)	Experiment (lab) RA for digital cameras	Presence or absence of an animated output modality of the agent (text, text-to-speech voice, or human voice)	Social presence Trust believe Perceived usefulness Perceived enjoyment Usage intention	Social aspects of RA	Using humanoid embodiment and human voice–based communication positively influenced users' perceptions of social presence, which in turn enhanced users' trusting beliefs, perceptions of enjoyment, and ultimately, their intentions to use the agent as a decision aid

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Table 2 (continued)

Paper	Type of studyType of RA	Independent variables	Dependent variables	Major areas addressed	Major findings
Qiu and Benbasat (2010)	Experiment (lab) RA for digital cameras	User-PRA gender match/mismatch User-PRA ethnicity match/mismatch User's gender	Social presence Perceived enjoyment Perceived usefulness	Social aspects of RA	PRAs that matched the ethnicity, though not the gender, of their users were perceived as more sociable, more enjoyable, and more useful to interact with than the mismatched ones The "matching-up" effects of ethnicity were more significant among female users than among males
Tan et al. (2010)	Experiment (lab) RA for household items (washing machine and a mini audio system)	Decision aid features (low versus high-screening support, and aids with weight assignment and computation decision tools) Attribute load (i.e., large versus small number of product attributes)	Decision process (decision time) Decision outcome (decision quality) Subjective evaluation of decision process (perceived system quality) Subjective evaluation of decision outcome (perceived decision quality)	RA type	Where the decision aids rendered cognitive resources that matched those demanded for the task environment, consumers processed more information and decision performance were enhanced Where the decision aids rendered cognitive resources that exceeded those demanded for the task environment, consumers engaged in less task-related elaboration of decision-making issues to the detriment of decision performance Where the decision aids rendered cognitive resources that fell short of those demanded for the task environment, consumers used simplistic heuristic decision strategies to the detriment of decision performance or invested additional effort in information processing to attain a better decision performance if they perceived the additional investments in effort to be manageable
Thirumalai and Sinha (2011)	Field study RA for online retailers	Decision customization Transaction customization	Customer satisfaction with decision-making sub-processes Customer satisfaction with transaction sub-processes	RA use	Decision customization that provided choice assistance by way of personalized product recommendations was positively associated with customer satisfaction with the decision-making sub-process Transaction customization, oriented towards making the transaction sub-process personal, convenient, and interactive, was positively associated with customer satisfaction with the purchase transaction sub-process Both decision customization and transaction customization were associated with overall customer satisfaction with the online purchase process of electronic retailers

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Table 2 (continued)

Paper	Type of studyType of RA	Independent variables	Dependent variables	Major areas addressed	Major findings
Wang and Doong (2010a)	Experiment (lab) RA for eBooks	Argument form (claim only, claim plus data and warrant, and claim plus data and backing) Spokesperson type (Web itself, expert, customer)	Argument quality Source credibility Purchase intention	RA output characteristics → explanation	Customers' perceptions of the argument quality and source credibility of the RA's recommendations were found to effectively influence their purchase intentions at the Webstore Customers' perceptions of argument quality and source credibility differed significantly as a result of the varied argument forms Although the various spokesperson types generated significantly different levels of source credibility, argument quality remained unchanged
Wang and Doong (2010b)	Survey RA for online store	Personal innovativeness (adaptors to innovators) Personal involvement (less involved to more involved)	Deliberation of RA's advice	RA use	Both customers' adaptive-innovative style and involvement level were found to be significantly and positively related to their deliberation on the RA's advice; these two traits interacted with each other and shaped customers' consideration of the RA's advice to four significantly different extents More-involved adaptors were found to consider the RA's advice more frequently than the other segments
Wang and Benbasat (2012)	Experiment (lab) RA for digital cameras	User-system interaction mode—USIM (user-guided versus system-controlled) Decision strategy (AC versus elimination)—moderator User's product knowledge (high, low)—moderator	Perceived cognitive effort Perceived quality Advice acceptance Number of iterations	RA input characteristics → user control in preference elicitation	Users evaluated user-guided USIM more positively than system-controlled USIM. And such effects were stronger for the elimination-based RA than for the AC-based RA and for low product knowledge users than for high product knowledge users

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Table 2 (continued)

Paper	Type of studyType of RA	Independent variables	Dependent variables	Major areas addressed	Major findings
Yang and Wang (2012)	Experiment (lab) RA for T-shirts	Decision support tools (attributed-based DSS/Alternative-based DSS) Regulatory focus (promotion-focused/prevention-focused) (predictor and moderator)	Perceived usefulness (mediator) Perceived ease of use (mediator) Perceived enjoyment (mediator) Perceived control (mediator) Intention to purchase Intention to return	RA type	Users of an attributed-based DSS showed higher perceived usefulness and perceived control than did users of alternative-based DSS For both tools, users who were promotion-focused expressed higher perceived ease of use than users who were prevention-focused For attributed-based DSS, users who were promotion-focused showed higher perceived usefulness, perceived enjoyment, and perceived control than users who were prevention-focused The effect of attributed-based DSS on intention to purchase was fully mediated by users' perceived usefulness, perceived enjoyment, and perceived control The effect of attributed-based DSS on intention to return was mediated by users' perceived usefulness
Zhang et al. (2011)	Experiment (lab) Amazon's RA for DVDs	Recommendation quality (manipulated as the amount of consumer input provided to the RA) Website knowledge	Online Product Brokering Efficiency—Evaluation cost Screening cost Decision-making quality Store loyalty Repurchase intention	RA input characteristics → amount of user input	Retailer learning reflected in higher quality personalized product recommendations (PPRs) was associated with lower product screening cost, but higher product evaluation cost Higher quality PPRs were associated with greater value derived by consumers from the online product brokering activity in terms of higher decision making quality, which was positively correlated with repurchase intention

other aspects of the RA's preference elicitation process. For instance, extending the effort-accuracy perspective of understanding users' RA acceptance by considering trade-off difficulty, Lee and Benbasat (2011) compared a preference elicitation method that made the trade-offs among product attributes explicit and one that hid such trade-offs and found that the former resulted in higher trade-off difficulty, which in turn led to lower perceived control and higher perceived effort. Further, Lee and Benbasat (2011) demonstrated that the negative effect of a trade-off compelling preference elicitation method on users' trade-off difficulty was enhanced in a *loss* situation (e.g., when users were asked to choose a product inferior to the one they currently owned) as opposed to a *gain* situation (e.g., when they asked to choose a product superior to the one they currently owned).

Distinguishing between a concrete RA communication design (similar to an RA employing feature-based preference elicitation) and an abstract RA communication design (similar to an RA employing needs-based preference elicitation), Köhler et al. (2011) posit that temporal distance moderates the effectiveness of two types of RA communication designs such that the congruency between the timing of product consumption or recommendation presentation and RA communication design will increase the likelihood to accept the RA's recommendation. Their experimental study found that when consumption timing was immediate or when an RA's recommendations were presented immediately, a concrete RA communication design led to higher likelihood of accepting the RA's recommendations. On the other hand, when consumption timing was distant or when an RA's recommendations were presented with a delay, an abstract RA communication design led to higher likelihood of accepting the RA's recommendations.

In contrast to the two studies discussed above that focus on the *content* of preference elicitation, an experimental study by Zhang et al. (2011) showed that a larger amount of consumer input provided to an RA led to higher perceived recommendation quality, which in turn led to improved decision quality and reduced task effort. In a similar vein, Dabholkar and Sheng (2012) showed that RAs that allowed greater consumer participating (by obtaining larger *amount* of input from consumers about their product related preferences) before generating recommendations led to more satisfaction, greater trust, and higher purchase intentions; the effects were found to be stronger for high financial risk product purchase than for low financial risk product purchase.

Explanation. In the MISQ 2007 paper, we propose that the provision of explanations on how the RA's recommendations are generated will increase users' trust in and satisfaction with the RA (i.e., P20d). A number of studies included in the current review exercise further the research on RA explanations by going beyond the question of "*whether or not* explanations are provided" to investigate *how* explanations should be provided to users. For instance, Pu and Chen (Chen and Pu 2008; Pu and Chen 2007) propose an explanation interface that categorizes recommended products (other than the top candidate) according to their trade-off properties (when compared to the top candidate) and provides a title to each category (e.g., "These products have cheaper price and longer battery life, but slower processor speed and heavier weight") as the explanation for why the

products in that category are recommended. The idea is that, instead of explaining each recommended product, a group of products with shared trade-off characteristics compared to a reference product (i.e., the top candidate) can be explained together by a category title, which indicates aspects in which the group of products are superior or inferior to the reference product. The results of a series of empirical studies revealed that the new explanation interface outperformed the traditional explanations (provided separately to individual products in a ranked list) in improving users' competency perceptions (i.e., perceived recommendation quality, perceived usefulness, and perceived ease of use), reducing their perceived cognitive effort, and increasing their reuse intention.

Kwon and Chung (2010) posit that e-commerce product RAs should consider both quantitative factors (e.g., price, size, and color) and qualitative factors (e.g., brand satisfaction, fun, and comfortableness) in making recommendations. To help consumers better assess their own preference on qualitative factors, Kwon and Chung (2010) designed a causal map to illustrate the causal relationship among the quantitative and qualitative factors of a product. They found via an experimental study that, compared to an RA that generated recommendations based solely on consumers' expressed preferences on quantitative factors, an RA that incorporated a causal map to help consumers express their preferences on qualitative factors, in addition to quantitative factors, led to higher decision satisfaction and decision confidence as well as more positive attitude towards the recommended products; the effects were more pronounced for high-involvement products (e.g., mobile phones) than for low-involvement products (e.g., computer tables).

Wang and Doong (2010a) assert that claims offered in an RA's recommendations should be supported with strong justifications structured in accordance with the Toulmin's model of argumentation (Toulmin 1958), which consists of four interrelated argument elements—claim, data, warrant, and backing. They argue that, in the absence of face-to-face contact online, "argument forms that describe what a system does, how it works and why its actions are appropriate are crucial to facilitate the interaction between customers and RA recommendations" (p. 494). The results of an experiment manipulating different argument forms revealed that RA recommendations that integrated additional data and statistic evidence to support claims led to highest perceived argument quality and perceived source credibility, which in turn resulted in enhanced consumers' purchase intention at the web store.

Social Aspects of RAs. When we were conducting our reviews for the MISQ 2007 paper, literature on RAs was characterized by a focus on the functionality design and utilitarian values of such systems, placing particular emphasis on investigating how the use and different input/process/output design characteristics of RAs contribute to reduced consumers' decision effort, improved decision quality, as well as enhanced perception of RA usefulness and ease of use. The social design of RAs and their social benefits were largely overlooked in the literature and thus were not included in our conceptual model. However, the last few years have witnessed an increasing scholarly attention to the social aspects of RAs.

Researchers have primarily drawn on the "Computers as Social Actors" (CASA) paradigm to examine users' perceptions of RAs with social attributes. CASA posits that users of interactive technological artifacts (such as RAs) tend to perceive these artifacts as social actors (Reeves and Nass 1996). As such, users will ascribe social attributes to the technological artifacts and apply social rules when interacting with them (Reeves and Nass 1996), particularly when the artifacts are perceived to possess characteristics normally associated with human beings (Qiu and Benbasat 2009). The most-studied construct in this stream of research is *social presence*, the feeling of "being with another", which is conceptualized as the warmth, sociability, sensitivity, and feeling of human contact conveyed by a communication medium or technological artifact (Hess et al. 2009; Qiu and Benbasat 2009; Qiu and Benbasat 2010). Prior research has demonstrated the positive influence of social presence on other technology-related perceptions such as usefulness, enjoyment, and trust (see a brief review by Hess et al. 2009).

Our current review has revealed different design characteristics of e-commerce product RAs that can enhance users' perception of social presence. For instance, Qiu and Benbasat (2009) found that users perceived greater social presence when interaction with an RA with humanoid embodiment (compared to an RA without humanoid embodiment) or human speech output (compared to an RA with textual or text-to-speech output). In a different study, Qiu and Benbasat (2010) further showed that an anthropomorphic RA that matched the ethnicity of their users were perceived as more sociable, enjoyable, and useful than were an ethnicity-mismatched RA. In their investigation of how social technology cues, media capabilities, and individual difference influence perceived social presence of and trust in an RA, Hess et al. (2009) found that an RA exhibiting a more extraverted personality (manifest in the RA's word choice or physical gestures) or with a greater level of vividness (e.g., human animation with voice and text) led to higher perceived social presence and trusting beliefs than did an RA exhibiting a more introverted personality or with a lower level of vividness (e.g., text or voice).

While not evaluating users' perception of social presence, a few studies have demonstrated the potential to manifest social attributes in RAs and examined the effects of such attributes on other technology related perceptions. For instance, focusing on two types of perceived similarity—perceived personality similarity and perceived behavioral similarity—between an RA and its users, Al-Natour et al. (2006) investigated how two design characteristics—the dominance personality of the RA (manifest in the use of suggestive guidance, the use of directives, and the expression of higher confidence levels) and the decision-making strategy (manifest in the use of additive compensatory strategy or elimination by aspect strategy) of an RA—drive a user's perception of these similarities. The results of their experimental study revealed that a user's perceptions of the RA's personality (decision strategy) and her own personality (decision strategy) interacted to affect her perceived personality similarity to the RA. In a related study, Al-Natour et al. (2008) showed that perceived decision process similarity (i.e., users' perceptions of the similarity between their own decision process and that followed by the RA to arrive at a recommendation) and perceived decision outcome similarity (i.e., the

similarity between the recommendations made by the RA and users' initial choices) exerted significant positive impact on users' perception of the RA's usefulness and trustworthiness. In a similar vein, Huang and Kao (2011) found that perceived decision process similarly (manifest in the provision of *how* explanations) and perceived decision outcome similarity (manifest in the provision of *why* explanations) between the RA and its users indirectly influenced the users' reuse intention via perceived information diagnosticity. Exploring the personalities spokes-avatars (rather than textual RAs) in brand communication, Jin and Sung (2009) showed that an anthropomorphic RA with sincere/competent personalities (i.e., an RA designed to look honest, competent, expert, and wholesome), compared to an RA without such personalities, led to higher perception of trustworthiness and expertise, more positive brand attitude, and higher shopping intention. Lui and Hui (2010) also found that male (smiling) RAs were perceived by consumers to be more competent than were female (non-smiling) RAs.

3 Conclusion

In this chapter, we have provided a review of empirical studies on the use, characteristics, and impact of e-commerce product RAs that were published between 2006 and 2012. We have observed in this review exercise that, with a few exceptions (e.g., Hostler et al. 2012, which examined the role of RA in improving search effectives; Wang and Benbasat 2012, which explored the effect of user control during preference elicitation on decision effort and perception of RA quality), the majority of the reviewed studies extend, rather than testing, the conceptual model (see Fig. 1) and the supporting propositions (see Table 1) advanced in our MISQ 2007 paper, by introducing other RA characteristics (e.g., other RA types and input/output characteristics), user perception variables (e.g., perceived recommendation quality, enjoyment, perceived social presence, perceived trade-off difficulty), and moderating factors (e.g., regulatory focus, gender, temporal distance, reactance level, decision context, etc.).

In this chapter, we have also highlighted four topic areas in which considerable research has been conducted: RA type, preference-elicitation (an input characteristic), explanation (an input/out characteristic), and the social aspects of RAs. Whereas the first three topic areas can be considered an extension of our original conceptual model, the social design of RAs and their social impact (e.g., perceived social presence) present themselves as a fresh dimension absent in the original model. To reflect the rising academic interest in the social aspects of RAs, we update our original conceptual model by (1) distinguishing between functional RA characteristics and social RA characteristics and (2) incorporating *social presence* in User Evaluation of RA (see Fig. 2). We have also removed the lower-level content for the factors related to user, user-RA interaction, and product so that the conceptual model can provide a more generic framework guiding future research.

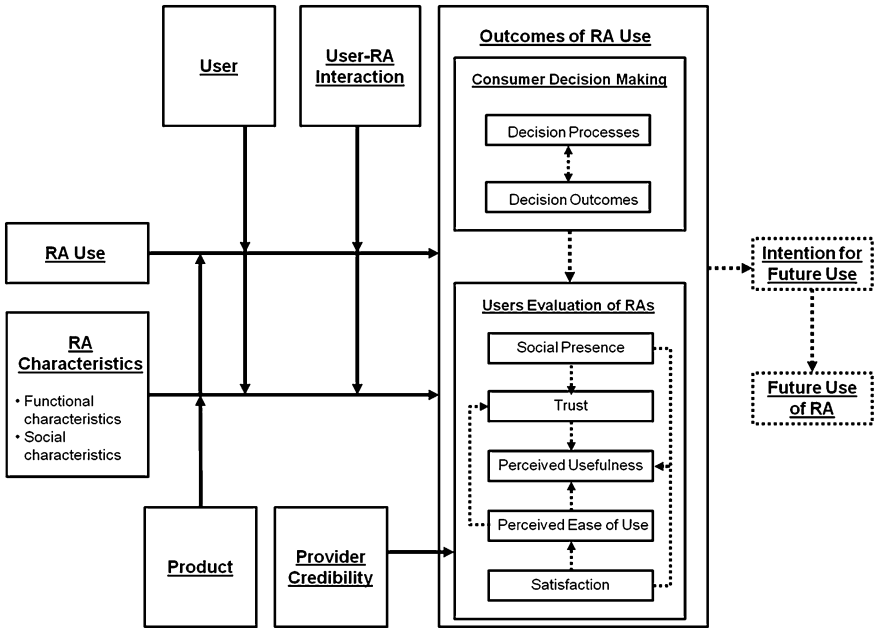

Fig. 2 Updated conceptual model

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An Evolutionary Approach to e-Tailing: Implications for Practitioners

David E. Williams

Abstract An evolutionary lens captures and assess e-tailing's historical and projected future evolution. This uncovered a four stage evolutionary pattern that is used to offer insights into e-tailing's past and future strategic development and its implications for practitioners.

Keywords E-tailing · E-commere · Evolution

1 Introduction

This chapter provides a historically grounded understanding into the dynamic of change in e-tailing. It applies the wider, and retailing focused literature on evolutionary change, especially Davies's (1998) work to the development of e-tailing. This evolutionary template is used to capture and demonstrate how e-tailing has evolved and will continue to evolve in the future. This is important as retail institutions have received scant conceptualization or consideration (Levy et al. 2005), e-tailing needs more theoretical insights (Grewal et al. 2004) and evidence suggests traditional retail theories are applicable to e-tailing (Chebat and Babin 2008). Therefore, as research on e-tailing steadily matures (Grewal and Levy 2007); it is time to consider theory building and its process of development.

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E-tailing's development intersects the theories of industry change and technological change and there is a lack of work dealing with the co-evolution of these areas (McGahan 2004). As a central path between fragmented theories and 'paradigmatic orthodoxy' (Stoelhorst 2008: 1022), the evolutionary approach will permit the assimilation of findings from various fields.

The evolutionary approach is rarely used in marketing (Michael and Kim 2005) and whilst limited knowledge exists on the evolution of retailing in general, in e-tailing it is virtually non-existent. Therefore, a need exists to study the dynamics of evolution in retailing, especially e-tailing. Analysis of e-tailing's development invariably focuses on Amazon (Kotha 1998; Mellahi and Johnson 2000), however the practice of only examining the largest firms produces an incomplete analytical framework (Carroll 1985). Studies encompassing a wider sphere of analysis are needed, 'to capture the process of transformation' as a narrow focus, 'may miss some essential properties of the pattern of industry evolution' (Malerba and Orsenigo 1996: 82). Therefore, this chapter attempts to find if a 'discernable pattern of industry evolution' (Quinn and Sparks 2007: 408) exists in e-tailing.

Initially retail innovations, including e-tailing are often myopically labeled as "revolutionary." In this current era, "Technology is revolutionizing the way people shop." (Wenig 2012); tablet computers, especially the iPad are predicted to 'revolutionize the retail industry' (Zmuda 2010); the 'mobile revolution is here.' (Cain Miller 2013); the social media enabled revolution (Monty 2012) is under way; and, e-commerce in entering a 'radical transition' (Gaudin 2011). Social networking, brand communities, user-generated content, open systems and collaboration means the Internet is currently in an 'even more revolutionary phase.' (Hamill et al. 2010: 181) that could "radically re-configure the underlying processes of retailing." (Dohert and Ellis-Chadwick 2010: 375). In addition, the term "evolution" is often casually used, in the absence of a theoretical basis to passively describe or categorize the development of retail innovations. In the business press, the Web has evolved from Web 1.0 to Web 2.0 (O'Reilly 2005) with little theoretical underpinning to categorize or analyze this development. Consequently, this chapter will not merely provide a chronological itemized narrative of e-tailing's development, but strives to understand the workings of the evolutionary process in e-tailing reveal meaningful implications for practitioners.

1.1 The Continued Evolution of e-Tailing

E-tailing is dynamic and continues to evolve. It is rooted in technology and as technology changes it triggers major industry changes (Dosi et al. 1997). Since Williams' (2009) work on the evolution of e-tailing, it has developed to include social media, "…a big-picture, interdisciplinary concept that covers an evolving set of digital methods through which stakeholders interact. These methods can become major marketing channels, customer-service delivery channels, and new ways of gathering intelligence." (Madison 2012). This, "new Web empowers

people, 'tribes' communities and networks." (Hamill et al. 2010: 182). The rapid growth and acceptance of social media has created the potential for social commerce and social shopping (Stephen and Toubia 2010) to empowered consumers through social media-enabled and commercially-driven brand communities (Muniz and O'Guinn 2001; Kozinets et al. 2008; Zaglia 2013). 'Social commerce and social shopping are forms of Internet-based "social media" that allow people to participate in the marketing and selling of products in on-line marketplaces and communities.' (Stephen and Toubia 2010: 215). The interactive and social Web 2.0 has transformed how firms and customers connect, how customers link with other customers and created the potential for co-creation (Etgar 2008) in an on-line bonding community (Kozinets 2010).

The Internet's open and collaborative nature (Chatterjee 2002) means an e-tailer's collective network or 'open system' (Chesbrough 2011) now legitimately includes empowered consumers in a brand community (Kozinets et al. 2008) and e-tailers are 'networked firm-facing actors in brand-centered communities.' (Schau et al. 2009: 31). This facilitates a macro-level value-creating activity system defined as '… a set of interdependent organizational activities centered on a focal firm, including those conducted by the focal firm, its partners, its vendors or customers, etc.' (Zott and Amit 2010: 217) involving customization and co-creation.

The potential for social commerce involving customization and co-creation within brand communities is being enabled and driven by social data and "big data." The ability to leverage this 'big data' means 'data equity' may become as important as brand equity (The Economist 2011). As an 'infomediary' (Sharma and Sheth 2004), Amazon uses big data to continually dominate the Big Middle (Levy et al. 2005) as the 'Wal-Mart of the Web' (Anonymous 2011) and it may eventually challenge Wal-Mart as the foremost low cost retailer (Belsie 2010).

E-tailing is being seamlessly integrated into multichannel retailing; e-shopping on mobile devices is predicted to grow (Cain Miller 2013) making e-tail purchases more impulsive; catalogue like shopping apps will further enhance the e-shopping experience on tablet computers (Clifford and Cain Miller 2011) and, 'device-hopping shoppers' (Cain Miller and Clifford 2012) will jump from smart phones, tablets and laptop computers. All of these retail touch points are ultimately expected to synchronize into Rigby's (2011) 'omnichannel' of a seamless and connected retail experience (Wenig 2012).

New Internet business models are needed to account for this new and rapidly changing nature of Internet and social relations (Wirtz et al. 2010). Nevertheless, Williams' (2009) four phase evolutionary framework grounded in the conceptualizations of evolutionary change can accommodate these 'transformative' developments and provide timely and invaluable practitioner insights as e-tailing enters another 'revolutionary' phase.

To generate meaningful insights, research needs to adopt an interdisciplinary approach and retail academics must look outside their discipline and critically 'cross-borrow' theoretical developments (McGahan 2004; Aldrich and Ruef 2006). The evolutionary approach, based upon a multi-disciplined perspective (Quinn and Murray 2005) is adopted to produce a more holistic explanation of

e-tailing's development. Most evolutionary work is based on manufacturing industries with a narrow technological slant, creating a need to expand these to service industries, such as retailing where the process of evolution may differ (Quinn and Sparks 2007).

1.2 Background

Practicing retailers need to be aware of the gaps between theory and practice (Bruce et al. 2009) and the evolutionary perspective is not the dominant or traditional theoretical approach of management research and education. Therefore, application of the evolutionary perspective to e-tailing will stress the usefulness of this perspective to practitioners and provide them with a road map on the future development of e-tailing. Specifically, it seeks to help guide retailers, who must continually grapple with the changes taking place in this dynamic area, to understand the evolution of e-tailing and its future development and how to assess and confront other future retailing "revolutions" that they will face. By developing a basis upon which one can classify the evolution of e-tailing following a predictable cycle of events, it will help retail firms identify their position and identify appropriate future courses of strategic action. 'The past informs the present.' (Alexander 1997: 383) and to make effective strategic decisions in the future, retailers need to consult their past experiences.

This chapter starts by briefly establishing the current state of knowledge on evolutionary change. It then considers the evolutionary perspective within retailing with a specific emphasis on Davies's (1998) work. This knowledge is then applied to the development of e-tailing and uncovers four distinct phases. Finally, detailed implications for practitioners on e-tailing's past and projected evolution are offered.

2 Evolutionary Change

Most situations, levels and specific frameworks on evolutionary change can be explained within the four evolutionary mechanisms of variation, selection, retention and the struggle for scarce resources (Campbell 1969; Aldrich and Ruef 2006). A relationship exists between the dynamics of an industry and the rate of technological change (Malerba and Orsenigo 1996) and technological change is widely viewed as the major cause of industry changes (Christensen 1997; Dosi et al. 1997; Christensen and Raynor 2003).

There are numerous specific and interdependent frameworks of how industries evolve and change over time. These include change trajectories (McGahan 2004); punctuated equilibrium theory (Romanelli and Tushman 1994; Tushman and

Anderson 1986; Hunt and Aldrich 1998); disruptive innovation (Bower and Christensen 1995; Christensen and Raynor 2003); life cycle approaches, such as the industry life cycle (Klepper 1997; Agarwal and Bayus 2004), the reverse product cycle (Barras 1986); the density dependence approach (Hannan and Freeman 1989; Carroll 1997); ecological approaches, such as Carroll's (1985) resource-partitioning model; technological regimes (Audretsch 1997); and, a community ecology perspective (Freeman and Audia 2006). Williams (2009: 220–223) provides a thorough review of these approaches and their applicability to e-tailing.

3 Evolutionary Change in Retailing

A broader and longer term evolutionary perspective views retail innovations as continuous evolutions dispersed by brief periods of revolution (Davies 1998). In retailing, the term "revolution" is used frequently and loosely to excitedly welcome various innovative formats, operational procedures and industry changes. Retailing has undergone so-called revolutions in home shopping (Cunningham and Cunningham 1973), discount retailing (Burt and Sparks 1995), grocery retailing (Keh and Park 1997) and distribution systems (Thornton 1994). In addition, Wal-Mart is credited with revolutionizing discount retailing and category killers with revolutionizing various retail sectors. The business to consumer dimension (B2C) of e-commerce, commonly referred to as e-tailing was part of the hyped "e-revolution." It has also participated in the Internet (Mahajan et al. 2002), virtual (Hoffman and Novak 1996), distribution (Alba et al. 1997), new industrial (Rosen and Howard 2000) social networking (Schwartz 2007) revolutions. E-tailing is an integral part of the tablet computer (Zmuda 2010) and mobile shopping (Cain Miller 2013) revolutions and the Internet itself is now in an 'even more revolutionary phase' (Hamill et al. 2010: 181).

Similarly, the term "evolution" is often used to describe how retail innovations and formats have changed over time, such as on-line banking (Singer et al. 2005), factory outlets (Fernie 1996), factory outlet tenants (Jones 2007), retail parks (Thomas et al. 2006), power centres (Hahn 2000) and the WWW (O'Reilly 2005). Taylor and Strutton (2010: 950) observed that, "E-marketing evolved from a comparatively isolated group of "dot-com" firms to a mainstream marketing channel activity." However, evolution is also a theoretical lens to analyze the pattern of development in various areas of distribution and retailing, such as wholesaling (Quinn and Murray 2005; Quinn and Sparks 2007).

From the primitive mail order magazines of the 1870s (Keep and Hollander 1992) to futuristic e-tailing scenarios (Alba et al. 1997), non-store retailing innovations, especially home-shopping formats, have continually evolved incrementally following a natural progression or combination of existing non-store

formats. The original forms continued to exist and were integrated with subsequent innovations. Apparent failures were unrefined versions and learning experiences for subsequent developments.

There is fragmented antidotal evidence of an evolutionary approach to retail developments. Retailers have been seen as reluctant revolutionaries (Brown 1990) and retailing has been depicted as an evolving industry. "While much is talked about a 'retail revolution,' there is in reality little evidence of either major paradigm shifts or of change of a revolutionary nature." (Dawson 2000: 142). In channel research, Shaw and Dawson (1996) advocated an evolutionary approach as partial approaches prevented an understanding of the way in which channels evolved over time. Over a century, evolution over revolution is the most important lesson Marks and Spencer has learnt (Davies 1999). Recent history, Dawson (2001) felt indicated a low degree of innovation had occurred in European retailing and that changes stemming from the major innovations, such as self-service and the adoption of marketing by retailers, had been mostly evolutionary. However, he observed that the processes, pace and intricacies of change and innovation have accelerated and that, "There is now more innovative and radical behavior apparent from all the participants in commerce." (Dawson 2001: 288). In strategy formulation, academic research has not answered the question if an evolutionary or revolutionary approach prevails in e-tailing (Doherty and Ellis-Chadwick 2006) and Reynolds et al. (2007) referred to the 'incremental evolution' of retail formats that emerge in an opportunistic and intuitive fashion and were continuous in nature. Bruce et al. (2009) used the evolutionary perspective to metaphorically describe multichannel retailing and concluded it was making an 'evolutionary leap' into its second phase.

Classic frameworks of retail change and development such as the 'Wheel of Retailing' (McNair 1958; Hollander 1960), the 'retail accordion' (Hollander 1966) and the retail life cycle (Davidson et al. 1976) and integrative combination models that use multi-modal approaches (Brown 1987) are underpinned by an evolutionary perspective. They involve repetitive, continuous cyclical patterns or spirals of how retail institutions change over time. Massad et al. (2011) found, 'eBay sellers evolve in a pattern consistent with the Wheel of Retailing.' In the past century, Christensen and Tedlow (2000) felt retailing had experienced four disruptive patterns consisting of departments stores, mail order catalogues, discount stores and e-tailing. These disruptions shared common characteristics, similar evolutionary patterns and transformed the industry. Recently, the concept of the "Big Middle" (Levy et al. 2005) has been introduced and although it may be static with only the competitors changing, it too may be underpinned by a cyclical evolutionary pattern. In U.S. general merchandise retailing, Brown et al. (2005) identified three historical Big Middles or sub periods consisting of the variety store, department store and discounter. E-tailing's recent pattern of evolution may imitate the growth pattern of physical stores (Massad et al. 2011).

So-called revolutionary changes may be a natural progression of emerging trends or the diffusion of existing retailing know-how, technology, processes and concepts to other retailing sectors and countries. If recipient countries are at a markedly different stage of economic development, these transfers may have a

short-term 'revolutionary' impact as changes are shaped by local influences (Davies 1998). An evolutionary approach underpins Friedel's (2007) historical analysis that technological innovations are the result of small changes to current technologies occurring within a culture of continuous improvement.

An individual retailer's development and execution of its e-tailing strategy has been classified into various evolutionary phases with each successive phase reflecting increasing levels of resources and commitment. This "staged evolutionary approach" (Ashworth et al. 2006: 292) may include three (Poon and Swatman 1997; Bickerton et al. 2001), four (Van Doren et al. 2000) or five stages (Ashworth et al. 2006).

3.1 Davies's Work on Evolutionary Approaches to Retail Developments

Davies (1998: 178), "…outlined some current evolutionary theory and attempted to show how this theory can be applied to retailing to overcome a number of problems associated with existing theories of retail change." Davies's (1998) work is outlined below and in the next section it is applied to e-tailing to explain its evolution. As most evolutionary work focused on manufacturing industries (Quinn and Sparks 2007), Quinn and Murray (2005: 8) viewed Davies's (1998) efforts as, 'A rare attempt to utilize evolutionary thinking within marketing channels.'

Davies (1998) viewed technology (such as computing technology) that has the potential to have a major impact on consumers and retailers occurring at the macro-level in the 'design space.' Davies (1998: 169) defines the design space as, "…the space within which retailing operates and which offers opportunities for, or constraints on new developments." At the micro-level, retail forms (such as e-tailing and other non-store and store-based retailing formats) adapt to reflect these broader changes, which are also moderated by differing local influences, such as cultural and economic variations. The force driving change at the macro-level is unpredictable but the pattern of reactions by retail forms at the micro-level is regular and cyclical. At the micro-level, there is not a cyclical repetition of one mechanism, such as low price/trading up in the Wheel of Retailing (McNair 1958) or merchandise assortment in the retail accordion (Hollander 1966), but predictable cycles of decisions in response to unpredictable macro-level environmental forces.

In the design space, two types of firms and strategies, based upon Hannan and Freeman's (1989) r and k strategies are possible (Davies 1998). R-strategists are opportunistic and prevail when change is fast and discontinuous. They adopt many new experimental formats that quickly exploit change and define the new design space. The larger K-strategists, are slow at dealing or exploiting change and exist when change is gradual and foreseeable. They have strong odds of survival despite facing strong competition.

There may appear to be a ceaseless number of random possibilities concerning the future of e-tailing. However in practice, only a few actual outcomes may exist as, 'evolution is constrained by context.' (Davies 1998: 173). In summarizing his work, Davies (1998) felt the design space was ripe for some mode of disorder or discontinuity and the most likely driving force was changes in communication technology at the macro-level allowing e-tailing to occur at the micro-level.

Davies (1998) showed the evolutionary approach can accommodate evolutionary and revolutionary views of innovative retailing developments when long periods of steady evolution in a static environment are interrupted by shorter intense periods of 'revolution.' At such moments, new innovative formats (such as e-tailing) rapidly develop and adopt their function and form. These 'revolutionary' changes are characterized by upheaval, rapid and discontinuous change, before retailing again enters another long period of stabilization. In this calmer period, patterns of evolutionary development are slower and more predictable consisting of many small incremental changes occurring over a long time. This causes big differences between the current and initial versions of the retail innovation, before the environment is interrupted again by another short period of revolution (Dreesman 1968; Davies 1998).

The dot.com crash in 2000 was perhaps a defining moment in e-tailing's 'revolutionary' period, meaning e-tailing has entered a longer period of stabilization which provides a firmer footing from which to assess its future development and impact.

4 Evolutionary Change in e-Tailing

Evolutionary analysis must be grounded in a historical context (Aldrich and Ruef 2006) and if retailers know their history, they can predict and anticipate their future (Rinehart and Zizzo 1994). When studying the actions of retailers, it is important to understand the conditions which preceded the moment of the decision and to, "achieve an understanding of the substance rather than the froth of historical detail." (Alexander 1997: 398). Savitt (1982) viewed the historical process as comprised of the description of an event; the narration of a sequence of events; the analysis or explanation of their relationships; and the synthesis or interpretation of such relationships. The first two steps of this process, the past and anticipated future pattern of development of e-tailing at the micro-level of the design space, is developed and described in the next section within the context of Davies's (1998) work on evolutionary change in retailing to establish the process of change. However, as "…the sequential description of events is not in itself historical analysis and far more emphasis should be placed on other aspects of the process" (Alexander 1997: 388) the latter two steps of Savitt's (1982) approach are comprehensively addressed in the theoretical ties section of Williams' (2009: 230–238) paper and the subsequent practical implications in this chapter.

Utilizing Davies's (1998) evolutionary ideas to the discipline of retailing, I have classified the past and continued evolution of e-tailing into four stages which are captured in Table 1. The analysis is based on e-tailing that is Internet-based using Levy and Weitz's (2001: 79) definition of: "A retail format in which the retailer and customer communicate with each other through an interactive electronic network." The continuous nature of evolutionary development means it is difficult to identify 'fixed points of stability for analysis' (Reynolds et al. 2007: 652), although the dot.com bust was a defining moment in e-commerce and e-tailing. Therefore, it is hard to put precise dates on the start and end of each period; I have used key sequential events to signal a change has occurred. It is important to note that the time categorization is approximate and contains a degree of overlap.

Friedel (2007) observes that technological innovations are born out of a 'culture of continuous improvement.' In e-tailing, there were many early technological prototypes and commercial ventures offering interactive computer-based shopping. The Teletext and Viewdata systems had limited interactivity with little opportunity for e-tailing (Sharma et al. 1983; Urbany and Talarzyk 1983). However, the exclusion of early prototype technologies and firms' pre-entry experience which affects their existence in new industries (Klepper 2004) may represent a left-truncation of e-tailing's evolution (Aldrich and Ruef 2006).

4.1 Stage One: Hype and Experimentation

When web-based e-tailing emerged, change was rapid and erratic as entrepreneurial e-tail pioneers, some well financed, pursued an opportunistic strategy using many mixes of technology and novel formats. These included: clumsy on-line malls, mega stores such as Shopping.com; specialist sites such as Amazon, and CDNow; the almost indistinguishable shopping agents, for example NetBot; and, sites for price comparisons, buying guides, buyers' clubs, event planning (weddings and parties), urban delivery, and brokerage and auctions. They had no assurance of survival as witnessed by the failure of Confetti.com, Tietheknot.com, Evites, Garden.com, Kozmo.com Petopia, Pets.com and Boo.com. There was a high start-up rate to counteract the high mortality rate; for example, 500 e-retailers failed during 2000–2001 (Casey and Carroll 2004). In short,

> Early e-retailers blazing the way were "dot-coms", discrete entities unfettered by brick-and-mortar stores. Internet marketers were viewed as part of the e-commerce world, distinct from their Old Economy brethren. (Taylor and Strutton 2010: 950).

In accordance with Davies (1998), these early pioneers pursued an R-strategy (Hannan and Freeman 1989) and helped define the emerging design space by quickly exploiting transient opportunities using different formats in different markets but they were weak at dealing with larger competitors. They had poor business models built around a weak consumer value proposition that had little chance of ever generating a profit. For example, Letsbuyit where individual

Table 1 The stages of e-tailing's evolution

	Stage 1	Stage 2	Stage 3	Stage 4
Stage:	Hype and experimentation	Retrenchment and sobriety	Sustainability	Focus and fragmentation
Davies's (1997) micro-level design space features	Rapid and erratic change	Slower and more predictable change	Stability emerges with predictable cyclical patterns of differentiation by low prices or specialization	Continued cycle of differentiation by low prices or specialization
Key features	• E-tailing's 'revolution'—the Wild Wide Web • Entrepreneurial pioneers pursue ambitious and undisciplined expansion with a high failure and start up rate • Opportunistic experimentation with many novel formats that defines e-tailing's basic function and form	• Early e-tail pioneers forced to adapt or die. Surviving best of breed specialists adapt and increase their odds of survival and a few become successful settlers • Physical store retailers are in acknowledgement and adaptation. These eventual market leaders enter from other sectors and channels using various modes of entry: direct, acquisition, alliance and clicks n' bricks	• Consolidation • Focus strategy through cost leadership or differentiation	• Increased business efficiencies increases ability to offer lower prices • Integrated multichannel systems and touchpoints in an omnichannel • Mass customization and hyper targeting facilitates personalization
	• Physical store retailers fear being 'Amazoned'—are in shock and denial	• They drive down costs by operating efficiently and improve the respectability and acceptability of e-tailing		• Infomedaries and co-option via alliances, marketing relationships, in an open system, value creating network with cross retail collaborations. • Opportunities for backwards evolution • Physical stores still dominate • Customer-to customer presumption and co-shopping • Empowered customers in Facebook-enabled commercially-oriented brand communities

consumers grouped together to secure discounts, except too few people signed up, discounts were unimpressive, margins were slim and bulk buying advantages went to consumers not shareholders (Anonymous 2001). These early e-tailers spend $26 on marketing and advertising per order, compared with $2.50 by physical retailers (Rosen and Howard 2000). Pets.com and E-toys spend an astounding $460 and $37 respectively on advertising for every $100 in sales, compared to the 3–5 % of sales typically spend by store-based retailers (Kelly 2000; Tapscott et al. 2000). In retrospect, Rigby (2011: 4) succinctly described this era as:

> Like most disruptions, digital retail technology got off to a shaky start. A bevy of internet-based retailers in the 1990 – Amazon.com, Pets.com, and pretty much everythingelse.com – embraced what they called online shopping or electronic commerce. These fledgling companies ran wild until a combination of ill-conceived strategies, speculative gambles, and a slowing economy burst the dot-com bubble. The ensuing collapse wiped out half of all e-commerce retailers and provoked an abrupt shift from irrational exuberance to economic reality.

4.2 Stage Two: Retrenchment and Sobriety

Davies (1998) observed that as change slows and becomes more predictable, Hannan and Freeman's (1989) K-strategy predominates. This occurs when larger firms and formats establish good market coverage and increase their odds of survival but become slow at coping or taking advantage of change. As these successful formats begin to emerge, eventual market leaders enter and drive down costs by operating efficiently.

In e-tailing, these were mostly the leaders from other retailing sectors and channels, primarily catalogue and store-based retailers who entered e-tailing directly (such as, Tesco, J.C. Penney, Office Depot, Lands' End, The Gap, L.L. Bean, The Limited and QVC), by acquisition (such as Bertelsmann buying CDNow, and CWP buying Drugstore.com) and by forging an alliance with an early e-tailing pioneer (such as Toys"R"Us and Amazon.). BMG Music used many experimental probes including branded web sites, strategic alliances and joint ventures with Napster, AOL and Universal (Martin and Eisenhardt 2004).

Some early e-tail pioneers went under, for example, Garden.com Mothernature.com, Furniture.com, Petopia Stamps.com, Eve.com and Living.room.com. A few adjusted their (r-)strategies to become successful settlers, such as the 'best-of-breed' specialists like Amazon and eBay. These e-tailers did not offer lower prices per se but their skill at adjusting to market conditions may offer customers lower prices (Davies 1998). The dot.com crash in 2000 was a watershed moment in e-tailing's evolution signifying the end of the aftershocks of e-tailing's 'revolutionary' period before it entered a longer period of stabilization. This juncture was described as:

> Despite the internet's apparent commercial potential, when the "dot-com bubble" burst in 2001, many of the electronic marketplace's pioneers were driven into insolvency due to their unrealistic business models. Electronic commerce is now enjoying a second period of significant – and probably more sustainable – growth, but it now tends to be the established retailers rather than the "pure-plays" who are likely to play the more dominant role. (Doherty and Ellis-Chadwick 2009: 1247).

In Davies's (1998) paper, the evolutionary process continues however, I feel the prolonged stability in the design space created a third stage of sustainability.

4.3 Stage Three: Sustainability

Slower environmental changes and design space stability means cyclical patterns are likely to ensue. The competitive basis between the new leading firms, primarily "clicks and bricks" retailers, is a focus strategy based on significant market segments through cost leadership reflected in lower prices, or differentiation resulting in higher prices, both of which are moderated by local market conditions (Davies 1998).

The cost leadership approach is typified by the practices of netmarket.com, overstock.com, bluefly.com and comparison sites, such as mysimon.com whereas the differentiation approach involved e-tailers offering a low width and high depth product mix such as, SmarterKids.com (educational toys), Omahasteaks.com (steaks), Eyestorm.com (contemporary art and photography), Rei.com (recreational equipment), Reflect.com (customized beauty products) and those offering very specialized offerings, such as handlo.com (choral music).

4.4 Stage Four: Focus and Fragmentation

The latter stages of Davies's (1998) paper postulate a continual cycle of differentiation through increased specialization or lower prices. Indeed:

> …the Internet has provided retailers with a highly effective mechanism for: broadening target markets, improving customer communications, extending product lines, improving cost efficiency, enhancing customer relationships and delivering customised offers. (Doherty and Ellis-Chadwick 2010: 375).

E-tailers may possess markedly less sources of competitive differentiation compared to traditional physical retailers (Mitra and Fay 2010) but these two sources are extremely formidable.

The predicted fragmentation of stage four will be hastened by the social web and social commerce (Stephen and Toubia 2010) using predictive personalization (JWT 2012) and co-creation (Etgar 2008) to consumers in commercially- driven and accepting (Muniz and O'Guinn 2001) Facebook-enabled brand communities (Zaglia 2013).

E-tailing has long facilitated personalized data collection, and this is now further empowered by big data as it creates ever increasing possibilities for increased precision in segmentation and targeting and real time customization. Viewed as a process innovation, it allows large retailers to improve their 'business efficiencies' (Burt and Sparks 2003) which increases their ability to offer lower prices. Facebook is an 'information aggregator' (Zwass 2010) and its biggest competitive advantage of being one all-inclusive big database (Moglen 2010) of unique social data makes it a "brand relationship machine" (Elowitz 2102). Facebook's continual evolution into a content platform with the ability to customize content will further accelerate this as it becomes a, "hyper accurate always up-to-date marketing database."(Grant 2012). Therefore, as networked firms predominate and become branded infomediaries (Sharma and Sheth 2004) that, "…organize consumer communities, and aggregate consumer information and demand into saleable business assets." (Achrol and Kotler 1999: 146) knowledge or 'social intelligence' (Armano 2011) will be a core competency.

Consumers will also become more price savvy as the Internet will continue to allow customers easy access to pricing information (Grewal et al. 2004). Under Anderson's (2006) *Long Tail* markets are predicted to splinter into a myriad of niches and Ashworth et al. (2006) referred to 'micrologues' personalized to individual customers. A few retailers have used e-tailing to customize a few products on a limited number of options. The defunct Reflect.com sold customized cosmetics, Dell's business model enables customers to order custom-built PCs directly from the company and e-tailers, such as Zappos permit buyers to customize their web pages.

The network nature of e-tailing, the need to reach a critical mass and to seamlessly integrate various business functions, dictates the development of business partnerships or marketing alliances, the opening of propriety systems, or Chatterjee's (2002: 715) *co-opetition* to reduce costs and to deepen product offerings. Indeed, Venkatraman (2000) felt internet businesses were 'network-centric' necessitating a 'portfolio of relationships' and Katros (2000: 80) referred to the trend of ubiquitous retailing when 'retailers and non-retailers are partnering with anyone and everyone who comes in contact with a customer.' Similarly, "asset-light" hotel chains operate on a 'virtual' model based upon a network of outsourcing, franchising and management contracts (Anonymous 2009a). Under Shopatron's system, manufacturers receive customer orders at their branded websites which are then allocated to the retailer closest to the consumer who has the product in stock. Retailers then ship the product or the customer or they come to the store for same-day pick-up. Amazon provides a vast product selection and fast delivery at low prices operationalized by its strong and trusted brand identity, personalized recommendations, many strategic alliances and affiliate marketing program with third party e-tailers; who account for 30 % of all items sold through Amazon (Anonymous 2008). It is the 'Wal-Mart of the web' (Anonymous 2011) and may replace Wal-Mart as a price leader (Belsie 2010). E-Bay is a virtual network of buyers and sellers offering both competitively and increasingly fixed

priced mass market products combined with a wide breadth and depth of niche products and Esty is an online marketplace and community for buying and selling handmade products.

Improved behaviourial or 'hyper targeting' and technology-enabled collaboration between retailers will make mass customization possible which increases the relevancy of an e-tailers' offerings and forms the bedrock of enduring customer relationships (Ansari and Mela 2003). It strengthens e-tailer loyalty by enhancing brand associations, creating switching costs and a customer 'ownership' effect (Ansari and Mela 2003; Franke et al. 2010). Customization ranges from mass customization to personalization to co-creation to presumption. In presumption 'lead users' self- create and produce products and services with no or little firm involvement for the same people who will ultimately use them (Tapscott and Williams 2006). In co-creation the customer participates at the very start and in mass customization the most common approach, at the very end (Kristensson et al. 2008).

The Internet has the potential to enable multi-seller or "cross retail" collaborations that outwardly deliver the mass customization of bundles of products and services (Grenci and Watts 2007). Amazon has forged alliances and uses its technology to offer 'personalized offerings' to the extent that it has been viewed as an 'infomediary' (Sharma and Sheth 2004). It lets other retailers use its logistics and distribution services and has opened up its system and tools to external website developers (Kirby and Stewart 2007; Manyika et al. 2007).

Web 2.0 and social media tools means the Internet is mow a network of customers interacting with each other and social-networking sites are developing their e-tailing function to become virtual gateways or distribution mechanisms. This allows individual firms to provide products and services to niche markets or 'micro-communities' through branded channels (Kirkpatrick 2007) in a virtual community (Hagel and Armstrong 1997). Creating a community is vital for e-tailers (Sharma and Sheth 2004) and Facebook-based, company-organized and commercially-oriented brand communities have developed (Zaglia 2013). Social networking sites unite social interactions revolving around shared personal interests to create suitable e-shopping in a brand community (Dennis et al. 2009). Brand communities may trigger 'co-shopping' (Chan and Li 2010: 1035) when, "a consumer group who coordinates to purchase together in larger quantities at lower costs or collaborates to access certain products, which they purchase for those who lack such access because of regional or membership constraints."

Brand communities are the most commercially-driven and accepting (Muniz and O'Guinn 2001) of on-line communities and are an "anchoring place" (Aubert-Gamet and Cova 1999) where *Insiders* are deeply connected with the consumption activity and seek engagement and a sense of community in an on-line *bonding* community (Kozinets 1999, 2010). Social media means these empowered consumers 'co-own' and 'co-direct' a brand's competitive strategy (Heil et al. 2010). Retailers and brand communities are embedded in third party social media platforms, consumers are co-creating products and offering them for sale on e-tail sites.

Prolonged stability produces more fragmentation in response to further competitive strikes on surviving niches and more standardized use of e-tailing, as settled firms are less responsive to major upheavals and will seek the slightest competitive advantage (Davies 1998).

5 Theoretical Ties

The similarities and applicability of the evolutionary forces and specific evolutionary approaches on e-tailing's evolution are summarized in Table 2.

Table 2 shows e-tailing's evolutionary development is grounded in and has similarities with the evolutionary mechanisms (Campbell 1969) and various evolutionary frameworks. These include evolutionary trajectories (McGahan 2004), patterns of innovation evolution (Barras 1986; Tushman and Anderson 1986; Bower and Christensen 1995; Burt and Sparks 2003; Christensen 1997), punctuated equilibrium theory (Romanelli and Tushman 1994), the reverse life cycle (Barras 1986), the industry life cycle (Klepper 1997), and the density dependence approach (Carroll 1997; Hannan 1997; Hannan and Freeman 1989). Williams (2009: 230–238) provides a complete analysis of these evolutionary mechanisms and frameworks to the proposed four stage evolutionary process.

6 Practical Implications of the Stages of e-Tailing Evolution

This section outlines the practitioner implications of e-tailing's four phase evolutionary pattern of development.

6.1 Stage One

The pioneering cognitive frame of the early entrepreneurs (Szulanski et al. 2004) and the intense period of technological ferment quickly lead to the establishment and spread of e-tailing's dominant design (Tushman and Anderson 1986). However, survival in e-was not necessarily related to being involved in its creation as the early pioneering *Creator* e-tailers (Agarwal and Bayus 2004) did not necessarily have higher survival rates. This is possibly because, unlike other industries there was little competitive space (Agarwal and Bayus 2004) with the initial frenetic entry into e-tailing (Varadarajan et al. 2008).

Venkatraman (2000) called for coordinated experimentation and Murray and Tripsas (2004) advocated structured 'purposeful entrepreneurial experimentation'

Table 2 Similarities and overlap between e-tailing's evolution and various evolutionary perspectives

	Stage 1	Stage 2	Stage 3	Stage 4
Theoretical approach	Hype and experimentation	Retrenchment and sobriety	Sustainability	Focus and fragmentation
Generic evolutionary processes (Aldrich and Ruef 2006)	E-tailing, a novel routine is introduced by new organizational forms causing variation. Legitimation occurs as desirable routines are selected	Retention occurs as the dominant design is replicated and variation is diffused. Populations blend as they share technology	Slower replication of the dominant variations creates stability Consistent selection criteria creates a standard set of routines or common operational strategy	Operational strategy persists and collective action creates cooperative alliances and mutually interdependent populations
Evolutionary trajectories (McGahan 2004) Traditional retailing: intermediate	Emergence: E-tailing has the *potential* to make core activities of traditional retailers obsolete	Convergence: Incumbents reconfigure their core assets into 'bricks n' clicks' and multichannel to complement e-tailing Co-existence: e-tailing and physical stores co-exist; a strong incentive emerges to collaborate with existing e-tail pioneers		Dominance: customer preferences and the terms of competition are established based on the new approach
E-tailing: Progressive	Fragmentation involving experimentation	Shakeout: a dominant model emerges	Maturity: competitive advantages are based on operational efficiencies based on incremental improvements and offering distinctive value	
Punctuated equilibrium (Romanelli and Tushman 1994)	Revolutionary period with discontinuous change	Equilibrium period with incremental change →		

(continued)

Table 2 (continued)

	Stage 1	Stage 2	Stage 3	Stage 4
Technological innovation (Bower and Christensen 1995)	Competence-destroying technological discontinuity Disruptive innovations	Competence-enhancing and competence-extending technological change →		
		Sustaining →		
Bases of competition (Christensen 1997)	Functionality	Reliability →	convenience and price	
Industry life cycle (Klepper 1997)	Exploratory	Growth →	De-maturity	
	Product innovation	Process innovation →		
Reverse life cycle (Barras 1986)	Process improvements improve efficiency	Process innovations →	Process innovations create improve service quality new types of services	
Density dependence (Hannan and Freeman 1989	A high organizational founding and disbanding rate as new organizational form emerges with low but increasing legitimation	Founding rates fall and disbanding rate rises; accentuated by dot.com crash	Diffuse competition predominates	New organizational sub-forms emerge
		Legitimation peaks and diffuse competition emerges		

but e-tailing's revolutionary period was a continuous progression of uncoordinated experimentation and learning. The entrepreneurs possessed strong technological skills but little retailing experience (Grewal et al. 2004) and rearranged existing retailing methods (Brown 1987). They were staggeringly well financed by venture capitalists. However, pioneering entrepreneurs must manage cash creatively or 'financially bootstrap' (Brush 2008) but these e-tail pioneers, especially the notable failures felt no necessity to aggressively control costs. In this fluid state of evolution, performance criteria are not well defined (Abernathy and Utterback 1978) and new performance metrics and terminology were deemed necessary to assess e-tailing and conventional financial and accounting benchmarks were seemingly ignored or deemed irrelevant.

If an evolutionary perspective had been adopted at this crucial stage, where e-tailing was seen as an evolution of existing retail formats, (for example direct marketing), this would have dictated targeting only high quality prospects, measuring the value of customers and using data to constantly fine-tune strategy. This approach may have helped early e-tail pioneers avoid their lavish expenditures on mass media advertising, which built brand awareness to many irrelevant prospects.

6.2 Stage Two

In this stage, emphasis was placed on profitability using conventional business models and accounting procedures and standards. Increased stability forced the early pioneers to adapt or die to become long-term settlers and their odds of survival increased with age (Malerba and Orsenigo 1996). The relative social status of the early leading e-tailers, such as Amazon may have increased their growth rate in their technological niche as it was seen as an indicator of quality (Podolny et al. 1996).

When large established store-based retailers entered in this crucial "middle" period, they had the resources to accelerate the legitimacy of e-tailing, to develop the budding industry and be well positioned to exploit its opportunities (Agarwal and Bayus 2004). Established retailers used various modes of entry and improved the overall quality, professionalism and respectability of e-tailing to a broader range of potential consumers. Their entrance parallels Sears and Montgomery Ward opening stores in the 1920s when the importance of catalogue houses was declining. The new channel did not displace sales from store-based retailers as they were aggressively expanding their stores and evolving into the 'bricks and clicks' operations, the early forerunners of multi-channel systems using e-tailing.

The most effective organizational transformations occur when links to earlier equilibrium periods are preserved (Romanelli and Tushman 1994). The successful transformation of retailers from 'bricks' into 'bricks n' clicks' may be indicative of this. The prevalence of fixed store retailers suggests e-tailing acted as a competence-enhancing and sustaining force for established retailers (Tushman and Anderson 1986; Bower and Christensen 1995). Incumbent retailers with more

'pre-fusion' offerings (Roy and McEvily 2004) and a breadth of architectural capability (Henderson and Clark 1990) found it easier to develop dual channel or multichannel retailing. Their existing knowledge helped them negotiate technological change and worked as a facilitator, rather than a source of inertia. Similarly, "firms with the best chances of success are those that possess relevant technological expertise and can apply that expertise to the new industry with minimal organizational restructuring." (Dobrev et al. 2004: 280).

This success of fixed store retailers differed with Davies (1998: 178) who stated, "However, once there is some stability in the design space, so large firms are more likely to take over and some of these may be existing large retailers; the likelihood however is that most fixed store retailers will be unlikely to make the switch." However, new modes of retailing are often successfully executed by imitating firms, rather than the originators (Brown 1987). If an evolutionary perspective had have been adopted at this time, e-tail originators may have more successfully fought of fixed store retailers.

6.3 Stage Three

The primary strategy at this stage is a focus strategy through cost leadership or differentiation (Davies 1998). In Carroll's (1985) resource-partitioning theory, market concentration can lead to differentiation. E-tailers pursuing cost leadership seek out economies of scale as they migrate to the mass market of the "Big Middle" (Levy et al. 2005) enabled by "Big Data" (McAfee and Brynjolfsson 2012) to become, "the place to get anything, anywhere, anytime." (Wohlsen 2013). They ignore peripheral niches in the market and free up resources for specialist e-tailers (Aldrich and Ruef 2006; Freeman and Audia 2006).

It was market influences, rather than underlying problems with the format, that drove the competitive strategies in this stage. As Dreesman (1968: 71) observed, "At every turn, a new retailing form takes over the torch of price reduction from older and more tired forms." In e-tailing Venkatraman (2000: 17) stated, "Indeed, the Net exposes the inherent weaknesses of high-cost competitors—whether they are big or small." Similarly, Rosen and Howard (2000) predicted e-tailing would promote a more purely competitive retail model with lower prices and increased competition.

6.4 Stage Four

Borrowing Reynolds' et al. (2007) observations from retail practitioners, e-tailing at this juncture: facilitates a drive to scale, via larger store sizes which in e-tailing is akin to increased product offerings; encourages specialty formats by making

them 'scaleable' and able to reach a critical mass; and, especially if e-tailing can enhance service and reduce costs (Sethuraman and Parasuraman 2005), the offering of 'real value—low prices plus quality' (Reynolds et al. 2007: 657). Big data will further empower the efficiency and performance of large pure play e-tailers and multichannel retailers and the predictive personalization (JWT Intelligence 2012) of specialists.

If Carroll's (1985) resource-partitioning model holds, specialist firms such as Dell may grow very large in their realized niche if they have a plentiful supply of the resources that they need to survive and specialist e-tailers would have a larger pool of available resources to utilize without directly competing with established generalist retailers. However, excessive specialization has been questioned, as the lengthening Anderson's (2006) long tail has negligible profitability with miniscule sales of many obscure products (Elberse 2008).

Although Grewal et al. (2004) felt current technology impeded e-retailers of very specialized products from communicating an up market positioning, low entry costs and improved search engines via specialist or "vertical sites," the development of highly specialized niches or micro-communities and improved filters on generalist search engines, allow them to easily expand their market coverage (Anonymous 2007; Kay 2007). Burt and Sparks (2003: 284–285) stated that:

> However, new business models and formats can be envisaged with retailers emerging with an unrivalled product offer in niche opportunities. Such depth assortment may provide a sustainable business if consumers can be convinced to trust these new operators.

These specialist e-tailers may be akin to 'process specialists' who in the evolution of certain industries enter in the later stages and erode the first mover advantages and market success of early entrants (Klepper 1997).

This specialization is analogous to reverse marketing or customer centric marketing as the web makes personalization easier (Sharma and Sheth 2004). Customization is achieved through collaboration and alliances between firms and is facilitated by the broader trend of mass collaboration involving the Internet (Tapscott and Williams 2006). Under this community approach, these mutualistic networks of firms may achieve symbiosis through their complementary differences and network economies (Freeman and Audia 2006).

The evolutionary perspective suggests that a continual wave of differentiation and fragmentation akin to Anderson's (2006) work. EBay would become susceptible to specialized auction sites, and 'reverse' auctions, where buyers post what they want and sellers compete for the business, although it has evolved from its auction roots into a fixed price e-tailer using a mobile platform (Stewart 2012; Wohlsen 2013).

The necessitation of collaborations between firms will mean that e-grocers may be vulnerable to a network model involving store-based grocers, warehouse companies and distribution firms such as Fed Ex.

This projected continued cycle of differentiation may be facilitated by, 'altering the storefront to fit a customer profile' through dynamic merchandising or

anticipatory selling (Katros 2000: 77) aided by the cost efficient customization of mass market products or one-to-one marketing. Eventually, the co-creation of products between retailers and customers may emerge (Sharma and Sheth 2004). Co-creation embraces virtual communities (including brand communities) and open-innovation (Zwass 2010). Users and a (brand) community of end users can be a competency in the e-tailer's the value chain (Prahalad and Ramaswamy 2000). The process is akin to 'controlled consumer empowerment' or 'customerization' (Pires et al. 2006) and is prevalent with the growth of social media platforms (Zwass 2010). The "installed-base effect" found in network effects (Wang et al. 2010) and user lock-in because of high switching costs (Amit and Zott 2001) means social media sites such as Facebook have become the dominant design for e-tailer-consumer social commerce and brand communities. Co-creation may occur on platforms provided by a firm (Zwass 2010). Many Web 2.0 enabled e-tailers ranging from t-shirts (Threadless), surf shorts (Shortomatic), cosmetics (Missha) and furniture (Made) are rooted in the fan base of a virtual (Hagel and Armstrong 1997) or brand community (Muniz and O'Guinn 2001). They use 'consumer democracy' which is akin to reverse marketing or customer centric marketing as the web makes personalization easier (Sharma and Sheth 2004). Customization is achieved through open systems (Chesbrough 2011) and collaboration and alliances between firms and is facilitated by the broader trend of mass collaboration involving the Internet (Tapscott and Williams 2006). Co-shopping, as envisioned by Chan and Li (2010) may extend the distribution channel or value creating network to include lead users (Bogers et al. 2010) or coordinating members inside the brand community.

Co-creation is facilitated by greater consumer control over the buying process because of the increased availability of shopping related information on the Internet (Grewal et al. 2004). IT-supported direct and database marketing practices, encompassing e-tailer web sites may facilitate the building of relationships with customers on a large scale. This makes customized marketing practices economically feasible and can build customer loyalty (Chirsty et al. 1996). The home pages of e-tailers that shoppers see can be customized based upon their past activity on the web site by using self-identification, past purchases and behaviourial data.

In this stage, various networks, alliances and relationships are envisaged. The very nature of e-tailing is integrative and network centric (Venkatraman 2000) with collaborative linkages and 'co-opetion' (Chatterjee 2002: 715) among the varied participants. 'Re-intermediation' on the Internet has created new forms of connecting buyers and sellers (Amit and Zott 2001) and new organizations have added a retail function (Dawson and Sparks 2010) and eventually every firm will, '…rely on the web to guide production, market, sell, and distribute goods' (Avent 2012). Empowered customers that co-create products in commercially-driven brand communities are now bona fide members of an e-tailer's value creating network. This furthers blurs a firm's boundaries (Amit and Zott 2001) and the unit of strategic analysis is now an enhanced network of suppliers, manufacturers, customers, partners, investors and customers (Prahalad and Ramaswamy 2000). Schau et al. (2009: 31) referred to 'networked firm-facing actors in brand-centered

communities.' E-tailers are now part of Achrol and Kotler's (1999) consumer opportunity networks. "Retailing governance refers to the actors involved in creating and delivering customer experiences" and retailers can innovate with co-creation by changing the governance structure (Sorescu et al. 2011: 6). 'Lead firms,' like Amazon and Facebook may create 'smart power' by exploiting big data and social data in a value creating business ecosystem (Williamson and De Meyer 2012).

E-tailers already utilize third party logistics intermediaries such as private warehouses and UPS who perform their retail functions flawlessly (Sorescu et al. 2011) and successful e-tailers offer their services to other e-tailers (Grewal et al. 2004). Therefore, operationally e-tailing is similar to other collaborative partnering technologies in retailing, such as EDI and ECR that foster informational and relational resource connections (Richey et al. 2008). Therefore, retail practitioners may already possess a relevant pool of experiential knowledge to implement the anticipated collaborative developments of this stage.

E-tailers now need to harness customers' participation in social media to renew their business models and make them productive (Sorescu et al. 2011). On-line communities are beginning to transform marketing (Kozinets et al. 2008) Future, technological developments in social media tools will likely focus on these community-building features. The challenge for practitioners is how to utilize the Internet to engage consumers individually and communally (Simmons 2008).

Co-creation or 'active partnering' within a Facebook-enabled brand community is a mechanism for e-tailers to understand, 'the job that customers are trying to get done' (Bettencourt et al. 2013: 21) and increase an e-tailer's customer-centric stance and competitive footing. Bettencourt et al. (2013: 13) observed:

> By further focusing service innovation on developing shared solutions with customers, firms are better able to create breakthrough service offerings and processes. This will result in value co-creation that is both meaningful to customers and uniquely differentiated from competitive offerings.

The projected demise of physical stores by e-tailing in the heady days of its revolution was drastically overstated. Under an evolutionary framework, if e-tailing is successful it will not destroy the original format of physical stores as it continues to have a large and in retrospect, greatly underestimated advantage with customers. However, at this stage the framework posits that e-tailing itself comes under the same sort of attack. Although, the original format of fixed store retailing is supremely strong and there was no apparent attack on e-tailing from a 'revolutionary' format, Tapscott and Williams (2006) did foresee peer pioneers as replacing first generation e-tailers. The conclusion of Keep and Hollander (1992) who used a historical analysis to study the innovation of mail order on store-based retailing is still very relevant:

> The strength of in-store retailing has frequently been underestimated, its demise prematurely predicted on a number of occasions. Based on the mail order experience, even with clearly identifiable target markets and distinct added values, new nonstore retailers will have difficulty displacing traditional retailing. (Keep and Hollander 1992: 82).

Evolutionary approaches are underpinned by a cyclical process that can be mapped and technological innovation is a major cause of industry change (Dosi et al. 1997). As e-tailing meshes with social media into social commerce and social shopping (Stephen and Toubia 2010), practitioners should be well advised to re-visit the lunacy of the heady days of stage one. If social commerce is a new 'revolutionary' development or disruptive technology (Christensen and Raynor 2003) and is in the throng of its revolutionary phase, an evolutionary perspective proposes that it will follow a predictable pattern of development. Antidotal evidence indicates 'Facebook commerce' or 'f-commerce' is characterized by a degree of experimentation with varied successful and failing formats (Lutz 2012; Zimmerman 2012). For example, e-tail purchases are occurring within social media sites, social media enabled brand communities, or directly linked to a firm's e-tail site. Levis' 'Friends' store is a social shopping channel and representatives of Avon's 'Mark' brand sell on Facebook on customized pages.

Reiterating Grewal et al. (2004), practitioners should re-visit the business concepts of the small entrepreneurial e-tailers in stage one at the time of the dot.com bust. Technological advancements mean these could be modified to be profitable today. Many e-tailers in large cities are currently experimenting with free same-day delivery (Stross 2012), similar to that offered by Kozmo from 1998 to 2001.

6.5 The Changing Role of e-Tail Marketing Practice

The role of e-tail marketing will change as:

> Marketing on behalf of consumers, as opposed to marketing to consumers, means marketers will devote more time and resources to organizing consumers and consumer information, as well as to managing product, consumption, and lifestyle-related information that is useful to the consumer (Achrol and Kotler 1999: 147).

E-tailer's brand management will focus on being invited into consumers' lives with 'resonant cultural conversations' instead of intrusive claims of competitive differentiation (Fournier and Avery 2011: 205). E-tailers must find original techniques to use social networking sites, as *exchange* media, rather than as *one-way*, *or even two-way*, *communication channels* (Sorescu et al. 2011: 14). "Native advertising integrates high-quality content… into the organic experience of a given platform. This means the content is so complementary to the user's experience on the platform, it doesn't interrupt the flow." (Dietrich 2013). In a commercially receptive and customer empowered brand community (Muniz and O'Guinn 2001; Kozinets 2010) that becomes an anchoring place (Aubert-Gamet and Cova 1999) for highly committed and influential and trusting customers, retailers can create an on-going relational exchange with permission marketing (Godin 1999). This will be accentuated if a consumer's Facebook page becomes the dashboard for their

life, Facebook evolves into an even more powerful 'infomediary' (Sharma and Sheth 2004) and customizable content platform, based upon what the consumer and their Facebook friends like (Grant 2012).

Under this approach, marketing's basic role changes to support the "linking value" of products and services (rather than its use value) that hold together the tribe of enthusiasts, anything that reinforces community links and advances a sense of tribal kindredship. This difference may explain why initial attempts at F-commerce by opening stores directly within Facebook sites languished (Lutz 2012). Social media provides an "anchoring place" (Aubert-Gamet and Cova 1999) where tribes gather and support their rituals. E-tailer's should not add a social layer to existing loyalty programs but use social media to build a genuine sense of "we-ness" and "linking value" to establish and/or reinforce bonds between individuals in a brand community. This focuses on the customer/customer relationship not the customer/company relationship.

6.6 *The Promise and Perils of Big Data and Social Data on e-Tail Marketing Practice*

E-tailing is going to become a much more science-driven activity as:

> In the trenches, this change suggests a shift toward sophisticated data analytics similar to the revolution that has already taken place in industries such as financial services, as well as in airlines and other industries where yield management is important. (French et al. 2011)

Increased levels of shared information in a network, including information co-created with consumers will create chances for, 'next generation business intelligence to create value' (Kauffman et al. 2010: 114), especially if the tools of artificial intelligence are used (Lohr 2012). In the short run, the commercial promise of this data to e-tailers be stalled by problems in managing such a mass of data (Kjellberg et al. 2012) and the need for new management skills and styles (McAfee and Brynjolfsson 2012). The technical capabilities of the systems may exceed the know-how and capabilities of marketing practitioners (Saren 2011) even if they possess a high level of 'technological readiness' (Richey et al. 2008: 848). A survey of 800 marketers at Fortune 1,000 companies discovered most marketers still rely too much on intuition and use data for just 11 % of all customer-related decisions and that even data addicts that use big data use it badly as they change direction every time they see an irregularity that contradicts their overarching strategy (Spenner and Bird 2012). However, the knowledge obtained may be the most resource for competitive advantage (Lusch 2011) and the potential returns are substantial and e-tailers are already among the most 'data-driven' of organizations (McAfee and Brynjolfsson 2012). A precursor to the huge potential rewards for e-tailers who can successfully manage big data in social commerce is the analogy to Wal-Mart:

> In the 1980s and 1990s retailers such as Wal-Mart used their mastery of retailing data to launch the "big-box" revolution (huge out-of-town stores with ultra-low prices). Today's big data will provide the raw material for further revolutions. (The Economist 2011).

Retailers, probably as part of a technological partnership and value creating network who can successfully manipulate 'big data' may increase their operating margins by 60 % (Manyika et al. 2011). Technology enabled networks will now include consumers and these provide Morgan and Hunt's (1999) vital relational and informational resource linkages that create sustainable competitive advantage (Gulati et al. 2000; Richey et al. 2008). The assessment of users' aggregated hyperlinking, gathering, rating and ranking and tagging (Kozinets et al. 2008) will create a collective intelligence (O'Reilly 2005) of social data. Social media has led to a social sharing of information (Armano 2011) and this social data will be increasingly exploited (Lazerow 2013; Sengupta 2013) by retailers' 'ecosystems' (Lohr 2012). This will further enhance e-tailer's 'business efficiencies' (Burt and Sparks 2003) and ability to offer lower prices and the precision of segmentation will move from a 'rifle shot' 'to high tech laser beam' (Holbrook and Hulbert 2002) as e-tailers personalize and co-create their offerings in real time.

7 Conclusion

Academic research has not answered the question if an evolutionary or revolutionary approach prevails in e-tailing (Doherty and Ellis-Chadwick 2006) but this chapter developed a framework and interpretations to support an evolutionary approach.

The term 'evolution' is commonly used in the literature to merely describe, with little theoretical underpinning, the historical and anticipated future development of a retail innovation. To remedy this and to find a more holistic explanation, this chapter applied the evolutionary perspective, specifically Davies' (1998) ideas on evolutionary change to e-tailing. It strove to find a balanced middle ground between the overly simple classic approaches of retail innovation and overly complicated and esoteric combination frameworks of retail evolution. The resulting classification scheme acts as an organizational device to capture and clarify the pattern of process of e-tailing's past and anticipated future development. The application of a theoretically grounded and longer term evolutionary perspective produces feasible insights into e-tailing's future development. It avoids the overly enthusiastic visions of past predictions made during the previous revolutionary periods of the early technological prototypes of the 1960s and 1970s and the days before the dot.com crash.

Many retail innovations are casually labeled as 'revolutionary' when they appear; however it is proposed that retailing innovations, such as e-tailing and many previous retailing innovations, have a revolutionary phase within an evolutionary context. When innovations projected to have revolutionary changes

interrupt a calmer period, they are merely a phase of evolution, before they again settle into a predictable pattern of development where smaller incremental changes over time can cause big differences between the past, current and future versions of an innovation, so that may outwardly appear as revolutionary.

The shape and form of e-tailing, like all retailing institutions and mechanisms continually evolves. The future potential of big data facilitated e-tailing and social commerce (Stephen and Toubia 2010) will enable the customization and co-creation of offerings (Etgar 2008) by e-tailers embedded in a value creating network (Zott and Amit 2010) that also encapsulates empowered consumers in a commercially receptive brand community (Schau et al. 2009; Kozinets 2010). They will interact and shop with e-tailers across multiple converging e-tail platforms and retail touchpoints in an omnichannel (Rigby 2011).

Recent 'revolutionary' developments in this technologically-driven pattern of change can be farmed within the focus and fragmentation phase of e-tailing's evolutionary framework (Williams 2009) to provide a timely strategic road map for e-tailing practitioners. lf however, the tumultuous rise of many current developments that embrace e-tailing are indeed the transformative revolutionary phase of a new spiral of evolution, then numerous evolutionary perspectives predict a discernible pattern of development will follow. This enables astute organizations involved in the multifaceted nature of e-tailing to gauge their position and strategic options.

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The Role of e-Commerce in Multi-Channel Marketing Strategy

James R. Brown and Rajiv P. Dant

Abstract This chapter describes the key aspects of managing multiple marketing channel systems and explains how e-commerce plays a key role in their successful operation. We adopt a customer-centric perspective by beginning with a discussion of channel service outputs—those benefits that customers hope to obtain from the marketing channel. Successful firms recognize that customers are not homogeneous in their desire for channel service outputs and, hence, can be grouped into market segments that are best served by different marketing channels. We enumerate the advantages of multiple channel systems and describe some of their limitations, in particular, potential conflict among the various channels and one channel's cannibalization of another's demand. The effective integration of the firm's diverse marketing channels can overcome these problems and, simultaneously, generate superior multi-channel performance. Finally, we recommended that channel decision-makers be cognizant of and accommodate the demand environment that confronts the firm's multiple marketing channels. Specifically, the complexities and the differential effects of the buying and selling stages and the channel life cycle stages cannot be ignored in designing a successful multi-channel system.

Keywords Multi-channel marketing · e-commerce · Market segmentation · Channel conflict · Cannibalization · Channel performance · Buying and selling stages · Channel life cycle

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1 Introduction

Recent figures show that e-commerce in the U.S. is nearing the $200 billion revenue mark and amounts to roughly 9 % of total retail sales (Rigby 2011). Projections are that e-commerce will eventually account for about 15–20 % of total retail sales (Rigby 2011, p. 66). In the apparel sector, for example, the estimated 18.2 % average annual growth in e-commerce revenue has far outpaced the roughly 0.2 % average annual revenue gain generated by brick-and-mortar outlets (Panteva and Stampfli 2012). According to a recent article in *Multichannel Merchant* (T.P. 2011), e-commerce experienced a sales increase of 17.6 % in 2011 over 2010, with the apparel, children's clothing, and footwear lines of trade accounting for most of this increase. Thus while e-commerce may not have attained the lofty position forecasted in the late-1990s, it has still become a formidable force with which bricks-and-mortar retailers must reckon. And, many traditional retailers have done just that by adding an internet presence to their channel portfolios.

Using multiple pathways to reach their target market customers is nothing new; firms have done so for decades (Moriarity and Moran 1990; Preston and Schramm 1965; Weigand 1977). For example, Snap-On Tools utilizes franchised distributors who serve smaller customers (e.g., car dealerships, small industrial fabricators, independent professional mechanics) from their truck-mounted warehouses, while they employ a company sales force to call upon large industrial customers who may need specialized tools or diagnostic equipment. The advent of e-commerce has made available another, high profile pathway to reach target markets. As a result, e-commerce has brought additional attention to the concept of multiple marketing channels (Neslin and Shankar 2009).

The purpose of this chapter is to examine key aspects of managing multiple marketing channel systems and how e-commerce plays a key role in their successful operation. The chapter is organized according to Fig. 1. We begin with a discussion of channel service outputs—those benefits that customers hope to obtain from the marketing channel. Customers are not homogeneous in their desire for channel service outputs and, hence, can be grouped into market segments that are best served by different marketing channels. The extent to which the operation of those multiple channels is synchronized refers to multi-channel integration. Managing conflict among the various channels and minimizing one channel's cannibalization of another's demand are key outcomes of multi-channel integration. Effective multi-channel integration with limited cannibalization is expected to generate superior multi-channel performance. All of this takes place within the demand environment that faces the firm's marketing channels.

Before discussing the major elements of Fig. 1, we define what we mean by "marketing channels" and "multiple marketing channels." We then highlight some of the advantages and disadvantages of using multi-channels.

Marketing channels are defined "as a set of interdependent organizations involved in the process of making a product or service available for use or

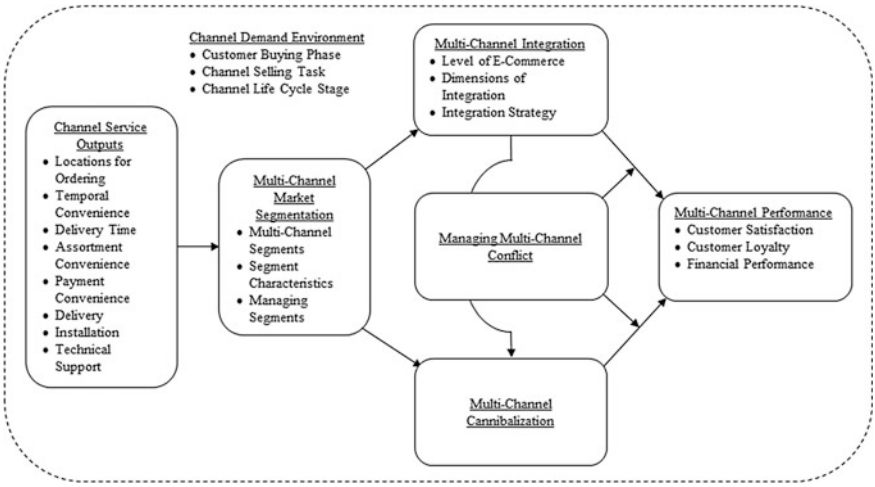

Fig. 1 Managing a multi-channel marketing system

consumption" by organizational customers or household buyers (Stern et al. 1989, p. 5, emphasis deleted). They "… typically include the store, the Web, sales force, third party agency, call center, and the like" (Neslin and Shankar 2009, p. 70). *Multiple marketing channels* occur "… when a firm makes a product [simultaneously] available to the market through two or more channels of distribution" (Coelho et al. 2003, p. 23). For example, some firms, such as the U.S.-based outdoor outfitter L.L. Bean, use multiple types of retail outlets to reach their target markets, including retail stores, catalogs, websites (Wallace et al. 2004). Others, such as the Highland Mint—a U.S. marketer of sports memorabilia—utilizes its own e-commerce channels as well as television shopping networks.

Firms use multiple marketing channels for a variety of reasons. Some of their more prominent advantages are detailed in the following section.

1.1 Advantages of Multiple Channel Systems

One reason why firms use multiple marketing channels is that they provide marketers with lower cost access to new markets (Zhang et al. 2010). Electronic channels are routinely more profitable than their bricks-and-mortar counterparts; for example, "online-only [clothing] retailers earn 6.8 % in pre-tax profit, whereas brick-and-mortar stores earn 5 %" (Panteva and Stampfli 2012). Part of the reason is that e-commerce operates with lower overhead. Lower real estate costs and higher labor productivity are just two of the ways in which internet channels are less costly. Further, "…adding non-store channels (e.g. Internet, catalogs, mobile phones) enables retailers with limited locations to exploit economies of scope by expanding their markets without building additional stores" (Zhang et al. 2010, p. 169).

Second, using multiple channels enable firms to generate increased customer satisfaction and loyalty (Wallace et al. 2004; Zhang et al. 2010). For example, by adding multiple channels, a marketer expands the ways in which it can create additional value for its customers (Wallace et al. 2004). For instance, e-commerce channels provide time-strapped customers with a convenient location (their own homes), convenient times (24 h a day, seven days a week), and ready access to product information (Shankar et al. 2011; Zhang et al. 2010). These benefits expand the ease with which customers can shop for the marketer's products, purchase those products, and obtain post-sale support for them.

Third, a firm can create a strategic advantage by using multiple pathways to reach its target customers (Zhang et al. 2010). Multiple channels provide firms with a better understanding as how to satisfy their customers' needs and wants, as well as how to deliver customers a seamless experience through their multiple channels (Zhang et al. 2010). Successful multi-channel firms create a strategic advantage through their distribution efficiency, assortments of complementary and unique merchandise, and the presentation of product information, as well as the collection and utilization of customer information (Alba et al. 1997). To the extent that the firm can leverage this knowledge and expertise derived from operating multiple marketing channels, it can create a strong, strategic advantage over its competitors.

1.2 Disadvantages of Multiple Channel Systems

In spite of its many advantages (for a fuller listing, see Coelho and Easingwood 2004), a multi-channel system for reaching the marketplace has a number of drawbacks. First, multiple channels can create customer resentment and confusion (Coelho and Easingwood 2004) especially, for example, if customers face higher prices in one channel as opposed to another. Further, different channels provide different levels of service (Coelho and Easingwood 2004). For example, a large segment of the market still prefers to shop for clothing and accessories at bricks-and-mortar stores because they can see and try on products (Panteva and Stampfli 2012). For these customers e-commerce can be frustrating because sizes and colors are frequently not as depicted.

Second, if the firm charges wholesale prices to its traditional resellers that result in higher retail prices than those charged on the internet, conflict between the firm and its resellers can ensue. It can also occur if e-commerce channels capture a significant amount of the traditional resellers' market demand.

A third disadvantage of multiple channel systems is that their cost advantages may not materialize, or take too long to accrue (Coelho and Easingwood 2004). These costs involve additional investment in facilities and equipment (e.g., fulfillment warehouses and materials handling equipment for e-commerce), human resources (e.g., call center employees and their training), and product adaptation (e.g., different product models or lines) for multiple channels. In addition, shipping

delays and lost-in-transit shipments undercut the promise of convenient shopping, ordering, and payment for e-commerce channels; further, the cost of shipping can amount to about 25 % of sales revenue (Panteva and Stampfli 2012).

2 Managing Multiple Marketing Channels

In spite of their disadvantages, many firms find that the advantages of operating multiple marketing channels outweigh their drawbacks. The effective management of a multi-channel marketing system involves several steps (Fig. 1). These steps include understanding: (1) what customers want from the channel (i.e., channel service outputs), (2) how the heterogeneity of their desires results in market segments, (3) how integrating the operations of multiple channels can minimize channel conflict and limit cannibalization of demand, (4) the impact of multi-channel integration, managing channel conflict, and limiting cannibalization on multi-channel performance, and (5) the role of the channel demand environment (e.g., stages of the buying and selling processes) in affecting the management of multiple marketing channels.

2.1 Channel Service Outputs

Marketing channels create value for their customers by providing them with their desired products and services. The channel service outputs include locational convenience, temporal convenience, depth and breadth of assortment, desired product quantity, and support services such as product information, provision of credit, and after-sales service (Stern and Sturdivant 1987). New technologies including electronic commerce have enabled these service outputs to be unbundled, especially the provision of product information and the execution of transactions (cf. Neslin and Shankar 2009; Schoenbachler and Gordon 2002; Van Bruggen et al. 2010).

As a result, multi-channel marketing makes "… more service outputs available across several channels, [therefore] final customers have an opportunity to engage with a retailer over multiple contact points; this can occur during a single purchase or over multiple purchases" (Wallace et al. 2004, p. 250). This also means that different marketing channels can specialize in the provision of different channel service outputs.

For example, e-commerce channels for Ford automobiles provide valuable product information that allows customers to learn about Ford's car models and their attributes, design their own automobiles, connect with other Ford enthusiasts, and locate nearby Ford dealers. However, the customer can only purchase a new Ford automobile through an authorized Ford dealer. Hence, Ford's electronic channel supplements its dealer channel by providing its customers with convenient

Customer Benefit	Who Provides Channel Service Outputs?*	
Locations for Ordering	Distant	R — C, E → Nearby
Temporal Convenience	9-5 M-F; 9-Noon Sat	R — C — E → 24/7
Delivery Time	Delayed	C, E — R → Immediate
Assortment Creation	Multi-Stop Shopping	C — E — R → One-Stop Shopping
Payment Convenience	Cash Only	R, E, C → Cash/Check/Credit
Delivery	Cash & Carry	R — C, E → Delivery Provided
Installation	Not Available	C — E — R → Turn Key Service
Technical Support	Not Available	C — E — R → Available Where Needed

Fig. 2 Locus of functional performance in multiple marketing channels (Adapted from Alba et al. 1997, Table 1) (*) E: e-commerce channel; *R* retail store; *C* catalog store

access to product information (cf. Finlay 2011). For customers who prefer to minimize their contact with the dealer's sales force, the information channel is somewhat decoupled from the transaction channel (i.e., the dealer channel).

As the Ford example shows, e-commerce has given customers more control over their points of contact with the marketer (Wallace et al. 2004). In a sense, customers are able to mix and match a firm's multiple channels by repackaging the channel's service outputs to maximize the value they receive (cf. Rigby 2011).

Figure 2 illustrates this point. For example, a consumer shopping for a new refrigerator may utilize on-line channels to gather information about product features and how well various brands stack up on those features. She may opt to buy the refrigerator from a local retail store who can provide immediate delivery and installation as well as haul away and dispose of her old "fridge." Another consumer may gather product and feature information at various "brick and mortar" retailers and then opt to buy from a "cash and carry" retailer where he arranges for his own delivery, installation, and old product disposal. Of course, he expects to pay a lower price because he undertakes more of the channel service outputs for himself.

As these examples illustrate, customers vary in their desire for channel service outputs. This reinforces an important reason as to why firms use multiple channels—different channels are needed to reach different market segments.

2.2 Understanding Customer Segments

A key axiom of contemporary marketing thought is that markets are comprised of customers who vary in their needs and wants. The challenge for the marketer then is to divide the market into groups of customers that are homogeneous within each group in terms of their needs and wants, but are maximally different from other groups. This process of dividing the market is termed *market segmentation* (Raulerson et al. 2009). The next step is for firms to identify those market segments that present the greatest potential for sales, profits, and future growth. Firms

will then direct the lion's share of their marketing resources to developing and exploiting these *target market segments*.

Because advertising media use easily measurable characteristics (e.g., gender, household size, household income) to describe their audiences, marketing researchers attempt to identify target market segments by these same characteristics. They also attempt to identify target market segments according to customers' previous behaviors. A number of academic studies have attempted to identify the characteristics of market segments in terms of their multi-channel behavior. Several of these studies are summarized in Fig. 3.

Some of these studies have attempted to describe *multi-channel shoppers*, customers who patronize all of the firm's channels to develop his/her portfolio of

	Sample	Sample Size	Segments Identified			
			Segment A	Segment B	Segment C	Segment D
Keen et al. (2004)	Chicago, U.S.A.	290 mall shoppers	Generalists • Roughly equal importance of all attributes • Preference for retail format • Price • Control over purchase • Ease of use • Subjective norms • Previous experience buying through format	Formatters • Preference for retail stores • Price	Price Sensitives • Price-driven • Format preference • Previous experience with format	Experiencers • Positive previous experience purchasing through the format • Format preference • Price
Kumar and Venkatesan (2005)	Multinational	• 3758 customers in Sample 1 • 3721 customers in Sample 2 • 3200 customers in validation sample	Multi-Channel Shopper • Customer tenure • Purchase frequency • Customer-initiated contacts • Cross-buying • Product returns • Customer-initiated web-based contacts			
Thomas and Sullivan (2005)	U.S.A.	4162 first time customers of a major retailer	Remote Channel Immigrants • Distance from closest store • First purchase is from catalog	Bricks-and-Mortar Shoppers • Channel loyal to bricks-and-mortar store • First purchase is from brick		
McGoldrick and Collins (2007)	U.K.	780 consumers	Stores-Prone • Older • Work more hours • Further from shops • Less computer experience • Less weekly internet usage	Catalog-Prone • Older • Work fewer hours • Closer to shops • Least computer experience • Least weekly internet usage	Internet-Prone • Younger • Work more hours • Furthest from shops • Most computer experience • Most weekly internet usage	Multi-Channel • Younger • Work more hours • Further from shops • Less computer experience • Less internet usage
Konuş et al. (2008)	The Netherlands	364 consumers	Uninvolved Shoppers • Low attitudes toward all channels for all transaction phases -- low loyalty • Low shopping enjoyment • Lower price consciousness • Slightly high innovativeness	Multi-Channel Enthusiasts • High innovativeness • High shopping enjoyment • Low loyalty • Consumers who tend to use the internet and catalogs for both information search and purchase	Store-Focused Consumers • High loyalty • Somewhat higher shopping enjoyment • Low innovativeness • Greater tendency to use the store for both search and purchase.	
Pauwels et al. (2011)	The Netherlands	6594 customers of a retail chain	Smart Fans • Showed the highest response to web site introduction • Show the highest response to online and offline price promotions and competitive actions • Search the largest number of topics of interest on the web • Consult more online pages on price-oriented 'special actions' than customers in the other segments • Have more higher education • Have more kids • Are more likely to be male	Fun Loving Locals • Reduced purchase volume (€) after website introduction • Consult more online pages on games and sending e-cards than other customers do • Live closer to a store • Earned less higher education • Have fewer kids than customers in the other segments	Fashionables • Not very price sensitive • Focus on accessing pages on broader themes such as fashion, gift giving, and 'especially for you' items • Spend more money per product after website introduction	

Fig. 3 Market segments identified by selective studies on multi-channel customer behavior

marketing channel services. Typical multi-channel shoppers can be described by behavioral characteristics such as their longevity as customers, how frequently they purchase, the number of contacts they initiate with the firm, the number of product categories they buy from the firm, and the number of products they have returned over their lifetimes as customers (Kumar and Venkatesan 2005). They also tend to use both online (i.e., e-commerce) and offline (e.g., catalog) channels both for information search and purchase (Konuş et al. 2008). Multi-channel shoppers can also be defined by demographic characteristics. They are younger, work more hours, live further from stores, have less experience using the computer, and are not connected to the internet as much (McGoldrick and Collins 2007). Psychographic characteristics also describe multi-channel shoppers as being highly innovative and enjoying shopping (Konuş et al. 2008).

Bricks-and-mortar shoppers tend to be older, work more hours, live further from stores, have less computer experience, and use the internet less often (McGoldrick and Collins 2007). In addition to these demographic characteristics, store shoppers are not as innovative, but derive somewhat more enjoyment from shopping (Konuş et al. 2008). They are also price-oriented and like to have more control over their purchases (Keen et al. 2004). Bricks-and-mortar shoppers are channel loyal (Keen et al. 2004; Konuş et al. 2008; Thomas and Sullivan 2005) and use stores for both information search and purchase (Konuş et al. 2008).

Internet shoppers live farthest from the closest stores (McGoldrick and Collins 2007; Thomas and Sullivan 2005). They are also younger, work more hours, have the most computer experience, and are online more hours per week (McGoldrick and Collins 2007).

Pauwels et al. (2011) further divide the internet shopper market into three key segments. *Smart Fans* are those customers who react most positively to the e-commerce efforts of the firm and its competitors. They are more likely to be male, have more kids, and are more highly educated. *Fun Loving Locals* show a weaker need for the market offerings of the firm and its competitors. These customers are more involved with online gaming and sending e-cards. They tend to live closer to the firm's stores, have less higher education, and have fewer children than customers in the other segments. *Fashionables* are not very price sensitive and focus their online behavior on broader themes such as fashion, gift giving and 'especially for you.'

While these studies have emphasized business-to-consumer markets, multiple channels are used to reach business-to-business markets, as well. These markets are typically segmented on the basis of (1) geographic location, such as the Eurozone (Moriarity and Moran 1990; Raulerson et al. 2009); (2) customer size, such as number of employees or company sales volume (Raulerson et al. 2009) or in terms of purchase volume (Moriarity and Moran 1990); (3) industry, such as machinery manufacturing, paper products wholesaling, or commercial banking (Moriarity and Moran 1990; Raulerson et al. 2009), and (4) product boundaries, such as mid-range and high-end copiers versus low-end machines (Moriarity and Moran 1990).

The point of this discussion is that customers are different—they have different needs and wants, shop differently, are characterized by different demographics,

and hold different life styles. The different marketing channels are needed to reach and satisfy these different customer segments. The challenge is to orchestrate the firm's multiple channels to produce a viable symphony of customer satisfaction and firm profits, instead of a cacophony of unhappy customers and shareholders.

2.3 Integrating Multiple Marketing Channels

One key to success in managing multiple marketing channels is their integration (Neslin and Shankar 2009). Coordinating the marketing channel service outputs offered through each channel is the essence of integrating multi-channel operations. Because most firms have added electronic channels to their multi-channel portfolio, understanding the level of e-commerce utilization is the starting point for developing an integrated multi-channel marketing channel strategy.

According to Karjaluoto and Huhtamaeki (2010), firms can be categorized according to four different levels of e-commerce utilization, depending upon the extent to which marketing channel service outputs are provided through electronic channels. With the most basic or *informational level* of e-commerce utilization, firms provide their customers with product information and, in essence, use the internet as an electronic "brochure" for their goods and services (Karjaluoto and Huhtamaeki 2010, p. 33). The next level of e-commerce utilization is the *communication level*. This level incorporates mechanisms for customer feedback and interaction with the firm; it also employs more sophisticated means of communicating with the marketplace (e.g., newsletters). The *transactional level* represents the third level of e-commerce utilization (Karjaluoto and Huhtamaeki 2010). At this level, firms conduct transactions with their customers and offer them with pre- and post-purchase services. The final step in e-commerce utilization is when electronic channels become an *integrated part of business*. At this level, firms integrate e-channels with their traditional channels (e.g., bricks and mortar stores, external sales force) so that customers can mix and match where they receive various channel service outputs from the firm. This is the step where a customer can order online, pick the product up from a nearby store, and return a defective product via direct mail or to a store.

In summarizing the literature, Lee and Kim (2010) identified four dimensions of multi-channel integration. They include reinforcement, synergy, reciprocity, and complementarity. *Reinforcement* occurs when a firm offers consistent merchandise, prices, messaging, and customer service through all of its channels, and when those channels reinforce the efforts of each other (Lee and Kim 2010). When firms allow customers to utilize different channels to obtain their desired portfolio of service outputs, *synergy* among those channels is said to occur (Lee and Kim 2010). The *reciprocity* dimension of multi-channel integration means that no one channel "dominates the other[s]; instead, [they] … support each other …" thereby providing customers with "more advantages [when they use] … both together" (Lee and Kim 2010, p. 284). The final dimension of multi-channel integration is

complementarity. "*Complementarity* is the concept by which a company understands the strengths and weaknesses of each channel and applies different strategies accordingly …" (Lee and Kim 2010, p. 285).

A firm that utilizes multiple marketing channels faces several options for managing those channels: (1) an offline focused strategy, (2) online focused strategy, (3) an isolation strategy, or (4) an integration strategy (Müller-Lankenau et al. 2006).

The *offline focused strategy* emphasizes brick-and-mortar stores and uses e-commerce channels to drive demand to those stores by providing information about store locations, in-store goods and services, and special promotions. "Potential motivations for pursuing this strategy are a sophisticated distribution system optimized for providing goods to a network of shops, a differentiation strategy focused on in-store customer consulting services, which cannot be offered on the Web, or contractual restrictions vis-à-vis channel partners" (Müller-Lankenau et al. 2006, p. 190). Aldi, the global discount food retailer based in Germany, is a prominent practitioner of this strategy.

In contrast, the *online focused strategy* emphasizes e-commerce channels and uses its offline channels to drive demand toward its lower cost, higher margin online operations. Netflix (the U.S.-based DVD sales and rental company) follows this strategy. While customers can still receive DVDs by mail (its traditional offline channel), the company emphasizes online video streaming.

> An *isolation strategy* is pursued when online and offline channels are managed as separate or independent entities …. Neither communication activities nor incentives or explicit links support or encourage customers to switch between channels (Müller-Lankenau et al. 2006, p. 190).

These authors argue that the desire to target different market segments or to avoid channel conflict motivate the use of this strategy. When Wal-mart first entered e-commerce it pursued an isolation strategy; however, its e-commerce and bricks-and-mortar channels have become much more integrated in the past five years.

An *integration strategy* sees multiple channels as complementary routes to providing customers with the service output bundles that they desire (Müller-Lankenau et al. 2006). An example of this strategy is Walmart's Site to Store program which enables customers to shop online and pick up their orders at their nearest Walmart store. In addition, customers can return online orders shipped to their homes at their local Walmart store. These programs provide customers with their desired level of ordering convenience along with quick order delivery.

As noted earlier, one advantage of pursuing a multi-channel marketing strategy is the synergy that it provides. That advantage, however, "… can only be achieved through integration of the channels and continued focus on the customer, rather than the channel" (Schoenbachler and Gordon 2002, p. 47). This means that the synergies promised by integrating the firm's multiple channels, including its e-commerce channels, are only possible when those channels reinforce, complement, and balance each other without losing their focus on customer.

2.4 Marketing Channel Conflict and Demand Cannibalization

While the promise of channel synergy attracts firms to a multi-channel strategy, the possibility of demand cannibalization repels them (Neslin and Shankar 2009). If the addition of new channels entices new customers and/or causes existing customers to expand their purchases, the increase in demand can produce channel synergies (Zhang et al. 2010). In contrast, if new customers fail to materialize or existing customers shift their purchases from one channel to another without increasing their level of demand, cannibalization is likely to occur. In other words, the firm's multiple channels divide a fixed demand pie rather than sharing an expanded one.

Cannibalization is most likely to occur when the goods offered and prices charged across the various channels overlap considerably (Deleersnyder et al. 2002), and when the services offered vary considerably (Rangan 2006). These conditions represent fertile ground for marketing channel conflict to take root, as multiple channels target and pursue the same customer segments (Coelho and Easingwood 2004).

Vertical competition, differing goals, and distributor free-riding are three situations in which cannibalization, and subsequent channel conflict, can occur.

When a firm markets through its own outlets (e.g., e-commerce) as well as independent distributors, vertical competition ensues. Vertical competition becomes particularly intense when a firm undercuts the prices of its independent distributors by charging lower prices through its e-commerce channels (cf. Weigand 1977). Such a situation causes distrust and disgruntlement among its independent channel partners.

When a firm's e-commerce channels attract the same customers as the firm's independent distributors, disputes occur over who owns the customer (Eggert et al. 2012; Hagel and Lansing 1994). If suppliers believe that they own the customer, they are likely to develop marketing programs to build brand loyalty and to utilize whichever channels they can to reach the customer. If distributors believe that they own the customer, they are more responsive to marketing efforts that steer customers to them (i.e., build distributor revenue and loyalty). These different goals represent a classic cause of marketing channel conflict (Brown and Day 1981; Dant and Schul 1992).

A final example is free-riding. Free-riding occurs when consumers evaluate and compare products in a full-service channel outlet (e.g., specialty photography shop), and make their purchases in a low-cost, lower-service channel outlet (e.g., discount mass merchandiser). A particular example of free-riding is the notion of "showrooming," wherein a consumer evaluates a product in a "bricks-and-mortar" store, then buys it from a competitive e-commerce website (Zimmerman 2012).

Free-riding occurs because marketers cannot separate their markets. In other words, price-conscious customers are able to shop at those outlets targeted to service-oriented customers. For example, apparel shoppers can visit bricks-and-

mortar stores to compare a garment's product quality, color, and size, and then shop online for lower prices. As a result, low-price outlets can benefit from or free-ride on the services provided by full-service outlets.

The next section describes a number of techniques for reducing the likelihood of demand cannibalization across a multi-channel system. These techniques also limit the subsequent level of conflict that stems from operating multiple channels.

2.5 Managing Multiple Channel Conflict

Effective conflict management can help firms overcome the problems that result from cannibalization in multiple channel systems. It involves managing the market offering to dis-incentivize distributors from seeking other channels' customers, and customers from seeking the market offering from alternative channels. The basic challenge is to insulate one marketing channel's customers from another's.

One way in which firms can manage cannibalization is to set product and/or customer boundaries (Moriarty and Moran 1990; Rangan 2006). With product boundaries, the objective is to route different products through different channels. For example, a manufacturer of portable generators could market its heavy duty products to building and road contractors through industrial distributors. Homeowners, however, might find its lighter duty products in hardware stores, home improvement centers, and warehouse clubs. Customers may be classified according to geographic location, order size, account size, or industry (Moriarty and Moran 1990; Rangan 2006). Further, some firms such as Snap-on, the hand tool maker, restrict their channels to solely service named accounts.

As long as product boundaries and customer boundaries can be maintained, different prices may be charged in different channels because "…the value bundle is well differentiated in the customers' eyes" (Rangan 2006, p. 192). However, as soon as customers fail to see meaningful differences in the channels' offerings, they will migrate to the lowest price channel. Therefore, maintaining price convergence is another way in which cannibalization and, hence, channel conflict can be limited (Rangan 2006).

Price differences, however, may stem from differences in costs—not just the costs of goods sold, but the costs of providing value-added services (e.g., personal selling support) to the customer. Suppliers can compensate for cost differences by reimbursing their distributors for these additional services (Rangan 2006). They can also develop ways of rewarding one channel for its role in generating sales (e.g., bricks-and-mortar store), even though the customer may have bought the product through another channel (e.g., internet) (Neslin and Shankar 2009).

In addition to managing the supply issues surrounding the use of multiple marketing channels, issues of demand also require attention. Verhoef et al. (2007) identified the research shopper—those customers who search for information about products and services in one marketing channel and subsequently make their purchases in another. Research shoppers represent the essence of cannibalization.

Verhoef and his colleagues described three steps for limiting research shopper behavior, thereby reducing the extent of cannibalization in multiple marketing channels.

One step is to make e-commerce more attractive for purchases "… by adding a real-time shopping assistant to improve service, and adopting and publicizing a transparent and strict privacy policy" (Verhoef et al. 2007, p. 142). Another step is to increase customer lock-in through effective customer relationship management (e.g., the Amazon.com CRM system that incorporates a "Wish List," "One-Click" shopping, and makes recommendations based on previous purchases). Such techniques make it easier for customers to stay at the website to buy rather than migrating to other channels for purchase. The third step is to reduce cross-channel synergy by implementing an isolation strategy. Because firms that adopt this strategy see multiple channels as being separate and distinct, they make no effort to move customers from one channel to another. Indeed, they make such migration difficult.

These measures for overcoming cannibalization assume that multiple channels do little to expand overall demand for the firm's goods and services. However, one important reason for embarking on a multi-channel marketing strategy is to gain the synergies possible by offering customers more than one way in which they can obtain their desired portfolio of marketing channel service outputs. In other words, a truly effective multi-channel strategy expands total demand for the firm by better satisfying its customers.

2.6 Shaping Multiple Channel Performance

Ultimately, firms employ multiple marketing channels to improve their levels of performance. The performance of a multi-channel system hinges on customer attributes as well as characteristics of the multi-channel system itself. We begin with customer characteristics.

2.6.1 Customer Characteristics

An important outcome for a multi-channel system is customer satisfaction, which occurs at several levels. For example, customers can evaluate their satisfaction with store employees, the store itself, its internet channels, and its telephone call center, according to which channel they patronize. Birgelen et al. (2006) found that, in the banking industry, these assessments of satisfaction can generate future patronage intentions, depending on whether customers' transactions involve routine or non-routine services. Customers can also assess their satisfaction with the transaction or purchase. Research has found that satisfaction with the purchase strengthens customer loyalty to the retailer, and this effect is stronger for multi-channel customers than single format buyers (Wallace et al. 2004).

Customers' experiences with one (or more) of the firm's channels can affect their reactions to the firm, in general, and its other channels, in particular. Montoya-Weiss et al. (2003) found that customers' assessments of service quality for both a firm's online and bricks-and-mortar stores positively influenced their levels of satisfaction with the retailer. Similarly, customers' positive attitudes toward one of the firm's channels (e.g., its e-commerce website) can favorably impact their intentions to shop through another of the firm's channels (e.g., its brick and mortar stores) (Kwon and Lennon 2009).

2.6.2 Channel System Characteristics

In addition to customer characteristics, characteristics of the marketing channel structure can affect the performance of the multi-channel system. For example, Lee and Kim (2010) found that customer loyalty to multi-channel firms can be shaped by the extent to which the firm integrates its multiple channels. In addition, customers of firms operating integrated multi-channel systems demonstrate greater unplanned purchase amounts and are more satisfied, as compared to firms whose multi-channel systems are not integrated (Chatterjee 2010).

One factor that enhances the integration of multi-channel operations is trust among the different channel organizations (e.g., customer support call center and brick-and-mortar store). Trust facilitates cooperation among these units, and more cooperation heightens the likelihood that these units will rely upon each other to provide their customers with the desired bundle of channel service outputs (cf. Weitz et al. 2004).

Further, the firm's capabilities for monitoring channel activities and providing incentives to align channel member interests produce higher levels of performance, especially when the firm operates complex multi-channel systems (Wallace et al. 2009).

2.6.3 Multi-channel Performance

How customers perceive each of the firm's multiple marketing channels and how well the firm can integrate its multi-channel operations affects the firm's performance. Quality customer service produces satisfied customers whose positive attitudes toward their experiences in one of the firm's channels spill over into their intentions to shop at the firm's other channels. The more the firm is able to provide a seamless experience to its customers through its integrated multiple channels, the higher its level of performance.

3 Channel Demand Environment

A firm's multiple marketing channels operate within at least two sets of market demand circumstances. In this chapter, we focus on: (1) the buying and selling processes, and (2) the channel life cycle. We start with the buying and selling processes.

3.1 Buying and Selling Stages

Buyers progress through a number of stages in their interactions with the firm and, with a multi-channel system, a firm's different marketing channels play different roles depending upon the buyer's particular stage in the buying process (Moriarity and Moran 1990; Raulerson et al. 2009).

The upper portion of Fig. 4 depicts the various stages of the buying process. Note that the buying process does not end with the purchase, rather it continues as the customer uses the product and may require support. Not shown is the feedback loop that occurs when the customer replaces the product or supplements it with additional products. Hence, a firm's multiple channels must be designed to handle these various stages of the customer buying process.

At the same time that buyers progress through the stages of the buying process, marketers move through the selling process, trying to match their customers' buying stages, as depicted in the bottom section of Fig. 4 (Raulerson et al. 2009).

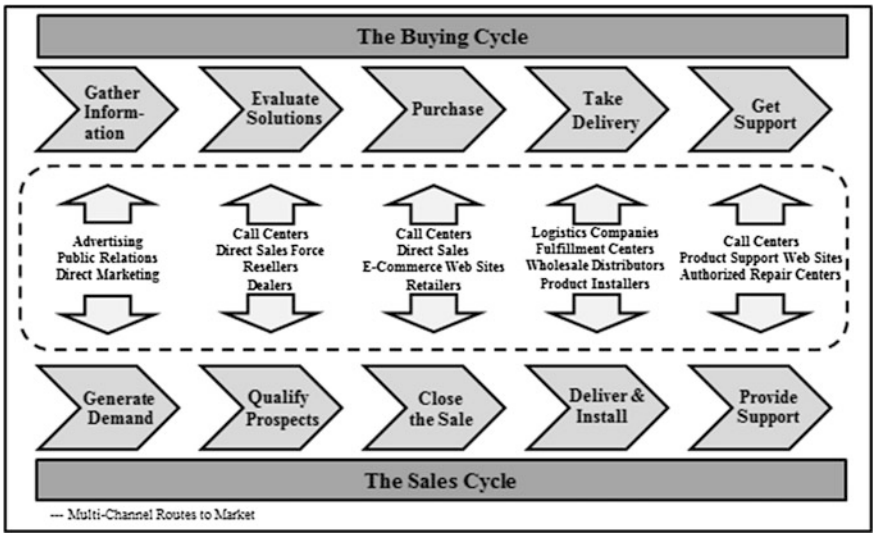

Fig. 4 Multi-channel pathways to markets throughout the buying and selling cycles (based on Moriarity and Moran 1990; Raulerson et al. 2009)

The firm's multiple marketing channels allow for this matching process to take place, as depicted by the middle portion of Fig. 4, which shows how various marketing channels interface with the different phases of the customer buying cycle and the marketer's selling process.

Clearly, these channels must be sufficiently integrated for the customer to obtain a satisfying portfolio of channel service outputs. The integration of the "front end" channels (i.e., those that generate customer knowledge, interest, and actual purchase) with the "back end" channels (i.e., those that provide delivery and product support) is particularly critical. Promises to the customer are made in the "front end" channels, but must be realized through the "back end" channels. If these promises are not met, the customer becomes dissatisfied and, in these days of online customer reviews, disseminates that dissatisfaction throughout the internet.

Different customers are arrayed in different buying stages, and customers in each segment have different needs and wants. For example, customers in the "information gathering" phase seek information about competitive brands and their relevant attributes. Those customers in the "take delivery" phase seek information about product delivery and are concerned about how best to install the product. Hence, the buying stages represent different market segments for the firm to target. The firm's different marketing channels are differentially equipped to satisfy these various needs. Customers' needs and wants are best served when they are seamlessly handed off from channel to channel they progress through the buying process.

3.2 Channel Life Cycle[1]

Just as the use of specific channels varies over the stages of the buying and selling processes, it also differs according to the life cycle stage of the market offering (Raulerson et al. 2009). The reason is that the firm's marketing channel tasks vary as the market offering matures.

In the introduction phase of the channel life cycle (Fig. 5), the key objective is to induce innovators and early adopters to purchase the product. Innovators—those who try new products because of their newness—and early adopters—those who seek new products to provide them with a relative advantage—comprise about 16 % of the total market. The firm's direct sales and e-commerce channels are effective ways of reaching these target customers in this phase of the channel life cycle.

In the growth phase, the goal is to begin the expansion of market coverage and to provide customers with a total market offering that completely satisfies their needs. The target market in this life cycle phase is the early majority which comprises about 34 % of the total market. This market segment tends to avoid risk

[1] This section is largely based on and adapted from Raulerson et al. (2009, Ch. 5).

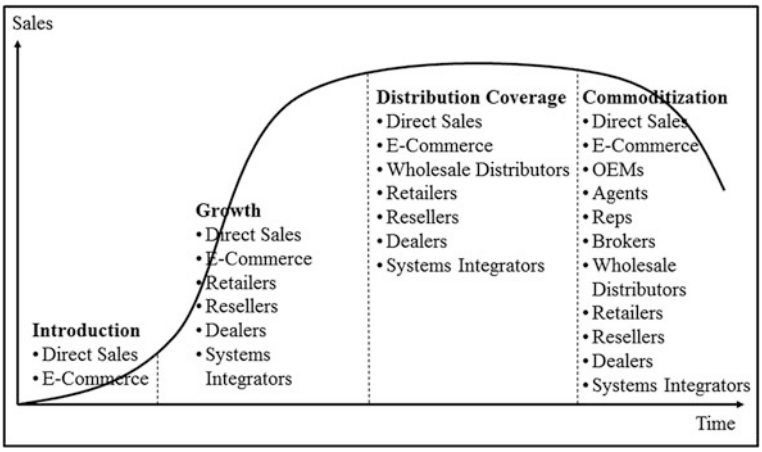

Fig. 5 Multi-channel pathways to markets: life cycle phases (*Source* adapted from Raulerson et al. 2009)

and, therefore, looks to tested solutions and channels that are able to absorb risk. Therefore, to reach this market and to serve its needs, additional channels are added and their integration begins.

To reach the next 34 % of the market—the late majority—the firm accelerates its expansion into additional marketing channels in the distribution coverage phase of the channel life cycle. Late majority customers are price- and solution-sensitive; they want products and services that have proven their worth and are not willing to buy innovations just to "lead the pack." They are also more likely to purchase through channels with which they are familiar and have had positive experiences.

The last phase of the channel life cycle is the commoditization of the product. In this phase the distribution coverage is at its broadest and the use of multiple channels is at its greatest in order to reach the remaining buyers. This final sixteen percent of the market is composed of those who are the last to buy and those who will never buy the product. In the later stages of the commoditization phase, because competition focuses on price and availability, cost pressures become high. As a result, the firm will "rationalize" its marketing channel system by eliminating those channels that no longer generate sufficient profits to justify their existence.

The three key tasks firms must perform during each phase of the channel life cycle are to: (1) operate the channels needed to accomplish the necessary tasks of the current life cycle stage, (2) develop the channels needed to accomplish the tasks of the next phase, and (3) plan for routes to market for the firm's next set of new products and services. In performing these tasks, firms must keep in mind that their customers look for a different portfolio of marketing channel service outputs throughout the product's life cycle.

3.3 Complexity of Market Demand Environment

The complexity of managing multiple marketing channels becomes apparent when the buying and selling processes are considered within each phase of the channel life cycle. At any one point in time, the firm will have customers in all phases of the channel life cycle and in all stages of the buying/selling process. The successful management of multiple channels compels firms to emphasize those segments that promise the greatest long-term potential returns on investment, and to develop additional such segments for the future.

4 Summary and Conclusions

We are living in an age of internet where e-commerce is as ubiquitous as the department store was in yesteryear. One consequence of e-commerce is that it has provided an additional marketing channel for reaching target markets. Thus, the twin goals of this chapter have been to map out the key aspects and components of the complex process of simultaneously managing multiple marketing channel systems and to describe the pivotal role played by e-commerce in facilitating its successful implementation.

Adopting a customer-centric perspective, we began this chapter by discussing those benefits that customers hope to obtain from the marketing channels that they patronize. We encouraged firms to recognize that their customers are heterogeneous in the channel service outputs they seek. Hence, firms can best serve different market segments by using different marketing channels or different combinations of marketing channels. The next imperative is that firms should ensure that their multiple channels systematically operate in a synchronized fashion to transmit a consistent value proposition to their customers through a well-devised multi-channel integration strategy. We caution against cannibalization and the resultant potential for channel conflict that can arise from vertical competition, goal incompatibility and distributor free-riding stemming from an ill-conceived multi-channel architecture. However, we posit that effective multi-channel integration can ensure minimal cannibalization and can generate superior multi-channel performance payoffs for all channel constituents. Finally, we recommended that channel decision-makers be cognizant of and accommodate the demand environment that confronts the firm's multiple marketing channels. Specifically, the complexities and the differential effects of the buying and selling stages and the channel life cycle stages cannot be ignored in designing a successful multi-channel system.

In the late 1990s, the term of disintermediation was coined and popularized to envision a future retailing landscape where internet-based businesses that sell their products directly to customers would eviscerate the traditional brick-and-mortar retail establishments. As noted before, not only has e-commerce not attained the

lofty position it was forecasted to achieve, increasingly, practitioners as well as academic scholars are beginning to subscribe to a more reasoned perspective that e-commerce has transformed the traditional depiction of distribution channels, but will not supplant its brick-and-mortar counterparts. This transformation is most evident in the arenas of provision of product information and execution of transactions. And, while it is true that no contemporary, respectable business can afford to be without a website, only a handful of e-commerce channels can provide the full gamut of service outputs that customers seek (i.e., locational convenience, temporal convenience, depth and breadth of assortment, desired and verifiable product quality and quantity, and support services like product information, provision of credit, and after-sales services) all bundled at a single point of contact. This situation therefore necessitates a multi-channel structure that provides different sets of utilities to the customer. Moreover, as also pointed out earlier, only a limited number of product categories lend themselves to a completely disintermediated transaction. Indeed, the emergent dogma seems to be one of re-intermediation where the traditional intermediaries will either rise to the occasion and learn new ways to add customer value that e-commerce is simply not capable of providing, or they will be replaced by new intermediaries that do.

Some examples of these new emergent intermediaries that excel in providing added value to the contemporary customers are Edmunds (edmunds.com), CARFAX (carfax.com), and iMotors (imotors.com). Edmunds.com provides consumers with a vast repertoire of information about cars, including price comparisons, ratings, location of cars for sale, and the dealer's true cost; carfax.com provides detailed results of research on specific used cars and informs customers of vehicles' past accident history or if their odometers were ever rolled back; and imotors.com offers its members discounts on insurance, gas, and repairs. The important thing to note is that these same channel service outputs could be provided by extant brick-and-mortar intermediaries.

Hence, e-commerce has not supplanted the extant intermediaries; it has merely forced them to redefine the channel service outputs they must provide to survive in this brave new world. This is the price of their survival.

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Pricing Strategies in the Electronic Marketplace

Jihui Chen

Abstract In this chapter, I review prices and firms' pricing strategies on the Internet through a broad survey of recent literatures on economics, information system, and marketing. In both empirical and theoretical studies, I carefully identify two causes of price dispersion, a pervasive and persistent phenomenon observed in many homogenous product markets: market friction and product differentiation. In experimental studies, I document pricing strategies arising from both laboratory and field experiments. Finally, recent studies of online pricing issues using international data are also exposited.

Keywords Pricing strategies · Price dispersion · Market friction · Product differentiation

1 Introduction

During the past two decades, the Internet has witnessed an era of the greatest development in e-commerce. Today, online retailing (e-retailing, hereinafter) is one of the fastest-growing sectors with a double-digit growth rate, and this trend is expected to continue. According to a recent Census Bureau report, e-retailing sales in the U.S. exceeded $145 billion in 2009, marking an annual growth rate of 18.1 % between 2002 and 2009, compared to only 2.2 % for total retail sales.[1] Figure 1 depicts the seasonally adjusted annual percentage changes in quarterly e-retailing sales, along with those in overall retailing sales, from 2000 to 2011.

[1] Table 1 presents percent annual changes in the top online merchandise categories between 2002 and 2009.

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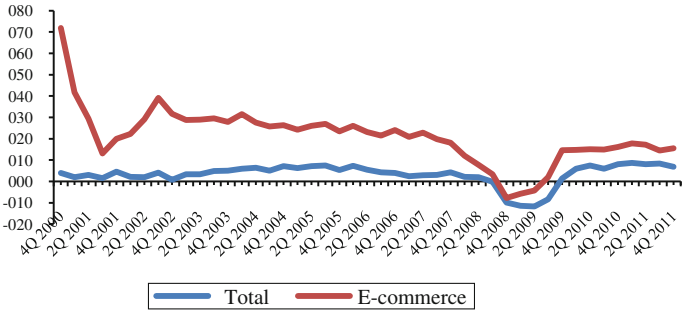

Fig. 1 Annual percentage changes in estimated quarterly U.S. retail e-commerce and total sales: 4th quarter 2000–4th quarter 2011 (*Source* U.S. Census Bureau, http://www.census.gov/retail/)

Table 1 Leading retail e-sales merchandise lines

	2009		2002		Annual E-sales percentage change
	Total	E-sales	Total	E-sales	
Merchandise lines[a]	233,530	113,332	122,631	33,485	34
Electronics and appliances	18,463	14,840	4,799	2,119	86
Sporting goods	7,087	4,897	2,833	1,031	54
Clothing and clothing accessories[b]	25,931	19,550	15,010	4,561	47
Drugs, health aids, and beauty aids	71,512	6,254	7,485	2,499	44
Nonmerchandise receipts	12,229	8,511	23,198	1,521	43
Furniture and home furnishings	13,262	9,797	4,896	2,120	42
Other merchandise	28,586	14,028	16,481	3,868	38
Music and videos	5,944	5,076	4,153	1,598	31
Food, beer, and wine	3,698	2,242	2,057	761	28
Toys, hobby goods, and games	5,866	3,596	3,741	1,321	25
Books and magazines	6,595	5,186	4,116	1,961	23
Computer software	5,621	3,172	4,418	1,229	23
Office equipment and supplies	7,217	5,449	6,544	2,600	16
Computer hardware	21,519	10,734	22,900	6,296	10

Source The 2003 and 2010 E-commerce multi-sector ***"E-Stats"***, U.S. Census Bureau, Table 6
Note [a] This table excludes the largest merchandise line, motor vehicles and parts dealers, which accounted for more than 80 % of total online retail sales
[b] Includes footwear

It suggests that while the growth of e-retailing sales slows down slightly in recent years, it is still substantially above that of overall retailing sales (Figure 1).

The rapid growth in e-retailing has provided researchers with rich ground for empirical and experimental studies and has also further stimulated theoretical research on firm behaviors. In this chapter, I review prices and firms' pricing strategies on the Internet, with a focus on price dispersion, through a broad survey of recent literatures on economics, information system, and marketing.

The remainder of this chapter is organized as follows. In Sect. 2, I discuss the evolution of e-retailing in the first decade of its development, and introduce some background information about pricing strategies.

In Sect. 3, I offer a comprehensive survey of the current empirical, theoretical, and experimental literatures on price dispersion and pricing strategies on the Internet. One focus of the discussion is price dispersion on the Internet, provided that a great deal of attention has been invested in examining the "law of one price," which argues that a frictionless market leads to price convergence. However, this law fails to hold in various industries from inexpensive homogenous goods such as books and music CDs to expensive differentiated goods such as automobiles and collectible antiques. In the remainder of the third section, I identify the sources of online price dispersion, mainly market inefficiency and product differentiation. I then complement the discussion with major contributions in both theoretical and experimental research.

In Sect. 4, I extend the discussion to include international online data. In Sect. 5, I discuss future research directions before offering some concluding remarks in Sect. 6.

2 Background

In this section, I review the initial development of e-retailing, focusing on the timing of Internet adoption, both in terms of product and firm types. Next, I introduce various pricing mechanisms in e-retailing and point out their positions as objects of study in the literature, laying out background information for the discussion of pricing strategies.

During the early days of e-commerce, (often inexpensive) search goods such as books and music CDs were among the first sold on the Internet, followed by (more expensive) differentiated experience goods (Daripa and Kapur 2001). Table 2 presents a few examples of how e-retailers have diversified product offerings to embrace the changing landscape on the Internet. For example, in online auctions, most traded items initially are considered "relatively inexpensive"; high-end collectibles such as art and antiques were introduced to the new platform at a much later time (Lucking-Reiley 2000). Both the rise of consumer confidence in e-retailing and technological advances are the main driving forces behind these evolutions.

While different industries apparently migrated to the Internet at different times, firms within the same industry also differed in the timing of Internet adoption. Table 3 reports the timeline of selected leading online industries (as indicated in Table 2). For example, in the apparel industry, owing to operation efficiency, vertically integrated firms (e.g., The Gap) tended to embrace this new form of distribution faster than non-integrated rivals (e.g., Nautica) (Gertner and Stillman 2001). However, the opposite was observed in the air travel market as airlines jointly created Orbitz.com in 2001, much later than the launch of carriers' own

Table 2 Firms' evolving product offerings

Company	Concept and initial product	Current products
Priceline.com	Selling surplus airline tickets online. Ticket buyers post the price they will pay for a seat on one of the major national airlines to travel between two cities on a specific day, providing a credit card number for the non-refundable fare. Participating airlines then decide whether to sell a seat at that price for any flight on that date	The airline ticketing concept that was used earlier has been extended to other products such as gasoline, home finance, new cars, rental cars, hotel rooms, and long-distance calls
eBay.com	An online auction site that enables individuals to buy or sell online	Diversified into customer service related to their product area such as insurance, authentication, dispute resolution, investigation, and escrow services. It also enables professionals to bid for posted projects
Davenporthouse.com	Selling English Country furniture online	Diversified into related areas. Started with furniture and later introduced related furniture accessories: English Country furniture, museum pieces, tea accessories, British food, kitchen, gift baskets, wedding-related accessories, English and French furniture-related books, and corporate gifts
Amazon.com	Online bookstore	Diversified into myriad products including electronics, hardware, housewares, toys, cars, and auctions
InternationalMale.com	Selling clothing for men	Diversified into other various products such as clothing, jewelry, bath, shoes, furniture, bedding, rugs, carpets, fit guides, and newsletters

Source Chellappa and Kumar (2005) Table 3 with modifications

sites and third-party vendor sites, including Expedia.com and Travelocity.com. Such differences in the adoption of e-commerce may be due to product differences and particularly the complexity of the ticket distribution system.

Moreover, in Table 3, online-only retailers (or DotComs) first emerged in some industries (e.g., the book and auction markets), followed by the online branch of multi-channel brick-and-mortar retailers (or MCRs), while the opposite is observed in other markets (e.g., the airline market).

Table 3 Timeline of firms' internet adoption

	1995	1996	1997	1998	1999	2000	2001 and beyond
Apparel[a]							
Specialty retailers	Eddie Bauer	L.L. Bean	Gap	American Eagle Outfitters	Abercrombie and Fitch	Ann Taylor	The Limited
			J. Crew		Talbot's	Benetton	
					Wet Seal		
Department Stores		J.C. Penny	Bloomingdale's	Macy's	Dillard's	Saks Fifth Avenue	May
				Nordstrom	Target Dept. Stores		
Vendors				Esprit	Guess	Polo Ralph Lauren	Calvin Klein (2008)
				Bugle Boy			Levi Strauss
							Nautica
							Phillips-Van Heusen
							Tommy Hilfiger
							VF Corp.
Air travel							
Carriers	Southwest	AA		Priceline	Jetblue	United	Orbitz (2001)
Agents		Delta				Hotwire	
		Northwest					
		Expedia					
		Travelocity					
Auction[b]							
	Onsale		uBid	Yahoo! Auctions (teamed with Onsale)	Amazon Auctions	Sotheby's	Christie's Live (2006)
	eBay						
Book	Amazon		B&N		eCampus		Borders (2008)

(continued)

Table 3 (continued)

	1995	1996	1997	1998	1999	2000	2001 and beyond
Electronics	Best Buy (1994) CDW	Radio Shack Dell PC Connection PC Mall	Systemax Buy.com			Newegg	
Entertainment	DirectTV	Dish Network Blockbuster		Tivo			
Hotel	Choice Hotels Best Western Carlson Hyatt Hilton Comfort Inn	Marriott Holiday Inn				Accor Group	Intercontinental Hotels Group (2003) Wyndham (2006)
Mass Merchant		Amazon Walmart		Costco Kohl's	Sears Overstock		
Office Supplies	OfficeMax Staples Office Depot	ABC Office					

Note

[a] The timeline of apparel firms' Internet adoption is reproduced from Table III in Gertner and Stillman (2001, p. 431) with modification

[b] These auction sites were among the largest as of August 1998 (Lucking-Reiley 2000, p. 230, Table II)

Amidst these changes, three pricing mechanisms emerged on the Internet, namely, the set price mechanism, auctions, and the negotiated price mechanism (Dolan and Moon 2000).[2]

The first mechanism is the most common in the marketplace: the seller sets a fixed price and the buyer makes a "take-it-or-leave-it" decision. Empirical studies often compare prices between online and traditional markets, which focus on the hypothesis that efficient online search leads to lower prices and price dispersion (see Sect. 3.1.1).

Horizontal competition among buyers (sometimes sellers) is a unique feature in auctions. The highly interactive nature of the Internet has led to the popularity of online auctions, as it has significantly lowered the costs associated with matching potential sellers and buyers. eBay and Yahoo! Auctions are among the most popular auction websites (see Table 3), and Internet keyword auctions hosted by Google, for example, are the latest development. Among others, the most notable difference between live and online auctions is the end-of-auction rule. The implementation of the hard ending times used online has invited considerable inquires about its consequences (see Sect. 3.1.2).

Under the third mechanism, one-on-one negotiations between the seller and the buyer are involved, for example, in online auto sales. This pricing mechanism differs from auctions in that it involves competition between the individual seller and buyer, or at different levels of the marketing system, rather than competition among buyers (or sellers in reverse auctions),[3] or within the same level of the system.

In the next section, I discuss in detail how e-retailers employ these pricing mechanisms through a comprehensive survey from three perspectives: empirical, theoretical, and experimental.

3 Empirical, Theoretical, and Experimental Literatures on Online Pricing Strategies

3.1 The Empirical Literature

With the advance in information technology, researchers have been increasingly taking advantage of abundant data available on the Internet. The majority of these studies collect posted prices, with a few exceptions that analyze actual transaction data (Goolsbee 2001; Sengupta and Wiggins 2007; Ghose and Yao 2011;

[2] Dolan and Moon (2000) discuss some interesting examples of each pricing mechanism, some of which have since evolved into different business models.

[3] In reverse auctions, sellers bid to fulfill a demand specified by the buyer (Dolan and Moon 2000). Priceline.com and other "name-your-own-price" websites adopt this business model (Sect. 3.3.2).

Granados et al. 2012). In general, empirical studies on Internet pricing mainly focus on three areas: price levels, price dispersion, and price dynamics (both inter-firm and intra-firm over time). To tackle these pricing issues, the existing literature typically takes one of the following approaches.

- One strand of the literature compares these pricing issues between brick-and-mortar retailers and online retailers (e-retailers). Lower online search costs should promote fierce competition and thus lead to lower and less dispersed prices (Bakos 1997; Brynjolfsson and Smith 2000). With the aid of price comparison websites, or "shopbot", consumers are able to conduct efficient searches for the best deals. In addition, the Internet also allows competing firms to be informed of rivals' prices and pricing strategies. In this way, competition is expected to be enhanced. Furthermore, due to low menu costs, one should expect e-retailers to adjust prices more frequently than their offline counterparts.
- The second strand compares between Dotcoms and the online branch of MCRs. Two factors should drive the differences between these two types of retailers: lower menu costs on the Internet and channel conflict. Thus, one should expect Dotcoms to charge lower and less dispersed prices and more frequent price adjustments than MCRs.
- The third strand focuses on differences between producers/manufacturers websites and third-party reseller websites.[4] Here, two possible outcomes exist: one prediction is that the former group charges higher prices because of its captive loyal consumer base; the other is that the latter group charges higher prices because of the added costs (e.g., commission or the "double-marginalization" problem).

As indicated in Tables 4 and 5,[5] empirical evidence appears mixed. On the one hand, while some studies find lower and less dispersed online prices, others do not.[6] Early studies generally find higher online prices, most likely due to market immaturity and the composition of early adopters to , but more recent studies have suggested otherwise. On the other hand, most studies document lower and less dispersed prices on than on , with a few indicating rather comparable prices and price dispersion between the two types, sometimes even with the opposing evidence. Nevertheless, whether the Internet has brought about frictionless competition remains to be explored.

[4] There exists some overlap between the last two strands of the literature, in the sense that producer/manufacturer websites (e.g., American Airlines' AA.com) can be viewed as the online branch of MCRs while third-party reseller websites (e.g., Expedia.com) are Dotcoms.

[5] A few studies include all three types: DotComs, MCRs, and offline retailers (Ancarani and Shankar 2004), which offer additional insights on channel presence and channel pricing.

[6] See Ancarani et al. (2009) for a summary of studies on price sensitivity, which generally suggest that online shoppers are less price sensitive as they receive more non-price product information than offline shoppers. This finding indicates another possibility of higher online prices in some markets.

Table 4 Empirical studies compare online and offline retailers' pricing strategies

Article	Data duration	Product category	Main findings	
			Price level	Price dispersion
Bailey (1998)	1996–1997	Books, CDs, software	Higher online	Higher online
Brynjolfsson and Smith (2000)	Feb 1998–May 1999	Books, CDs	Lower online	Higher online
Garicano and Kaplan (2001)	1999–2000	Used-cars auctions	Higher online	
Scott Morton et al. (2001)	Jan 1999–Feb 2000	New cars	Lower online	Lower online
Lee and Gosain (2002)	Feb 1999–Jan 2000	CDs	Comparable (current-hits)	Comparable
Clay et al. (2002)	Apr 1999	Books	Comparable	Higher online
Brown and Goolsbee (2002)	1992–1997	Life insurance	Lower online	Lower online
Kazumori and McMillan (2005)[a]	Jun 2002	Art auctions	Lower online	
Stylianou et al. (2005)	Sept 2002–Apr 2003	Over-the-counter pharmaceuticals	Lower online	Higher online
Zettelmeyer et al. (2006)	Apr–May 2002	New cars	Lower online	
Cooper (2006)	Nov–Dec 2004	Disposable contact lens	Lower online	Lower online (nearly zero online)
Chellappa et al. (2011)	3rd quarter 2004	Airfares		Lower online
Sengupta (2007)	2004	Airfares		Lower online
Ghose and Yao (2011)	Jan–Dec 2000	Service supply products		Lower online
De los Santos (2011)	May 2007–Apr 2008	Hotel	Higher online	
Granados et al. (2012)	Sep 2003–Aug 2004	Airfare (transaction data)	Lower online	

[a] Unlike other studies in the table, Kazumori and McMillan (2005) do not compare matched items between online and live auctions

Table 5 Empirical studies compare Dotcoms' and MCRs' pricing strategies

Article	Data duration	Product category	Main findings	
			Price level	Price dispersion
Carlton and Chevalier (2001)	June, Oct 2000	Fragrances, DVD players, and refrigerators	Dotcoms lower	
Tang and Xing (2001)	July–Aug 2000	DVDs	Dotcoms lower	Dotcoms lower
Pan et al. (2002)	Nov 2000	Books, CDs, DVDs, computer software and hardware, electronics	Dotcoms lower (for some products)	
Dewan and Hsu (2004)	Jan and Sept 2000	Stamps	Dotcoms lower	
Xing and Tang (2004)	July 2000–June 2001	DVDs	Dotcoms lower	Dotcoms lower
Xing et al. (2004)	Dec 2000–Apr 2001	Electronics	Dotcoms higher	Dotcoms lower
Tang and Gan (2004)	Oct 2000–Jan 2001	Toys	Comparable	
Xing et al. (2006)	July 2000–June 2001	DVDs	Dotcoms lower	Dotcoms lower
Gan et al. (2007)	Sept 2004–Jan 2005	Groceries	Comparable	Dotcoms higher
Xing (2008)	Jul 2000–May 2003	DVDs	Comparable (over time)	Comparable (over time)
Xing (2010)	Jul 2000–Jul 2002	DVDs	Comparable (over time)	Comparable (over time)

3.1.1 Price Dispersion

The topic of the "law of one price" is probably the most studied in the literature on online pricing. However, the law often fails to hold (Varian 1980), due to various factors. For example, in the pre-Internet era, consumers had limited means to conduct effective comparison shopping but relied on traditional media such as Sunday newspapers (Baye and Morgan 2001) and/or on physical trips from one store to another. Thus, price dispersion arises from search-cost differences among consumers.

The advent of the Internet has dramatically altered the ways in which sellers and buyers transmit and gather information about products and prices, alleviating the problem of incomplete information. On the demand side, the introduction of shopbots eases the burden of consumer search thereby exerting downward pressure on prices. On the supply side, reduced entry barriers and menu costs allows sellers to update prices easily, and, coupled with increasing consumer search, intensifies market competition. Taken together, one might expect prices to converge in the new economy.

In the literature, researchers have developed several measures of price dispersion, which I summarize below (in decreasing order of their usage).

- Price range: defined as the difference between the maximum and minimum prices in a given market.
- Percentage price range: defined as the ratio of price range to the mean unit price that is averaged across all products in a given market (Cooper 2006; Chiou and Pate 2010, Table 4, p. 302).
- Difference as fraction of average unit price: defined as the ratio of the difference between the maximum and minimum prices to the mean unit price, which is averaged across all products in a given market (Clay et al. 2001, Table VII, p. 362).
- Coefficient of variation: defined as the ratio of the standard deviation to the average price in a given market (Chiou and Pate 2010, Table 4, p. 302).
- Standard deviation as fraction of average unit price: defined as the ratio of standard deviation to the mean unit price that is averaged across all products in a given market (Clay et al. 2001, Table VII, p. 362; Chiou and Pate 2010, Table 4, p. 302).
- Price gap: defined as the difference between the two lowest prices in a given market (Baye et al. 2004a).
- Value of information: defined as the difference between the average observed price and the lowest observed price in a given product market (Baye 2006b, p. 38).
- Gini: defined as $Gini = 1 + \frac{1}{N} - \frac{2}{\lambda N^2}\sum_{i=1}^{N}(N + 1 - i)p_i$ where p_i is the price of observation i, with $i = 1,2,\ldots, N$, λ is the mean price. The Gini log odds ratio is then defined as $LGini = \log[Gini/(1 - Gini)]$(Gaggero and Piga 2011, p. 559, Footnote 9).

- Atkinson index: defined as
$$\begin{cases} 1-\frac{1}{\lambda}\left(\frac{1}{N}\sum_{i=1}^{N}p_i^{1-\phi}\right)^{\frac{1}{1-\phi}} & for * \forall\phi > \gtrless * \ \alpha\nu\delta \ * \varnothing \neq \varnothing \\ 1-\frac{1}{\lambda}\left(\prod_{i=1}^{N}p_i\right)^{\frac{1}{N}} & for \ * \varnothing = \varnothing \end{cases}$$
where $p_i$is the price of observation i, with $i = 1,2,\ldots, N$; λ is the mean price; and ϕ is the choice parameter (Gaggero and Piga 2009, p. 8, Footnote 14).
- Entropy index: defined as $= \begin{cases} \frac{1}{N}\left(\sum_{i=1}^{N}\left[\left(\frac{p_i}{\lambda}\right)^{\phi}-1\right]\right) & for\ \forall\phi > 0 and \phi \neq 1 \\ \frac{1}{N}\sum_{i=1}^{N}\left(\frac{p_i}{\lambda}\right)^{\phi} ln\frac{p_i}{\lambda} & for \phi = 1 \ or \ \phi = 0 \end{cases}$
where p_i is the price of observation i, with $i = 1,2,\ldots, N$; λ is the mean price; and ϕ is the choice parameter (Gaggero and Piga 2009, p. 8, Footnote 14).

A majority of empirical studies in this strand of the literature examines the relationship between search costs, price levels, and price dispersions across online and offline channels from inexpensive search goods (e.g., books and CDs) to expensive experience goods (e.g., airfares and consumer electronics).[7] Sorted by product category, Table 6 presents the evidence of price dispersion from selected studies using the two most commonly used measures, percentage price range and coefficient of variation.

Price dispersion is a ubiquitous and persistent phenomenon,[8] but several studies show that it declines over time.[9] Table 6 offers a brief overview of the dynamics in price dispersion using different measures by product category. Although the studies use different sets of data, they provide a general trend. Ratchford et al. (2003) note that online dispersion declines for eight product categories over a one-year period in their sample. In the airline industry, for another example, Clemons et al. (2002) find fare differences of up to 28 % in 1997, while Chen (2006) finds virtually no difference in airfares using data collected five years later, due to increased competition, mainly from carriers' own Websites. In the DVD markets, Xing (2010) suggests that both average prices and the level of price dispersion decline between July 2000 and July 2002. In a related study, Xing (2008) compare multi-channel retailers and online-only retailers using DVD data collected between

[7] Daripa and Kapur (2001) provide an excellent summary of possible explanations for the observed evidence of price dispersion in the early days of e-commerce.

[8] Baylis and Perloff (2002) also examine intertemporal price dispersion and conclude that "high-price firms remain high-priced and low-priced firms remain low-priced."

[9] Ghose and Yao (2011) use transaction prices and find near-zero online price dispersion in their business-to-business Federal Supply Service (FSS) data. They argue that listing prices used in most studies might have overestimated the level of price dispersion "(b)ecause a sale could only have occurred at the lowest posted price, none of the higher posted prices might have actually resulted in a sale." Yet, this statement is not entire true, as other factors such as branding effects will indeed entice consumers to purchase from higher posted prices.

Table 6 Empirical studies on online price dispersion

Article	Data duration	Percentage difference	Coefficient of variation	Product category
Clemons et al. (2002)	1997	Up to 28		Airfares
Chen (2006)	2002	1–2		Airfares
(Sin et al. 2007)	2004	30–46		Airfares
Chellappa et al. (2011)	2004	30–46		Airfares
Bailey (1998)	1997–1998		7.07–17.61	Books, CDs, software
Brynjolfsson and Smith (2000)	1998–1999	25–33		Books, CDs
Clay et al. (2001)	1999–2000	32–65	12.9–27.7	Books
Clay and Tay (2001)	2001	23–42		Books
Clay et al. (2002)	1999	27–73		Books
Ratchford et al. (2003)	2001	15.01–48.08	5.46–16.63	Books, CDs, consumer electronics
Pan et al. (2003a, b)	2000–2003	25.70–51.04	7.03–27.1	CDs, consumer electronics
Baylis and Perloff (2002)	1999	29.00		Cameras, scanners
Scholten and Smith (2002)	2000		5.72–28.40	Multiple consumer products
Baye et al. (2003)	2000–2001	40[a]	10	Consumer electronics
Baye et al. (2004a)	1999–2001	57[a]	12.6	Consumer electronics
Gatti and Kattuman (2003)	2001–2002	19.9–33.4	8.5–12.6	Consumer electronics
Scholten and Smith (2002)	2000		12.87–14.5	Grocery, Books, Flowers, Consumer Electronics
Ellison and Ellison (2005)	2000	4.00[b]		Computer memories
(Chiou and Pate 2010)	2005–2006	4–8		Giftcard (auctions)
Jin and Kato (2006)	2001–2002	33–51		Ungraded baseball cards (auctions)
Ghose and Yao (2011)	2000	0.22		Service supply products

Source Ghose and Yao (2011) Table 1 on p. 4 with modifications

Note

[a] Price range relative to minimum price, not the average price

[b] Price range between the lowest and the tenth lowest price

2000 and 2003. While he observes differences in prices and price dispersion between two types of e-retailers in 2000, such discrepancies diminish over the three-year span.

More recently, Chiou and Pate (2010) find price dispersion in gift cards for large retailer stores sold at eBay auctions ranges between 4 and 8 % of the average price, a much smaller level than those documented in non-auction markets (Table 6). "Note that in eBay auctions, the sellers do not discount the cards themselves; the different prices arise from the different winning bids for these identical items" (Chiou and Pate 2010, p. 297). This unique market setting allows them to investigate the effect of "cross-bidding" (Anwar et al. 2006) on price dispersion as consumers participate in multiple auctions either concurrently or intertemporally.

What are the main factors driving the observed price dispersion? In general, two sources are identified: market friction and product differentiation. On the one hand, transaction costs still exist online, despite reduced consumer search costs. On the other hand, e-retailers are innovative about using various strategies to differentiate themselves from competitors.

3.1.2 Market Friction

The Internet does not bring the "frictionless" market, "where buyers and sellers have complete information about each other, the market-clearing price and product characteristics" (Bailey et al. 2007). Market inefficiency and lack of transparency in prices hinder consumers' ability to conduct effective searches (Lal and Sarvary 1999). The use of shopbots does not necessarily reduce search costs. Ireland (2007) shows that multiple price listings from the same seller may contribute to the observed large price dispersion at shopbots. Here are several interesting pricing strategies relating to shopbots:

- E-retailers sometimes "engage in obfuscation—practices that frustrate consumer search or make it less damaging to firms" (Ellison and Ellison 2009). Ellison and Ellison (2009) describe a "bait and switch" (or "loss-leader") pricing strategy in the online computer memory market where retailers use low prices to lure consumers to visit their websites but later to steer them towards higher-priced items. In the online book industry, e-retailers tend to offer fairly deep discounts on bestsellers, but not on random books, hoping shoppers of bestsellers will purchase additional items "at full or nearly full price" (Clay et al. 2002, p. 364).
- Baye et al. (2004b) describe a "hit and run" pricing strategy in which firms use "short-term price promotions undertaken at unpredictable intervals" to (1) "not only precludes rivals from being able to exploit predictable pricing strategies," (2) "but also enables firms to price discriminate over time, even when market forces preclude price discrimination at each point in time." Such strategies are effective given the high unpredictability, of course at the expense of complete consumer search.

Furthermore, substantial entry barriers still exist, preventing the online market from becoming perfectly competitive. Several studies on the airline industry examine the relationship between prices and market structure. Chen (2006) studies the role of market structure in pricing strategies: price quotes are significantly higher if a certain flight is only available at one website than at multiple sites. More recently, Bilotkach and Pejcinovska (2012) reexamine the effect of structure of the distribution market on prices and reach a similar conclusion in their 2006 sample of fifty large U.S. airline markets. Such an effect becomes more pronounced in more concentrated routes. Other related studies, Bachis and Piga (2011) and Gaggero and Piga (2011), both confirm the negative relationship between competition and price dispersion using data from six European countries. In addition, Garrero and Piga (2011) also find such an effect is more prevalent during off-peak travel periods. Finally, Orlov (2011) finds average airfares decrease with Internet penetration, especially in the most competitive markets.

In the online book market, Tang et al. (2010) shed light on the relationship between market structure and pricing: both price and price dispersion decreases with the number of well-known retailers in the market. One advantage of this study is the use of actual observation of consumer search, a rare treatment in the literature.

Finally, shopper composition is another cause of market friction. Degeratu et al. (2000) and Lynch and Ariely (2000) find lower price elasticity online with groceries and premium wines in the early days of e-commerce. It is possible that early adopters of e-commerce were more affluent and thus less price sensitive. We would expect that online shoppers become more sophisticated at searching for deals over time.

Granados et al. (2012) analyze airfare transaction data collected from global distribution systems (GDSs).[10] They exclude tickets sold through airline direct sales. One interesting feature of their sample is that the authors distinguish between "transparent" and "opaque" online travel agents (OTAs).[11] Among other reasons, they find lower online prices in general because of different consumer bases between the two distribution channels: leisure travelers are more likely to use the online channel compared to business travelers. Furthermore, they find more elastic demand on "opaque" OTAs than on "transparent" OTAs, as one would expect.

[10] One advantage of this study is the use of transaction data rather than posted prices, adding credibility to the findings. Previous studies often use sales rank data as a proxy (e.g., Brynjolfsson et al 2003; Chevalier and Goolsbee 2003; Ellison and Ellison 2009; Baye et al., 2004a).

[11] Note that Hotwire has since changed its business model from the latter to the former.

3.1.3 Product Differentiation

Price dispersion can also be caused by heterogeneity in product through product differentiation. Many websites offer "freebies" including product comparison tools and user reviews, which are not part of the price but definitely play a role in pricing (Chellappa and Kumar 2005).[12] From this perspective, a product sold online becomes a bundle of the base product and add-ons. In this way, online purchase is a package of experience.[13]

First, the final price is usually partitioned into two parts: the base price and add-on prices such as shipping and handling fees. Even with an inexpensive homogenous product, e-retailers may well differentiate from each other through varying add-on pricing.

In fact, e-retailers have experimented with various forms of free shipping promotions. Amazon, for example, varied the requirements of minimum purchase for free shipping before it eventually settled on $25. We also observe that some e-retailers have phased out the free shipping promotion entirely over time and only offer free shipping during particular shopping periods such as holiday seasons. In a way, these retailers price discriminate consumers intertemporally on shipping charges. Dinlersoz and Li (2006) study shipping strategies and conclude that firms with low prices offer high quality shipping services such as short delivery time and low shipping fees.

Second, e-retailers promote differentiated strategies through additional services such as delivery options, customized recommendations, and free customer/expert reviews (Chellappa and Kumar 2005). For example, Baye and Morgan (2003) document "red queen" pricing effects through the use of a third-party sponsored mechanism (i.e., the Cnet Certified Merchant program) using electronics data collected from Shopper.com. However, when other firms also join the program, the premium associated with such differentiation strategies diminishes. In addition, participating in shopbots leads to product differentiation among otherwise identical retailers (Iyer and Pazgal 2003).

Product popularity also plays a role in price disparity. Lee and Gosain (2002) note that Internet prices are higher for more popular products than offline prices, but the opposite holds for less popular items. This observation generally holds in other studies (e.g., Liu and Tang 2005 on Chinese book markets). More recently, Bailey et al. (2007) argue that e-retailers with high traffic typically charge lower prices than those with low traffic.

Next, I discuss in detail additional strategies of product differentiation, including brand loyalty and reputation, channel substitution and most-favored customer clauses.

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[12] See Clay et al. (2002) for a discussion of non-price strategies.

[13] Bailey et al. (2007) argue that "if a consumer is not just buying a homogeneous good, but is in fact buying a bundle of a good plus service, then firms that offer higher quality service can charge higher prices." These arguments can be justified in the empirical literature (see, for example, Baylis and Perloff 2002; Clay et al 2002).

Brand Loyalty and Reputation

Smith and Brynjolfsson (2001) are among the first to study brand loyalty on the Internet.[14] They study Web traffic to a book shopbot, EvenBetter,[15] in the fall of 1999, including both one-time and repeated book buyers. They show that consumers using the shopbot value brand names, which are used as a signal of quality service.

Luo and Chung (2010) use the rating scores provided by Bizrate.com to measure store reputation and find that stores with higher scores charge a price premium, which becomes more pronounced for more expensive products in the online consumer electronics market. They also find asymmetry in pricing strategies between stores with different reputations; less-reputable stores are less likely to adopt a randomization strategy.

Channel Substitution

Evidence suggests prevalent channel substitution in various markets.[16] Goolsbee (2001) uses actual computer purchase data to estimate price sensitivity to buying channel options—online versus offline sales—and concludes that one should not regard these two types of markets as completely separated given the considerable competition between the two channels.

In the airline market, Sengupta and Wiggins (2007) use both online and offline ticket transaction data and show that the rise of online purchases lowers overall airfares but has a larger impact on tickets sold in the traditional market.

In the computer market, Prince (2007) argues that channel substitution began in 1998 using three-year survey data on PC purchases. The cross-price elasticity prior to 1998 is zero, while that for 1998 is approximately 3.0. Empirical analysis suggests that supply-side factors prevail in explaining the change, or it is due to the new business models adopted by the industry in late 1997.

Previous studies cite higher online prices due to shipping and handling costs but often ignore the inclusion of offline transportation costs (Ancarani and Shankar 2004). To fill in the gap, Forman et al. (2009) directly measure the effect of channel substitution using data from Amazon.com and show that offline entry in

[14] Using household Web browsing records between December 1998 and December 1999, Waldfogel and Chen (2006) find supportive evidence of the increasing visits to unbranded sellers because of such price comparison sites. The conclusions from these two studies may not necessarily conflict with each other in that Smith and Brynjolfsson (2001) focus on book purchases while Waldfogel and Chen (2006) on Web browsing for different merchandises in general, including books. Like most studies in the literature, neither study observes actual purchases, but only browsing behavior of consumers.

[15] EvenBetter.com became part of DealTime.com as of May 19, 2000 (Smith and Brynjolfsson 2001).

[16] Ghose et al. (2006) study another type of substitution—whether the used book market cannibalizes the demand for new books. Interestingly, they argue, based on empirical analyses on book sales on Amazon.com, that used books are not an substitute for new books for readers using Amazon. On the contrary, the introduction of used book markets facilitates new book sales and leads to an increase in total annual social welfare of nearly $87.92 million, according to their estimation.

the book market negatively affects the probability of buying online and the effectiveness of online price discounts.

Most-Favored Customer (MFC) Guarantees

Firms in traditional markets sometimes offer most-favored customer (MFC) guarantees in various forms. For example, under "retroactive" MFC clauses, firms promise to refund consumers the difference should the price of the good in question fall after the purchase. Standard theory suggests that retroactive MFC clauses raise prices, thus reducing price dispersion (see Cooper 1986; Hviid and Shaffer 2010; Schnitzer 1994). Under "contemporaneous" MFC clauses, firms cannot price discriminate among consumers. In contrast to retroactive MFC clauses, contemporaneous MFC clauses are often found to facilitate competition (see Degraba 1987; Besanko and Lyon 1993).[17]

In the airline market, in 2008, Orbitz launched a type of MFC guarantee, or "Orbitz Price Assurance."[18] Bilotkach and Rupp (2009) estimate the effect of this event and find that MFC programs enhance competition. In the consumer electronics market, Chen and Liu (2011) also find support for this theoretical argument.[19]

Sin et al. (2007) focus on two low-price carriers, Southwest and Jetblue, using both posted and transacted prices. They find that these two carriers do not use the price discrimination device of major carriers, except for the use of advance purchase discount, or a consistency pricing strategy. They explain that these carriers opt out of using OTAs because their prices are the lowest in the market only 26 % of the time, which would contradict their perceived "low-price" image, although they do usually have relatively low prices.

Again, in the airline market, Chellappa et al. (2011) indicate that price formats, namely, "everyday low price" (EDLP) and "promotional pricing" (HILO/PROMO), play a significant role in determining price disparity, even after controlling for factors affecting airline price differentials.

3.1.4 Online Auctions

Any discussion of Internet pricing would be incomplete without discussing auctions. Online auctions provide rich data for researchers to test a large number of

[17] See Chen and Liu (2011) for a detailed discussion of this literature.

[18] The other two OTAs did not follow suit, but Priceline adopted the same MFC guarantee in the spring of 2009 (Bilotkach and Rupp 2009).

[19] The difference between these two studies is while Bilotkach and Rupp (2009) find that competing OTAs actually raise prices after the Orbitz's incident, Chen and Liu (2011) note the opposite pricing behavior by Best Buy's major rivals after the event, which may be driven by distinct characteristics of the airfare and consumer electronics markets.

theoretical predictions made in the literature on auction. Here I briefly review two pricing-related topics of this literature.[20]

Having a "hard closing time" marks a key difference between online and live auctions (Hasker and Sickles 2010), inducing late-minute bidding (or sniping) prevalent on the Internet. One explanation is that sniping may strategically mitigate competition among bidders and thus lead to lower winning prices (Roth and Ockenfels 2002; Schindler, 2003). However, both Gonzalez et al. (2009) and Wintr (2008) fail to find supportive evidence in more recent eBay data.

Asymmetric information is another important issue in online auctions where deals are sealed without physical inspection or interpersonal interactions. Fearing the risk of being defrauded, consumers may bid less if quality uncertainty is a concern. Comparing prices of identical stamps between a reputable auction site, Michael Rogers, Inc. (MR), and eBay, Dewan and Hsu (2004) find a 10–15 % adverse selection discount on eBay, despite its seller rating mechanism, which seems to have only a modest effect on auction outcomes. Furthermore, Kazumori and McMillan (2005) provide supportive evidence from the art auction data that live auctions are more likely to result in higher final bid prices.

eBay instituted various measures to alleviate the asymmetric information problem, from the use of feedback system and Paypal to the more recently implemented listing of percentage negative feedbacks (Hasker and Sickles 2010). Do such reputation mechanisms work in online auctions? Empirical evidence seems mixed. For example, while Houser and Wooders (2006) find positive relationship between reputation and winning bids, Andrews and Benzing (2007) argue that reputation may not necessarily lead to higher sales prices.

The conflicting evidence cited above indicates the need for further research. While bidder decisions are relatively well understood in the literature, the research on sellers' choices is still underdeveloped (Hasker and Sickles 2010). Another strand of online auctions runs field/laboratory experiments (sometimes a combination of the two), which will be discussed Sect. 4.

In summary, Sect. 3.1 reviews pricing strategies documented in the existing empirical literature and two main sources of the observed online price dispersion: market friction and product differentiation.

3.2 The Theoretical Literature

In this section, I review several theoretical models developed to explain price dispersion emerging from different product markets. Most theoretical predictions about firm pricing behaviors based on the traditional market still apply to the

[20] Interested readers may refer to Pinker et al. (2003), Bajari and Hortacsu (2004), Ockelfels et al. (2006), and Hasker and Sickles (2010) for a systematic survey of this fast-growing literature.

online setting. A considerable portion of the theoretical literature on Internet pricing strives to explain why the "law of one price" fails to hold.[21] Among others, Baylis and Perloff (2002) propose several theories of price dispersion: immature markets (Brynjolfsson and Smith 2000), oligopolistic strategies (Baye and Morgan 2001), service premiums (Varian 1999), and price discrimination (Salop and Stiglitz 1977). As Baye et al. (2006b) conclude,

> (t)here is not a 'one-size-fits-all' model of equilibrium price dispersion; different models are appropriate for analyzing different market environments. For instance, search-theoretic models are most appropriate for analyzing environments where consumers must visit different stores or firms' websites to gather price information. Clearinghouse models are appropriate when consumers are able to access a list of prices (for example, in a newspaper or at a price comparison site).

Following the same approach in Sect. 2, I focus the discussion on two aspects: market friction and product differentiation. I conclude the section with other theoretical developments in the field.

3.2.1 Market Friction

A number of clearinghouse models explain the existence of equilibrium price dispersion in the online market. The seminal work by Baye and Morgan (2001) incorporates both search and advertising models (e.g., Diamond 1971; Reinganum 1979; Rosenthal 1980; Varian 1980; Burdett and Judd 1983) and considers a monopoly "information gatekeeper" (i.e., a shopbot) serving firms in the product market, through which firms may broaden market reach. Baye and Morgan (2001) show that the monopoly gatekeeper has an incentive to distort the fees it charges firms to list prices at its site. Thus, firms do not always participate in advertising at the gatekeeper. In equilibrium, the presence of the gatekeeper leads to price dispersion in the product markets it serves. Both the gatekeeper and firms in the product market charge prices above marginal cost and earn positive profits. Social welfare is higher than the case where the gatekeeper is absent, but lower than the social optimal level.

A stream of theoretical considerations extends the Baye and Morgan model, taking into consideration different aspects of online price competition. For example, Chen (2008) and Chen and Liu (2013) introduce the element of vertical integration into the Baye and Morgan framework. These models reflect the developments in a number of online markets where dominant firms launch joint ventures (e.g., Pressplay and MusicNet in the music industry and Orbitz in the air travel industry) that were later spun-off. Lin (2007) extends the Baye and Morgan model by introducing competing price comparison sites. While the preceding studies all assume symmetric pricing and advertising equilibrium strategies,

[21] Interested readers may refer to Baye et al. (2006b) for an excellent survey on price dispersion on the Internet, which provides the details of relevant models.

Arnold et al. (2011) consider market asymmetry across firms and show that those with fewer loyal customers tend to advertise more frequently but charge higher prices than firms with more loyal customers. These predictions are largely consistent with observations from shopbots such as shopper.com.

In addition, firms sometimes engage in various obfuscation strategies (Ellison and Ellison 2009). For example, consumer search can be less effective in the presence of multiple listings by the same seller or firms within a joint venture. Ireland (2007) shows that higher average prices in mixed strategy equilibrium due to incomplete consumer search. Even with the aid of shopbots, complete search is still infeasible given the overwhelming amount of information available on the Internet, giving rise to possible collusion among firms.

Hagiu and Jullien (2011) explore the incentives of information intermediaries to divert consumer search, through which intermediaries benefit the most.[22] The underlying drive for search diversion is market inefficiency where, on the one hand, consumers fail to internalize externalities generated from their search activities, and on the other hand, stores fail to internalize the externalities related to the impact of total consumer traffic to intermediaries. Thus, intermediaries use search diversion to (1) strike balance between higher total consumer traffic and more searches (i.e., revenues) per consumer visit; and to (2) influence stores' strategic decisions (e.g., pricing). These conclusions are consistent with the pervasive observations in the marketplace, both online and offline.

3.2.2 Product Differentiation

As noted in Loginova (2009), "goods sold over the Internet are clearly not perfect substitutes for otherwise identical goods sold by brick-and-mortar retailers" for two reason. First, online purchase is associated with varying wait times. Second, reputation becomes important especially for products with nondigital attributes (Lal and Sarvary 1999; Deregatu, Rangaswamy and Wu, 2000; Dinlersoz and Pereira 2007) because buying online renders physical inspection prior to purchase impossible, which in turn leads to increased brand loyalty as consumers self-select into familiar products and brands. For certain auctions, for example, the online platform remains a second choice from the seller's perspective (Kazumori and McMillan 2005).

Iyer and Pazgal (2003) show that e-retailers who use shopbots not only compete on prices but also on other dimensions such as reputation, reliability, and the quality of service. The use of shopbots acts as a means for product differentiation. They show, both theoretically and empirically, that consumers who use shopbots enjoy much lower prices than those who do not.

[22] Hagiu and Jullien (2011) offer several examples of search diversion in footnote 1 on p. 137.

Product differentiation can also be achieved through the type of e-retailers. In stylized models, several authors have justified the observations documented in the empirical literature on price dispersion between different types of e-retailers (Aiura 2007; Yan 2008; Lu et al., 2009; Loginova 2009).

3.2.3 Dynamic Pricing

Several studies propose dynamic pricing models in various settings. Jiang et al. (2011) investigate the updating bundle prices of recommended items, as consumers sequentially add items to the shopping cart (e.g., Amazon.com). Such a practice is infeasible in the traditional market where retailers are only able to offer fixed bundles. In practice, one needs both market survey data and tracked online information to execute this pricing model.

Some Websites (e.g., Priceline.com) sell opaque products "where a retailer withholds key information about product characteristics and forces consumers to make purchase decisions blindly." Zouaoui and Rao (2009) show that dynamic pricing can be profitable despite limited targeting capacities because it targets price-sensitive consumers who would otherwise forgo the product altogether. Gal-Or (2011) further evaluates the profitability of these pricing models in the air travel context. Etzion et al. (2006) consider a framework where a monopolist uses both auction and the posted price model and propose optimal auction designs. One application of their model is the "buy-now" option available on many auction sites, including eBay.

3.3 The Experimental Literature

Most empirical studies on Internet pricing are limited to field data, which are sometimes difficult to control for unobserved differences between sellers even in a homogeneous product market. Cason and Mago (2010) comment on the limitation of empirical studies using field data (p. 425):

> But one limitation of the field evidence is that it rarely can include truly homogeneous products as typically assumed in theory. Even when the items being purchased are identical products produced by the same manufacturer, the retail distribution typically features differences in customer service, reputations, and (particularly relevant for Internet retailing) beliefs in delivery reliability. The observed price dispersion in the filed data might therefore reflect some of these unobserved differences between sellers of an identical product.

As an alternative, experimental research offers valuable empirical evidence that overcomes some of the shortcomings in empirical studies. To date, however, this strand of the literature on Internet pricing remains relatively sparse. The design of experiments can sometimes be challenging, and participants may not be entirely rational during such experiments, rendering straightforward evidence to support

economic theories difficult to obtain. These experiments overlap with the field of behavioral economics in which consumer psychology becomes a component.

3.3.1 Laboratory Experiments

To study consumer search, Cason and Mago (2010) test firms' pricing and advertising strategies in the laboratory and find that sellers, on average, charge lower and less dispersed prices and advertise more often than theoretical predictions. In an early study, Cason and Datta (2006) use robots instead of human buyers. A comparison between these two studies indicates the important role of *behavioral* equilibrium in buying decisions. On the one hand, human subjects constantly "update their beliefs and search strategies" as the experiments progress, while robots always stick to programmed rules. On the other hand, human subjects are more likely to be risk-averse, rather than risk-neutral as often assumed in theory (Cason and Mago 2010).

When a product price consists of multiple components, it offers retailers an opportunity to be creative in terms of pricing. Through lab experiments, Chatterjee (2011) shows different perceived values among promotions on reduced shipping charges, reduced base prices, and reduced all-inclusive prices, which depend on the relative size of a surcharge to the base price. He finds that base price promotion is more effective for expensive products with a low shipping charge.

In the marketing literature, studies often use questionnaires to investigate consumers' responses to different pricing strategies. Unni et al. (2010) examine the channel effects and argue that consumers, in general, tend not to use cross-channel price references, particularly among "heavy online users." Therefore, MCRs may not be too concerned about price disparity across distribution channels. For example, the use of "Web only" pricing can easily alleviate any potential channel conflicts. E-retailers, as Unni et al. (2010) recommend, "should base their pricing on channel characteristics" in the search for optimal strategies.

3.3.2 Field Experiments

To tackle the issue of data restrictions, several studies of auctions use a "hybrid" of the laboratory and field research through conducting actual transactions. Reiley (2006) designs two real experiments to test the effects of reservation prices in a preexisting auction environment (i.e., the online market for *Magic* cards). Jin and Kato (2006) use both secondary and field experimental evidence (in two separate periods) to show a non-monotonic relationship between bidding price and seller quality. More recently, Ely and Hossain (2009) find small yet statistically significant benefit gained from late bidding compared to early bidding in their field experiment auctioning DVDs on eBay.

The use of the name-your-own price (NYOP) model (e.g., Priceline.com) has become popular in recent years. Hinz et al. (2011) focus on dynamic pricing in the

context of NYOP markets through both lab experiments and field experiments at an actual NYOP website. They find that adaptive threshold pricing is more profitable than fixed threshold pricing and, interestingly, also leads to higher consumer satisfaction, which can be explained by a higher likelihood of successful offers.

While it is theoretically feasible, obtaining demand information based on personalized prices is often difficult, if not impossible, as firms firmly guard business confidentiality. Conducting a web-based field experiment of selling bundles of personalized digital images on Homework Hero, an online service for K-12 teachers to post assignments, Chappell et al. (2011) find that versioning is profit-enhancing compared to the single-version alternative.[23] Future research could extend the same econometric method to versioned goods in other markets.

4 Online Pricing Strategies in the International Markets

In this section, I present recent studies of online pricing strategies using data collected from outside the U.S., adding to the chapter an international perspective on this issue.

One of the early studies using the data from an international online market is Lee (1998), in which used car auctions in brick-and-mortar and online markets are compared. Through an industry case study, Lee (1998) notes higher online prices despite significant lower search costs and offers three potential explanations. One factor that may explain Lee (1998)'s observation is the choice of differentiated products, in which used cars sold online through AUCNET are of much higher quality than those in traditional markets. Later studies mainly focus on brand-new homogeneous goods to factor in this source of price differences.

I summarize this branch of the empirical literature in Table 7. One strand of this literature applies the same methodology as in the U.S. data to international data (usually within a single country) and offers some insights on indirect comparison between the existing literature and new evidence. For example, on the topic of price and price dispersion, Friberg et al. (2000) study books and CDs sold in Sweden, Danaher et al. (2003) study grocery data in New Zealand, Liu and Tang (2005) study the Chinese book market, and Li et al. (2009) study the Australian DVD market, to name a few. Other studies focus on price dynamics (e.g., Liu and Tang (2005) on books in China; Li et al. (2009) on DVDs in Australia; Mizuno et al. (2010) on electronics in Japan), auctions (e.g., Koppius et al. (2004) on Dutch flower auctions; Englmaier and Schmoller (2011) on football game auctions at HATTRICK, U.K.), and field experiments (e.g., Zhong and Ong (2011) on prepaid phone cards at Taobao.com, China).

The virtual shopping marketplace is borderless, offering an excellent exercise ground for conducting global business. Another strand of this literature takes

[23] In Chappell et al. (2011), one of the authors actually owns the online service.

Table 7 Empirical studies on the international online markets

Article	Data duration	Country	Product category	Prices and price dispersion
Lee (1998)	1991–1995	Japan	Used car auctions	Higher online price
Friberg et al. (2000)	Oct 1999	Sweden	Books, CDs	Higher online
Danaher et al. (2003)	Jan–Dec 1998	New Zealand	Grocery	Higher brand loyalty for online purchases than offline grocery shopping
Koppius et al. (2004)	Jan 1995 – Dec 1997	Dutch	Flowers	Lower online price
Lee et al. (2003)	2000	Korea	CDs	Lower online
Gatti and Kattuman (2003)	Oct 2001–Jun 2002	France, Italy, Netherlands, Spain, Sweden, UK, Denmark	Electronics	Levels of price dispersion vary across categories and countries
Ancarani and Shankar (2004)	Mar–Apr 2002	Italy	Books, CDs	Lower online price; higher online dispersion
Tang et al. (2004)	Dec 2001–Feb 2002	Korea	Books	Dotcoms charge lower prices than MCRs but comparable price dispersion
Liu and Tang (2005)	Jan–Mar 2001	China	Books	e-retailers charge lower but greater price dispersion
Baye et al. (2006)	Oct 2001–Jun 2002	France, Italy, Netherlands, Spain, Sweden, UK, Denmark	Electronics	Price and price dispersion rise within E.U. zone after the Euro introduction
Cabolis et al. (2007)	May 2002	U.K., U.S.	Textbooks	Higher U.S. textbook prices than UK prices
Li et al. (2009)	Jul 2003–Jul 2004	Australia	DVDs	e-retailers charge lower prices and lower price dispersion
Ancarani et al. (2009)	2003	France, Germany	CDs	Higher online price; higher online dispersion
Mizuno et al. (2010)	Nov 2006–Oct 2008	Japan	Consumer electronics	As prices fall, the size and frequency of price adjustments rises
Bachis and Piga (2011)	Jun 2002–Jun 2004	Europe	Airfares	Fares in different currencies cause price dispersion
Englmaier and Schmoller (2011)	Nov–Dec 2007	U.K.	Football game auctions	Higher reserve prices for previously traded players than players that sellers promoted internally
Gaggero and Piga (2011)	Jun 2003–Dec 2004	U.K., Ireland	Airfares	Price dispersion falls with competition

advantage of data availability and conducts direct cross-country comparisons, offering recommendations to online retailers on global pricing strategies. The European Union (E.U.) is a natural choice for cross-country studies given the benefits of a single currency, the Euro, and geographic proximity. In fact, a number of studies attempt to establish connections between the Euro and the observed pricing phenomena in the vast European marketplace. For example, Baye et al. (2006a) investigate the effects of the introduction of the Euro on electronics prices in seven European countries. In the airline market, Bachis and Piga (2011) find evidence of differences in currencies serving as a source of price discrimination. In the music CD market, Ancarani et al. (2009) attribute the cross-country differences between France and Germany to disparities in market structures and relative consumer attitudes towards the Internet, despite the gradual convergence in the E.U. region. Cabolis et al. (2007) is another study on price discrimination related to different cultures between countries. Taken together, these studies nicely complement the existing literature in which most efforts have documented inter-firm equilibrium price dispersion (see Baye et al. 2004a).

To provide a clear overview of this particular literature, I summarize in Table 7 selected studies on the international online markets, including data duration, country of study, product categories and main findings.

5 Future Research Directions

In this section, I discuss emerging trends in this fast-changing marketplace and suggest future research directions.

First, empirical research on Internet pricing needs to challenge the new frontiers. One issue is that most studies comparing online and offline prices often use data collected early in the e-commerce era, usually prior to 2005 (see Tables 4 through 7). As much has changed during the last decade, it would be interesting to re-investigate the topic using most recent data. Some attempts have been made for such inquiries (see, for example, Gan et al. (2007) using 2004–2005 data, Chiou and Pate (2010) using 2005–2006 data, and Englmaier and Schmoller (2011) using 2007 data), but there is still room for new evidence.

Another related data suggestion is to gather transaction data (both price and sales information), as opposed to posted prices. Researchers sometimes use the rank of sales as a proxy, or they even use actual purchases to obtain quantity information (Chevalier and Goolsbee 2003; Baye et al. 2004a). Hong and Shum (2006) propose a novel method of using only price data to estimate consumer search costs. With additional individual-level data, future studies can use richer models of supply and demand to disentangle the sources of observed price dispersion on the Internet, namely market inefficiency versus product differentiation (Hortacsu and Syverson 2004).

Compared to the vast literature on price and price dispersion, online pricing dynamics is currently understudied. A few studies have initiated the research in

this direction (Liu and Tang 2005; Sengupta and Wiggins, 2007; Li et al. 2009; Mizuno et al. 2010) through comparing price adjustments between online and offline retailers and/or between Dotcoms and MCRs. Additional work in this area would provide us with a more complete picture of online pricing strategies.

Second, the use of online social network media has gained substantial popularity recently. Another possibility is to test how e-retailers respond to the effect of "word of mouth" on websites such as Facebook, Google plus, and Twitter.

The rise of Groupon is also fascinating to investigate, given data availability. This shift of power towards consumers has definitely opened a new line of inquiry.

On the methodology front, structural estimation in this area is also lacking, with a few exceptions. Baye et al. (2011) introduce a novel structural estimation technique to measure the effects of horizontal mergers on prices. However, there are a number of weaknesses in this study, largely due to data limitations, as mentioned in Baye et al. (2011), which opens the door for future research in this direction.

In the experimental literature, disparities between studies using robots and human subjects suggest the need for additional research to better explain the potential limitations of Nash equilibriums in the presence of imperfect information (Cason and Mago 2010). As Ellison and Ellison (2005) note, running field experiments in settings other than auctions may be interesting: "For example, one could set up and operate a number of 'competing' websites selling similar products… Such experimentation could be powerful tool for estimating characteristics of demand and testing models of consumer decision making."

Finally, there have been growing cross-border collaborations in e-commerce, which open opportunities for future research in that direction. For example, eBay owns 93 % of GittiGidiyor.com, Turkey's leading online marketplace. Incidentally, Amazon recently purchased a share of a leading Turkish online retailer, Ciceksepeti.com, which specializes in gifts such as flowers. Of course, product selection should be carefully considered given several cross-border differences such as currency and demand elasticity. Current studies mostly focus on E.U. countries. With similar proximity features, Eastern Asia or Latin American regions, for example, are also ideal setting for such studies. One could carry out similar investigations on pricing tactics, say by airlines, given the increasing cross-border travels among China, Japan, and Korea, for instance.

6 Conclusion

This chapter reviews the existing literature on online pricing strategies. While the general trend indicates declining price dispersion in e-retailing (see Table 6), the extent to which prices vary depends on the type of product(s) a market carries, mainly because market friction and product differentiation jointly affect each product market differently. As the market evolves, the relative importance of

product differentiation may overweigh that of market friction as e-retailing becomes increasingly transparent, owing to advancing technology.

As concluding remarks, I discuss some practical recommendations about online pricing strategies.

First, e-retailers need to constantly re-evaluate their practices to keep up with the rising popularity in social networking and new Internet browsing devices (e.g., mobile phones and tablet computers). On one hand, the focus of competition may shift from prices to non-price attributes. On the other hand, e-retailers should take advantage of these new venues for targeted advertising, such as distributing coupons via Facebook and Twitter.

Second, e-retailers should carefully incorporate into pricing strategies political, social, and economical differences when entering international markets. Instead of universal pricing, the optimal price should always be localized, sometimes subject to specific regulations. E-retailers should also allow multiple payment options especially where electronic payments are underdeveloped. For example, the collect-on-delivery model was the key to success among Indian e-retailers.

Finally, the border between online and offline channels becomes increasingly blurry, giving rise to hybrid operations in retailing. While MCRs aggressively expand the territories of online sales through in-store Web-enabled kiosks, and free pick-ups and returns for online orders, traditional Dotcoms need to explore the possibility of opening physical stores to complement the online channel. These strategies can also serve as effective means to price discriminate consumers who value the convenience that are brought about through such hybrid business model. As the prospect of a legislation requiring all e-retailers to collect sales tax looms near, this hybrid business model is a practical way to embrace a new era.

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An Integrated Review of the Efficacy of Internet Advertising: Concrete Approaches to the Banner Ad Format and the Context of Social Networks

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Abstract Advertising investment on the Internet is currently growing at a faster rate than in all other means of communication. Specifically, companies' integrated marketing communications (IMC) are using the Internet as a main means of advertising and, increasingly, social networks as part of their communication strategies. Given their growing importance, this chapter performs an exhaustive theoretical analysis of the efficacy of online advertising. First, we perform a detailed inventory of the main forms of advertising used on the Web and social networking sites. Afterward, we analyze the variables shown, through literature, to be most influential on online advertising effectiveness, paying special attention to the banner ad format. Next, the topic of advertising effectiveness in the specific context of social network sites is discussed. In conclusion, some relevant implications for practitioners and research opportunities are presented.

Keywords Advertising effectiveness · Internet advertising · Online advertising · Advertising formats · Banner ads · Social network sites

1 Introduction

In this day and age large sums of money are dedicated to commercial communication on a global level. This budget tends to be divided into conventional media and nonconventional media. Very recently, nonconventional media used in communication have assumed large importance as far as their share of business

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budgets are concerned. Among the most-used advertising media during the last few decades, the Internet is especially noteworthy. The analysis done by advertisers and marketers of the behavior and time dedicated by Internet users shines a light on the level of the Internet's pervasiveness, as well as the number of hours, which are continually increasing, that are dedicated to surfing the web, to the detriment of time dedicated to other means of communication. The main contribution of this paper is to offer a description of the theoretical framework of the subject of online advertising effectiveness, looking at the various formats, although special emphasis is given to the banner ad format.

Additionally, special attention is paid to the specific case of social network sites (SNSs), examining the main aspects of advertising effectiveness in this setting that have been studied in academic literature. We ought to be conscious of the fact that, in terms of the time spent by individuals connected to the Internet, SNSs are the online platforms to which they dedicate the most time (Hughes et al. 2012; Raacke and Bonds-Raacke 2008). Therefore, SNSs have become important places of high strategic value for placing advertisements. One analysis of time dedicated to the main social networks (Facebook, LinkedIn, etc.) shows elevated numbers of active-user traffic. When faced with this situation, the SNSs must consider how to monetize their mass of users (e.g., Facebook has over one billion users already), as the main revenue source of SNSs is the sale of their advertising space for publicity (Lipsman et al. 2012). This tendency is related to the exponential increase of online advertising investment that has occurred in recent years (Nielsen 2012).

Companies are aware of the importance of running campaigns on SNSs that prove relevant for the users. To this end, advertisers must concentrate on improving advertising efficacy. With this backdrop, in this review specific questions are posed in relation to this topic, such as: what is understood about advertising efficacy on SNSs? Is advertising on SNSs more effective than advertising in conventional media? What are the perceptions, beliefs and attitudes of the consumer towards SNS advertisements? Are they more favorable than in other advertising-saturated media? etc. Nevertheless, analysis of the literature indicates that many questions about advertising on SNSs remain unanswered. The popularity of social networks and their recognition as a potential medium of advertising have grown so quickly that research studies have not been able to keep up with the pace of the industry. With this work, we are also endeavoring to offer an integrated revision of the topic of advertising on SNSs.

The remainder of the article is as follows. First, a starting approach to the online advertising framework is made, introducing the entire spectrum of advertising formats used on the Internet, with specific descriptions of formats used by outstanding SNSs such as Facebook, among others. In Sect. 3, the main influencing factors of online advertising are introduced; a detailed analysis of the specific case of the banner ad format is performed due to its special relevancy. Next, the topic of advertising effectiveness in the specific context of SNSs is addressed. Finally, some theoretical and practical concluding remarks about online advertising effectiveness are discussed and interesting future lines of research are pointed out as well.

2 Literature Review on On-line Advertising

In order to establish a starting point for the study of efficacy of advertising Internet, and more specifically, on SNSs, an analysis of the main articles of advertising research has been performed. As a starting point, we examine the bibliometric study of advertising research on the Internet by Kim and McMillan (2008), as well as the revision done by Ha and McCann (2008). Then we expand said analysis, incorporating the new proposals that have emerged on the topic of studies of advertising messages published on the Internet. We pay special attention to the analysis of the research focused on the topic of advertising on SNSs.

As done by McMillan, we analyze the main works related to the study of Internet advertising. To this end, a selection of specialized journals has been chosen, highlighting four main magazines in the academic sphere related to advertising, marketing and the Internet. Said magazines are classified based on number of citations and impact factor, according to the Journal of Citations Report (JCR), from which *Journal of Advertising, Journal of Advertising Research, Journal of Current Issues and Advertising Research* and *Journal of Interactive Advertising* were selected. The authors, by means of a statistical analysis of the citations that appear throughout these publications, discovered that the main topics dealing with advertising on the internet can be broken down into six themes: (1) effectiveness of Internet advertising, (2) interactivity, (3) electronic commerce, (4) advertising processes, (5) attitude towards the site/ad/brand, and (6) comparisons to traditional media.

With the objective of updating the analysis performed by Kim and McMillan (2008), we do a revision of main contributions published on the subject of advertising research. We select, firstly, the most cited magazines in the area of marketing and advertising according to JCR (2011 edition), ranked by impact factor on its JCR's subject. After the revision, articles were selected whose keywords included the terms *advertising*, *Internet* and *social networks*. Going forward from these works, a detailed classification of the apparent themes was elaborated and organized by year. The most relevant works are classified by themes based on their key words and content, which most notably include: advertising effectiveness, consumer behavior studies, effectiveness studies for different online advertising formats, Internet and SNS, and electronic Word of Mouth (eWOM). The analysis period spanned from 2003 to 2012.

As Tables 1 and 2 show, the main trends and topics related to internet-based advertising are:

- The growth of social communication platforms on the Internet. Here, the analysis of eWOM (electronic Word of Mouth) on the Web is especially interesting (see the authors' chapter on e-WOM in this handbook). A number of important studies evaluate eWOM produced in social networks (Amblee and Bui 2011; Chen et al. 2011; Chu and Kim 2011; Lee and Youn 2009; Okazaki 2009; Prendergast et al. 2010; Riegner 2007; Smith et al. 2007). Special attention is paid to UGC (User-Generated Content) related to brand equity

Table 1 Papers on internet advertising by themes for the time period 2003 to 2011

Research topics related with advertising effectiveness	*Source (by chronological order)*
Sponsorship and patronage on the internet	Rodgers (2003)
Analysis of synergies between media (TV and Web)	Chang and Thorson (2004)
Advertising evasion on the internet	Cho and Cheon (2004)
Virtual direct experience (VDE) with the advertised product	Griffith and Chen (2004)
Analysis of exposure frequency and experimentation between media	Havlena et al. (2007)
Banner design and its influence on Click through rate (CTR)	Robinson et al. (2007)
Strategies for banner repetition and its relation with brand memorability	Yaveroglu and Donthu (2008)
Inefficacy of the banner's CTR	Fulgoni and Mörn (2009)
Internet campaigns: creativity, placement and budgetary strategies	Li et al. (2009)
Social media metrics	Murdough (2009)
Analysis of brand exhibition between media	Romaniuk (2009)
Combined efficacy between print media and the Internet	Wakolbinger et al. (2009)
Banner formats and positions within websites	Goodrich (2010)
Evaluation of the methods employed to measure advertising efficacy	Lavrakas et al. (2010)
Efficiency between media (advertising of the automobile market in Spain)	Pergelova et al. (2010)
Combined analysis of distinct advertising media's (importance of social networks) ability to increase brand value	Pfeiffer and Zinnbauer (2010)
Advertising in videogames. The relationship between the advertised product or service and the videogame's theme (congruency, integration and prominence)	Chang et al. (2010)
Evaluation of negative attitudes towards distracting advertisements	Duff and Faber (2011)
Prescription of and involvement with online videos (Youtube)	Hye-Jin et al. (2011)
Mitigating the effect of videogame advertising on children	Soontae and Stern (2011)
Evaluation of advertisement generated by the consumers (analysis, criticisms, etc.)	Steyn et al. (2011)
Research topics related with consumer's attitudes and behaviors (antecedents and moderators)	*Source (by chronological order)*
Exposure level on response CTR banner	Chandon et al. (2003)
Study of memory and recognition of online advertising	Danaher and Mullarkey (2003)
Study of offensive advertising in Asia	Prendergast and Chia (2003)
Effect of advertising banners: congruency with the context and color on attention and attitude	Moore et al. (2005)
Study of the home page's complexity on attention, attitudes and purchasing intention	Geissler et al. (2006)
Attitude towards advertising via SMS	Carroll et al. (2007)

(continued)

Table 1 (continued)

Analysis of visual strategies of global brand in local markets	An (2007)
Study of the relationship between the advertisement and the measurable behavior of interest to the brand	Graham and Havlena (2007)
Integrated model for advertising clutter offline and online	Ha and McCann (2008)
E-WOM (word of mouth setting on the web)	Youn and Kim (2008)
Study of trust as an attitude moderator	Bergkvist (2009)
Attitudes towards four other types of interactive advertisements (based in the Internet, email, cell phones and SMS/MMS)	Cheng et al. (2009)
E-WOM (word of mouth setting on the web)	Lee and Youn (2009)
Tactical use of mobile marketing. WOM vs. E-WOM	Okazaki (2009)
Acceptance of advertisement in social networks (on-line)	Fue Zeng et al. (2009)
Investigating online advertising through Chinese and American culture (OTOA)	Sun and Wang (2010)
Effects of self-endorsing versus other-endorsing in online advertisements on consumer's brand attitude and purchase intention	Ahn and Bailenson (2011)
Interpersonal trust and credibility on social networks	Hung Li et al. (2011)
The effect of impersonal or personal channels on the consumer's intention to adopt the Internet at home	Wei et al. (2011)

(Christodoulides et al. 2012) and the earned media (Nelson-Field et al. 2012) on SNSs.

- The ease with which messages are propagated in the network and their bond with buzz marketing and viral marketing. Specifically, it is proposed that the propagation of messages is related to users' need to construct and express their identity (Taylor 2012).
- The existence of a large line of studies focused on the different advertising formats employed on the Internet. From amongst these works, the most-studied format is the banner. The evaluation of measures of behavioral efficacy through CTR (click-through rate) stand out as noteworthy (Fourquet-Courbet et al. 2007; Moore et al. 2005; Robinson et al. 2007; Yaveroglu and Donthu 2008). Studies of the factors that affect the click-through keyword search ads are also important (Yun 2012).
- Among the global SNSs, Facebook is the most dominant—and fastest growing—social medium, with more than 1 billion active users as of October 2012, of which over 600 million are active monthly mobile users. For marketers, Facebook's platform offers a different kind of mechanism for communicating with their potential audiences, which gives it a very important role in companies' IMC policies (LaPointe 2012; Lipsman et al. 2012; Nelson-Field et al. 2012).
- The study of advertising efficacy through web-user behavior. Here, the focus of interest is on negative beliefs, attitudes and behaviors that might arise when receiving and processing online advertising (Cho and Cheon 2004; Taylor et al. 2011).

Table 2 Publications about online advertising response models

Classification	Summary	Author (Year)
Models for the evaluation and selection of advertising media	Evaluation of media through a network of information	Coulter and Sarkis (2005)
	Analysis of the benefits of conventional media compared to new media advertising	Pfeiffer and Zinnbauer (2010)
	Updating the ARF model for the selection of advertising media by advertising/media agencies	Romaniuk and Gugel (2010)
Models of efficacy in relation to disposition towards advertising	Effect of creativity on advertising efficacy	Cramphorn and Meyer (2009)
	Focus on the the ad's assertiveness. Study through distinct cultures	Terlutter et al. (2010)
	Influence of the editorial likeability and the editorial effect on later evaluations of the ads	Chang (2011)
Internet and on-line formats	Focus on advertising evasion on the Internet	Cho and Cheon (2004)
	Analysis of the pages' hyperlinks ability to enhance the efficacy of an ad	Sohn and Jee (2005)
	Focus on the intention to purchase and repurchase when a banner is viewed	Manchanda et al. (2006)
	E-mail viral marketing as a form of electronic word-of-mouth (eWOM). Determinants of opening-forwarding e-mail messages	San José-Cabezudo and Camarero-Izquierdo (2012)
	The factors affecting click-through keyword search ads	Yoo (2012)
Online social environment	Influence of the users of a social network (analysis and modeled with time series data)	Trusov et al. (2010)
	Evaluation of WOM and observational learning in online social interaction	Chen et al. (2011)
	The diffusion process in a social network given the individual connections between members	Katona (Katona 2011)
	Acceptance of advertising on social networks	Taylor and Lewin (2011)
	How brands reach and influence fans through social-media marketing	Lipsman et al. (2012)
	Measuring Facebook's Impact on Marketing through the value of a fan	LaPointe (2012)
	Social Web. Understanding user-generated content (USG) creators, and how their engagement with brand-related UGC affects their brand perceptions and hence their communications about that brand	Christodoulides et al. (2012)

- The study of the emotions caused by advertisements allows a more accurate prediction of its efficacy than evaluative measures of information processing such as persuasion, brand linkage, cut-through measures, and even message delivery (Wood 2012).
- Of the actions that improve the efficacy of messages on the network, correctly predicting the criteria of segmentation to select our target objective proves crucial to increasing purchasing intent or product use in social networks (Tucker 2011; Yeo 2012).

Next, a description of the high-relevancy advertising formats on the Internet and SNSs is offered.

2.1 Advertising Formats on the Internet

In the beginning, Internet advertising employed simple formats that achieved a very strong response from users (Rae and Brennan 1998). As bandwidth connections have increased, the possibilities to create online ads have grown exponentially, since greater bandwidth allows the user to download a greater amount of information (Internet World Stats 2011). Furthermore, the technological development of programming languages and software has paved the way for a wide variety of Internet advertising formats. This has led to current campaigns being composed of audiovisual and multimedia material. Therefore, advertisers are faced with the decision of which format best fits their creative content and advertising strategy needs.

In this day and age one can find millions of websites that feature new advertising formats with integrated multimedia elements such as on-demand audio or video streaming; these formats called *rich media* by the IAB (2011 p. 16). In Table 3, the principal advertising formats on the Internet can be observed, classified into the categories: integrated formats, floating formats and transitional formats.

Among the *integrated formats*, the most important is undoubtedly the banner, which with more than eighteen years of use, continues to be one of the most commonly used advertising formats on the Internet. The first known banner on the Internet appeared on the site HotWired.com in 1994 (Cho and Leckenby 2003). Since then, it has become the most frequently used advertising format on the Internet and has also consistently sustained the interest of researchers. The banner is essentially a piece of advertising within a website, similar to what it has historically been in print media; i.e. with the support a website instead of a print newspaper, magazine or similar medium. Its primary objective is to attract traffic to the page of the advertiser, who pays for the ad's inclusion on certain pages. Generally the banner ads are created with images (formats: GIF, JPEG or PNG) or with animation developed through technologies such as Java Adobe Shockwave and, most commonly, Flash. They are designed with the intention to grab attention,

Table 3 The most used advertising formats on the Internet

Advertising formats	Types
Integrated formats	• Sponsored links
	• Ad sense
	• Banner
	• Expandable banner
	• Leader board
	• Medium banner
	• Mega banner
	• Skyscrapers
	• Buttons
	• Full page-ads
	• Sponsored sections
Floating formats	• Pop-up
	• Pop-under
	• Layers
Transitional formats	• Interstitials
	• Superstitials
	• Preloaders
Mobile marketing	• Mobile Marketing
Advergaming	• Product or brand placement
Email Marketing–Direct Marketing	
Rich media	• In-Banner Video file-loaded
	• In-banner video streaming
Electronic bulletins	
Mini-sites	
Viral marketing	
Sponsorship	

be flashy and communicate the desired message. Therefore, banners do not necessarily need to conform to the graphics of their containing website. This explains the designers' effort to create more and more attractive banners by combining different designs with high quality images, in 3D and with movement.

Among the *floating formats*, the most studied are *pop-ups* and *pop-unders*. Pop-unders, in comparison with pop-ups, are less interruptive since they appear behind the main page that is being visited. But, for this same reason, they are not seen until the user closes they windows that they are using, making it more difficult for the navigator to determine which page activated the opening of the pop-under (Moe 2006). Sometimes emerging formats of pop-ups activate new windows, occasionally creating an infinite loop, which, intentional or no, is normally very upsetting (Edwards et al. 2002; Quinones et al. 2008). Due to this, techniques and programs that block the appearance of this type of emerging windows continually appear under the common names *pop-up killers* or *pop-up blockers*. In 2004, some of the most important websites (e.g., msn.com) began to limit the use of emerging windows, considering them overly intrusive for users.

Some of the other commonly used formats on the Internet fall into the category of *transitional formats*, in which the formats known as *interstitials* and *superstitials* are found. This type of ads bears great resemblance to television ads. The fundamental difference is that interstitials appear between two pages of content. They are therefore referred to as transitional advertisements; in other words, the user sees the ad while they navigate between page "a" and page "b." Superstitials correspond to an interactive advertising format similar to a television spot, developed for sending a message from a single sender to a single receiver. Next, the formats employed by the main SNSs are highlighted due to the businesses' increasing investment in these new media.

2.2 Advertising Formats on SNSs

SNSs provide advertisers with a large amount of information from their millions of users (Hughes et al. 2012). When the quantity of users and the time dedicated to participation is high, SNS spaces begin to be attractive to companies, as they are able to use them to introduce their products or services through advertisement.

Text, video, audio and other multimedia-based content on the web (rich media) can be included in SNSs' structure. The aim of businesses is to increase the number of followers a brand has, promote a network, share a promotion, generate notoriety, introduce a new product, etc. This makes SNSs especially interesting to advertisers, since they are in possession of larger space and greater flexibility than conventional advertising media, expressed in terms of interactivity, personalization and feedback (Benevenuto et al. 2009). In traditional channels, users maintain a reactive attitude, meaning they are passive and open to suggestions; this includes advertising. In contrast, in social media users participate with a proactive attitude, providing content, photographs, opinions, and proposals. Because of these unique characteristics of social media and its users, conventional advertising actions normally obtain inferior results when compared to those that are launched on SNSs. Advertising becomes a fundamental axis on which the main SNSs base their strategies for monetizing their activity; they possess space, audience and information about their users, through which communication campaigns can articulate effectively and, most importantly, efficiently.

In Table 4, one can observe some of the advertising formats employed by Facebook and Twitter, two of the main social networks on the global level, as well as Tuenti, an especially popular social network in Spain. Each of them will be commented on in detail.

Facebook, considered to be the world's main social network (Darvell et al. 2011; Lipsman et al. 2012), presents the following advertising formats as part of its fundraising strategy: sponsored pages, sponsored ads, sponsored stories and the use of complementary material that can be incorporated into any web page and that can bring content and social features to any network. Amongst these, we find examples of "Premium" advertising such as: like ad, poll ad, event ad and

Table 4 Social network sites ad formats

Social network site			
Facebook	*Twitter*	*Tuenti*	
Like ad	Promoted-tweets	Pages	
Poll ad	Promoted trends	Sponsorship event	
Event ad	Promoted accounts	Apps	
Comment ad		Social	Loading page + reminder = Welcome page
			Home ad unit
			Photo ad unit
		Business-to-Business	
		Mobile	Display
			Text link
		Video	Auto-play
			Click2play
			Pre-roll
			Auto-play
		Exclusive	Sponsorship
			Games
			Login page
			Racing team

comment ad. The advertising formats used by Facebook are fundamentally based in the use of promoted links with text and images, which can be located anywhere on the pages seen by the user, even the profile page. Advertisers are able to promote their own network and obtain registers/records of users through a *landing page*. Furthermore, these advertising formats allow detailed segmentation by sex, age, geographic location, job type, company, even by the users' behavior in the social network.

Twitter, the number-one microblogging social network in the world, has also developed unique advertising formats. It makes use of promoted tweets, which are comprised of advertising messages in the format of "tweets" (short messages of 140 or fewer characters) that appear in the search results for certain key words. These messages are labeled "promoted" to indicate that they are advertisements, although the properties of a classic "tweet" such as the ability to retweet (i.e., a message that is duplicated or mentioned by another user) are preserved. Another of the unique formats employed by Twitter is known as "promoted trends," promoted topics that subscribers use to spread information of interest, daily, weekly or monthly. In this case, what is spread as a trend would be an advertising message pre-established by Twitter as a trend; when users search for current trends, they find the promoted trend displayed among the search results. However, Twitter does not accept all types of content to be promoted; they solely permit those tweets that, at the time, are already enjoying certain popularity on the network. The most recent advertising innovation that has been incorporated into the network is known as *promoted account* and consists of recommending an account or profile in the "who to follow" section. These accounts must have a relationship with someone

whom the user already follows. In this way, the odds that a user of a social network will follow a promoted account are increased. This allows advertisers to become familiar with the information shared on the social network that, from a communications standpoint, could prove interesting/useful. For example, a business like Coca-Cola would have a vested interest in its profile being visible in the zones of social networks that are dedicated to suggesting who to follow.

The most important Spanish social network, Tuenti, is noteworthy for making a special effort towards employing intense and extensive advertising, but always based on the likes and behaviors of the consumer. To achieve this, Tuenti uses a series of formats, based in hyper segmentation (i.e., who, how, when and where the advertising message is being received), with good coverage of the age segment of interest to the advertisers (18–35 year) (Tuenti 2012). Permanent brand or product pages serve as a meeting point for brands and users with intentions of maintaining a long-term relationship with each other. The pages, in turn, can contain advertising formats. Applications (apps), are the result of integrating a premium brand or product page into an application or small web program through an iframe; they prove to be especially convenient to use on the screens of mobile terminals, since they display such a small amount of the information contained in the premium pages. Sponsored events, which are designed to facilitate the execution of seasonal campaigns, include social features, photos, videos, surveys, comments, etc. Their basic function is to generate traffic and publicity for an event with an end-date determined by the user.

Within the portfolio of advertising formats used by the social network Tuenti, one can find formats with a social character, which are the result of communications with the users, as well as other permanent and temporary formats. The main social formats employed by Tuenti are the *loading page* (initial loading page) and a reminder format. The loading page tends to correspond to a format found in the login during the first 5 s of loading a page and can personalize the message for each user. Next, a reminder tends to appear that redirects the user to a specific event when the loading page disappears (after 5 s); this allows access to the microsite of the associated event or to the advertiser's website.

Additionally, there are formats classified by Tuenti as B2B (business to business), where the *home ad units* are. It is a space located on the profile or homepage of every user that usually includes information about sponsored events, pages and videos. Its defining characteristic is how it adapts to distinct navigation settings. In other words, it can reposition itself in order to display all of its important advertising information to the user. It is usually composed of a logo of a specific size with a title, plus an attached descriptive text. The advertisement located in the home ad units rotates like a carousel, depending on the user's segmentation characteristics.

In turn, there is a photo ad unit, similar to the previous but exclusively found when the user is looking at photographs. This normally includes a floating format in the right margin that follows the scroll of the browser. Both formats—i.e., home ad unit and photo ad unit—serve as a conventional-pricing model based on cost-per-thousand (CPM) and both are composed of a title, description, avatar and URL

that redirects the internet-user to the advertiser's page. Within the same category of B2B, Tuenti incorporates what is known as coupons. The coupons are housed in sections of the sites specifically dedicated to suggesting places such as bars, pubs or restaurants. The process consists of sending the local business's offer by text message to the telephone of the user for free, from which the user downloads a single coupon.

Tuenti has also developed another category of advertising formats, fundamentally based on access via mobile devices, predominantly smartphones. Its goal is to take advantage of the increasing rate of users accessing social networks through mobile devices. This knowledge about the users' behavior has prompted Tuenti to search for an opening for advertisements specifically designed for mobile access. To find advertising solutions, we can turn to the mobile version of Tuenti (http://m.tuenti.com), where users can access a version that features adjusted size and content but that retains the majority of its social functions. The mobile version of Tuenti uses standard advertising formats segmented by mobile terminal, gender, operator and page within the website. Said mobile version is especially optimized for the main mobile terminals on the market. In this version that is accessible by mobile devices, the fundamental method of commercialization is ad display-types such as banners, respecting MMA's (Mobile Marketing Association) standards of presentation: a four-second animated GIF image.

There are also links embedded in the text, causing the advertiser's page to obtain follows through users clicking on these links. These links remain fixed on the home page of the user until the they interact with them (Tuenti, calculates that with this form they can reach up to one million users in 10 days).

Another of the large ad categories employed by Tuenti is advertisement in video form. We have previously commented on the weight that this type of video-based format has in networks (Benevenuto et al. 2009). Those responsible for Tuenti indicates that the use of video has emerged to meet the advertisers' audiovisual communication needs, adding the advantages of video to the characteristics of a social network (advanced segmentation, novel formats, answer to the saturated television market, etc.). Tuenti highlights three video formats:

- *Auto-play* consists of showing the user a spot during the first 10 s of starting a new session, making Tuenti into the host of video-associated content. Moreover, this allows for the possibility of advanced segmentation, advanced control of what is being looked at and the possibility to click on external links.
- *Click2play* consists of a video, which the user can choose to enter or close, appearing when the user begins browsing.
- *Pre-roll* tends to be a video format usually associated with content of professional origin (it could be also a game) where the user initiates its visualization, after viewing an advertisement.

Tuenti also uses another types of exclusive formats with the goal of offering advertisers a brand-generating solution inside of the social network. The main formats used are:

- *Sponsorship*, an exclusive product of social character that introduces a brand's logo at the bottom of the social network's landing page. When the mouse is placed over the logo of the brand that sponsors Tuenti, a rollover format message appears with the advertiser's message and a hyperlink to the company's Tuenti page (their page within the Tuenti network).
- *Games*, a feature that represents a wide set of advertising solutions focused on mini games within the social network. We can distinguish between the development of an exclusive game for a brand or product, the use of sponsorship by a brand or product, personalization of the game and even the placement of the brand in the game or its surroundings (in-game advertisement).
- The use of a *login page* or exclusive access page, a technique that consists of providing the advertiser with the possibility of personalizing the homepage of all of Tuenti's users. This is a format destined to be hugely important for advertisers on certain extremely social occasions (Christmas campaigns, father's day, Valentine's day, etc.).
- Finally, among its array of advertising products, Tuenti uses what is known as *Racing Team*, based on a line of products associated with the team that sponsors the motorcycling world championships.

Next, we delve deeper into the efficacy of online advertising, emphasizing the case of banner format due to its being the most commonly employed advertisement strategy on the Web.

3 Influencing Factors in the Effectiveness of Online Advertising: The Case of Banner Ad

3.1 Overall View

The study of advertising effectiveness is based on the investors/advertisers' need to know if their marketing campaigns successfully contribute to reaching their proposed commercial goals. Authors such as Wells (1997) consider advertising efficacy to be tied to the tangible and quantifiable effects on brands or businesses, ensuring positive returns on advertising investment.

Numerous variables over which advertisers have little control influence the measurement of online advertising efficacy, such as: interactivity (Voorveld 2011), medium saturation (Ha and McCann 2008), experience (Edwards et al. 2002), synergy between media (Chang and Thorson 2004), perceived intrusion of different advertising formats (Li et al. 2002), etc., all of which have the power to alter the evaluation of advertising efficacy. Next, we comment on some of these variables in detail.

Interactivity is considered one of the main differences between advertising on conventional media and advertising on the Internet. It allows reciprocal

communication between users and companies or between users and users (Liu 2001). Interactivity underscores the users' control, alluding to the voluntary and instrumental actions that directly influence their experiences of the advertisement (Liu and Shrum 2002). Liu and Shrum (2002) describe it as a degree through which the users enter into the communication and simultaneously receive their response. Wu (2005; p. 30) defines interactivity as a "psychological state experienced by a site-visitor during the interaction process." According to Wu (2005), interactivity is characterized by: (1) perceived control in relation to browsing, content and place of interaction; (2) perception of the response, i.e. how the web responds to the information entered by the user; and (3) perception of personalization, or the degree to which the consumer perceives the response to be appropriate or personally relevant to the communication. Some studies indicate that the impossibility of being able to send emails from a website and the obligation to register in order to consult some parts of the page negatively affect the perception of interactivity (Voorveld 2011).

Nevertheless, having interactive properties does not guarantee that consumers will perceive the website as more interactive. One of the reasons for this is that what is perceived as favoring interactivity today might not be perceived so tomorrow (Voorveld 2011). Users are used to certain interactivity options on the Internet that they might now take for granted; e.g. hyperlinks in text are part of the function of interactivity but are not as widespread as users currently perceive them to be (Yoo 2008).

Another factor worth highlighting is known as *previous experiences*, a phenomenon that predisposes individuals to react to new situations in the same way that they have acted to previous, similar situations. This parallelism is established in learning based upon consumers' previous experiences (Hoch and Deighton 1989) Hence, it can be expected that those consumers who have been bothered by online advertising in the past (e.g., hindering of reading, slowed browsing, difficulty in understanding searches, etc.), will be conditioned to close the advertisement without having processed it (Edwards et al. 2002).

With respect to *inter-media synergy*, we can say that an advertising campaign is much more effective if it is launched on simultaneously on both television and the Internet than if it is solely spread via television, even if it is broadcast more frequently. With respect to this, Chang and Thorson (2004) indicate that synergy between media such as television and the Internet does a better job of capturing consumers' attention. Thus, the user perceives the advertising message as more trustworthy and will develop a greater number of positive thoughts about the brand, product and the intention to purchase. To obtain these synergies, a total cooperation between those responsible for each message in each media is necessary (Kanso and Nelson 2004).

The *perceived intrusiveness* of an advertising message is created by the user's perception that the ad is intruding into a place where it doesn't belong, which provokes irritation in the user seeing the ad (Edwards et al. 2002; Li et al. 2002). Once the user becomes aware of this, he or she tries to regain control over the ad which is perceived as both intrusive and unauthorized, with more or less intensity

depending on their level of psychological reactance (Brehm and Brehm 1981). According to psychology studies applied to advertising, users try to avoid online advertising in the following scenarios: (1) when the ad impedes them from accomplishing their immediate goals.; (2) when the quantity of ads is considered excessive (saturation); (3) when previous experiences have been negative, which would induce an aversion to online advertising (cho and Cheon 2004); or 4) when the ads interrupt the search process or the completion of a job, causing the user to view the ad negatively (Krugman 1983).

In the upcoming section, due to its importance, we focus on the efficacy of the ad banner format, possibly the most used and studied format.

3.2 Effectiveness of Banner Ads

First, we present the main results achieved in the study of the banner format, whose efficacy and effects have been thoroughly analyzed. In order to introduce the main conclusions drawn about its relevancy as a form of online advertising, it is necessary to differentiate between the criteria used to assess its effectiveness. Next, these criteria are looked at on an individual basis.

The modification of the banner's *physical characteristics* such as changes in color (Moore et al. 2005), size and shape (Cho 2003a; Dos Santos 2007; Hussain et al. 2010; Lohtia et al. 2003), animation level (Burke et al. 2005; Chan, Kim and Stout 2005; Rae and Brennan 1998; Yoo and Kim 2005), and lack of animation (Hong et al. 2007).

Studies that have evaluated the *content of the banner*: type of text (Gong and Maddox 2003; Hervet et al. 2011), incorporated graphic images (Lees and Healy 2005) and different versions of banners' creativity (Blazquez et al. 2008; Brown 2002).

Relationship between the banner and the website: page position (Benway 1998, 1999; Burke et al. 2005; Calisir and Karaali 2008; Ryu et al. 2007), coherence between content and website (Brigham 2011; Cheng and Kao 2011; Kivetz 2005; Kim and Choi 2010; Moore et al. 2005; Zanjani et al. 2011), attitude towards the website, source credibility (Choi and Rifon 2002; Kim and Choi 2010), and the banner's level of exposure (Cho et al. 2001).

Research that evaluates the efficacy of banner ads in relation to the *characteristics of the users* to whom the ad is directed and in which one can manipulate variables such as experience level (brajnik and Gabrielli 2010; Hong et al. 2007), type of browsing done (Danaher and Mullarkey 2003; Hong et al. 2007; Pagendarm and Schaumburg 2001; Yang 2006), familiarity with advertised brand (Cho 2003b; Jessen and Rodway 2010; Sun and Wang 2010), level of involvement with the product (Cauberghe and De Pelsmacker 2008; Cho and Leckenby 2003; Dahlén et al. 2000), task at hand (Voorveld 2011; Hong et al. 2007; Quinones et al. 2008), user's culture (Möller and Eisend 2010), and time exposed to the banner (Danaher and Mullarkey 2003).

In the studies evaluating the advertising efficacy of banner ads, distinct measurement techniques have been used, depending on whether they focused on the consumer's cognitive, affective or behavioral dimensions. In relation to the cognitive dimension, memory (spontaneous or suggested), recognition and awareness are noteworthy. For the affective dimension, variables such as attitude towards the banner, towards the website or towards the advertised products, among others, have been used as tools to measure advertising efficacy (Chatterjee 2008; Li and Bukovac 1999; Moore et al. 2005; Yoo and Kim 2005). Most of the literature has used CTR to measure the efficacy of behavioral dimension. It is understood that the higher the CTR ratio, the greater the efficacy will be in terms of attention generated. This will imply a greater possibility of the message being processed, which, in turn, will have an effect on memories (Cho 1999), attitudes and on the consumers' behavior (Chatterjee 2008). Therefore, each of the modifiable circumstances and characteristics of banners has been evaluated through the cognitive, affective and behavioral dimensions.

One of the first studies conducted by Briggs and Hollis (1997) indicates that banner ads function independently of whether or not the user clicks on the advertisement, if one considers that the click on the ad is a response born of the user's predisposition towards advertising in general and not dependent on the characteristics of the particular advertisement. These authors promote the idea that the efficacy of Internet advertising formats might overtake the efficacy of advertising in other media like television or magazines. Nevertheless, one shouldn't lose sight of the fact that these affirmations were made at a time when the Internet did not possess its current pervasiveness, as the users' experience and advertising saturation were still moderate at that point.

Next, we point out the main findings revealed by the literature on this topic (see also a summary in Appendix).

3.2.1 Physical Characteristics of Banners

Color

Moore et al. (2005) evaluated memory and recognition in relation to the banner's color, font and the background of the website. Colors were analyzed in terms of coherency with the website. Researchers evaluated the level at which the banner's color was suitable for or related to the website where it was located, making two considerations: a banner will be incongruent or incoherent with respect to the website if the colors employed in the creative design are not in accordance with the rest of the website's colors. On the contrary, a banner will be coherent if it respects the colors of the website in which it appears. Specifically, blue versus red tones were tested and showed limited importance on the experiment's design. They concluded that the relationship between a website's background color and the banner color could affect recognition of the website. When the individual perceives a lack of coherence or congruence between the page and the banner, the

attitude towards the website is influenced. Specifically, the perception of incoherence between the banner and website favorably affects the user's memory and recognition, while coherence favorably affects attitudes. These conclusions are reasonable because the incongruence of the banner grabs the attention of the user, increasing the probability of processing the message. Thus, banners can be more or less memorable or recognizable depending on the host website's level of coherency.

In terms of font color, more attention is paid to the advertisements in situations of high contrast between the background and font (e.g., red background with white letters), while advertisements with less contrast (e.g., red background with black letters or blue background with white letters) did not show differences in levels of attention attracted (Moore et al. 2005).

Size and Shape

Baltas (2003) performed an evaluation to see which characteristics an online ad should have to capture users' attention. He found that the bigger the ad size, the better the impression made on the consumer. In this vein, horizontal banners work better than skyscrapers (vertical banners); users prefer banners with short, clear messages over long messages; encrypted promotions and messages have no impact on visitors; and long download times have a negative influence, causing users to change websites and preventing them from seeing both the ad and its containing website. Based on these findings, Baltras (2003) advises advertisers to improve advertising efficacy on the Web and to produce more creative ads that are more useful to potential consumers. Likewise, it is suggested that the banner's shape is much less relevant than its content (Dreze and Hussherr 2003).

The size of the banner could influence how it the banner perceived and, therefore, how effective it is. Dos Santos (2007) evaluated the influence of banner size in relation to episodic memory. It was observed that users show certain cognitive regularity in their processing of different sized banners; there was no statistical evidence to indicate that larger banners are more remembered than smaller banners. The size of the ad does not matter as much as the content (see: Dreze and Hussherr 2003; Lapa 2007).

Animation

Some authors claim that a banner with movement or animation is more effective than a static banner. An animated banner elicits more excitement from the user, which entails a greater level of attention towards the message (Sundar and Kalyanaraman 2004). In turn, more attention will drive click numbers, increasing the chances of have having a better memory of the message (Li and Bukovac 1999).

Nevertheless, the fact that a banner generates a lot of attention does not necessarily imply positive attitudes towards the ad. Diverse studies have demonstrated that an animated banner can cause negative effects on the users. When users believe that the animated banner is irrelevant to the task at hand, they show a tendency to ignore it (Burke et al. 2005). Yoo and Kim (2005) concluded that animated banners provoke negative cognitive and emotional effects in the users. Under certain circumstances, users perceive animated banners as unfair and coercive, which leads to them reacting to regain control as they experience a loss of freedom while the banner is exposed. This situation could cause skepticism and mistrust in the consumer, negatively influencing their attitudes towards the site, and their intentions of revisiting the site. However, there are two variables that can moderate the negative results: loyalty towards the website and the need of knowledge shown by the user (see: Thota et al. 2010).

In the same vein, Kuisma et al. (2010) researched the effects a banner's animation has on attention and memory, using diverse methods including cognitive measurements like eye-tracking as well as recognition tests. The results showed that animation did not have a substantial effect on attention, given that the *skyscraper banner* format increased attention while "conventional" banners decreased it. The most effective condition for drawing attention towards advertising stimuli was the presence of an animated skyscraper and a static banner, although animation did not have a decisive effect on recognition.

In summation, various conclusions about banner animation are drawn. Now we will comment on them in a concise manner. Reducing banner blindness (Bayless 2000), does not produce effects on ad recognition (Bayles 2002), nor does it produce effects on memory (Dreze and Hussherr 2003). Increases in memory and recognition are moderated by involvement (Yoo et al. 2004). Animation speed matters; faster animation increases the attention paid to the format (Sundar and Kalyanaraman 2004). Animation improves attitude towards the ad but worsens attitude towards to the product (Sundar and Kim 2005), delays visual exploration (which reduces memory) (Burke et al. 2004, 2005), increases click behavior, lengthens browsing time, reduces focus, prevents examination of many elements and affects searches (Hong et al. 2007).

With respect to the static banner ad, many determined efforts have emerged in an effort to assess its efficacy. Hong et al. (2007) suggest that the differential, lower effects of ads without animation on users' navigational behavior, compared to ads with animation, could be moderated by several variables. To determine this, they evaluated the type of task being done by the Internet user as well as their experience with the website. They observed that the lack of animation in a banner attracted users' attention, while the existence of animation produced a greater likelihood of click and purchase when the users' browsing process is goal-directed. But with animation, the users' perception of efficiency diminishes, negatively affecting the individual's perception of animation. Therefore, the negative effects of animation are more exaggerated when the user is engaging in exploratory

browsing. Furthermore, they found that the effect of the users' experience with animated banner ads could reduce distraction levels towards their navigational task objective.

Brown (2002) attempted to evaluate superiority regarding the efficacy of the pull-down banner. They concluded that this extra functionality of the banner provided a greater level of interactivity in comparison with a conventional banner, increasing attention, persuasion, pleasure and number of clicks. Repetition of the banner amplifies memory and recognition, increases fluency, and improves affection, cognition and recognition (see Yaveroglu and Donthu 2008).

Web Position

The classic literature affirms that advertisements in the periphery of a website play a different role than those in the main areas. Peripheral advertising is less relevant to the user, which, due to an individual's evasion mechanisms, increases the odds of the message not being processed (Benway 1999). Again, Day et al. (2006) evaluated periphery-type banner ads in the light of multi-attribute decision making (decisions in which the consumer has to choose a brand from a series of options); it was confirmed that banners located in the periphery of a website accelerated the decision making process. These findings suggest banners located in the periphery of a website do not distract users but rather elevate their arousal level, which in turn increases their decision making speed when presented with a multi-attribute choice. This conclusion is supported by Dos Santos (2007), who says that banners located in the lower zone of a website are remembered more easily and to a greater extent than those located in the upper part of the page. Therefore, it seems that the position of a banner prevails as more important than its size.

Page Structure of a Website (Depth of Navigation)

In relation to a banner's containing website, Hsieh and Chen (2011) analyzed the influence of the website's structure on the advertisement, and not only evaluating controllable format variables (e.g., shape, color size and location), as had been done up until this point in the studies evaluating banner efficacy. To accomplish this, the study was based on the premise that attention can fluctuate to the extent that the receiver of the banner moves through distinct, sequential pages of a website. They explored the concepts *attention inertia* and *habituation*. The latter happens when an individual gets used to a stimulus and pays increasingly less attention to it. This phenomenon occurs automatically and does not involve conscious effort. Nevertheless, any aspect of the stimulus that is different or novel (not familiar) can decrease the likelihood of familiarization (Sternberg and Mio 2008, p. 137).

Attention inertia is a phenomenon produced when a person focuses their attention on an object, though the strength of the attention diminishes the longer the object or stimulus remains (Burns and Anderson 1993). These authors

theorized that in a mental process, the inertia of attention is fortified with the passing of time. Thus, an individual can at first be attracted by a "distractor" element. However, when the mental process functions during a sufficient period of time, it grows more and more active and becomes less susceptible to interruptions by distractor elements. The role of "distractor" would be assumed by the advertisement that appears repeatedly on each page, where the receptor is focusing, little by little, their attention towards the main content in step with the passing of time and becoming increasingly resistant to interruption on the part of the advertisement. Based on these premises, Hsieh and Chen (2011) found that users pay more attention to banners located in the first pages they see, regardless of the task at hand. This is especially likely in pages that specialize in images or video. Thus, in a sequential navigating experience, attention towards a banner reduces rapidly as the user delves deeper into distinct pages of the site.

Hsieh and Chen (2011) arrived at the following main conclusions:

- Websites specializing in videos and images present a better exploitation of attention compared to ads in text and ads based in images and text;
- Websites specializing in video are the best at drawing the users' attention towards the ad;
- The main page or landing page of a website is always the best opportunity to draw attention to the ad. However, the first pages based in text or in a text-image combination are worse at attracting attention than later pages based exclusively in images or video;
- Navigating the content of different pages with distinct types of information affects the attention and intensity directed towards the ad. Moreover, the main page is the most sensitive to the effect of advertising content located within it, which distinguishes it from any of the other pages of the website.

3.2.2 Banner Content

Diverse aspects related to the content of banners have been studied. For example, the possibility of an increase in the CTR ratio in the presence of certain graphic elements such as a mouse cursor in the shape of a pointer has been studied. Lees and Healy (2005) concluded that the inclusion of visual elements, like the pointer, do not improve CTR ratios.

With respect to the research analyzing the creativity of banner characteristics in relation to efficacy, Robinson et al. (2007) show that the banner's creativity proves to have greater efficacy in terms of increases in CTR when the creativity is paired with larger banners, with long messages and an absence of promotional incentives.

When it comes to the analysis of the source, credibility can affect the efficacy of advertising on the Web. Choi and Rifon (2002) analyzed the antecedents and consequences of online advertising credibility; they also examined the effects of the website's credibility, the ad's relevance (the relevance of the advertised product in relation to the content of the website), and how the credibility of the

advertiser affected the credibility of the ad, the attitudes towards the brand and the intentions to purchase the product. The results suggest that the source's credibility is vital to understand the efficacy of online advertising, as it can moderate everything mentioned in the previous list. Thus, when the source's credibility is high, the relevance of the ad for the users will be positive, as well as their attitudes towards the brand and towards the intent to purchase.

In another study of effects of the online advertiser's credibility and their corporate reputation on the banners efficacy, Kim and Choi (2010) investigated how coherency and moderation of the advertised product along with the website's content affect the source's credibility. The results show that, while the business' credibility made a significant impact on the consumers' responses, the ad's perceived credibility, the attitude towards the ad, the attitude towards the brand, the intention to purchase and the website's reputation did not command an important influence over the source's credibility. The findings suggest an important moderating role on the part of the coherency between the product and the website, which in turn affects the advertised company's credibility. Thus, when a highly credible business advertises their products in a manner coherent with the website that contains the banner, the ad's persuasion will be more effective; in contrast, companies with low levels of credibility do not benefit from congruency.

Exposure Type (Forced vs. voluntary)

The way in which the receiver is exposed to the message will influence their perception of the message. When the exposure to the information is involuntary, it is automatically and unconsciously set aside to be accessed later at an appropriate time (Cho 1999). On the Internet, thanks to the interactivity of the medium, exposure to advertising messages can occur voluntarily or involuntarily. The banner format begins as involuntary exposure. Nevertheless, when the user clicks on the ad, they are voluntarily exposing themselves to the information contained within. On the basis of this explanation, voluntary exposure will achieve better results and a greater degree of attention will be paid to the message, activating the cognitive learning process more intensely than via involuntary exposure. Internet consumers must perform an extra voluntary action in order to activate cognitive and conscious processing. Therefore, when a user clicks on the banner it is precursor to beginning to actively process the information. As a consequence, better results will be achieved in terms of remembering the information (Cho 1999).

Cho et al. (2001) performed one of the most noteworthy investigations by evaluating differing levels of forced exposure to banner ads. The main results showed that in the case of forced exposure, the user has a higher cognizance of the ad's existence, and, at the same time, the ratio of *click-through* is increased. The most surprising finding is that lots of forced exposure generates a more favorable attitude on the part of the user towards both the ad and the brand, furthermore augmenting the users' intent to purchase. In turn, banners presented in a forced manner lead to positive advertising results, such as a better attitude towards the ad,

towards the brand and towards purchasing intention. One of the explanations that the authors have put forth for this finding (contrary to the original proposal in their hypothesis) resides in the increase of the users' attention in the setting of forced exposure, a deeper attention than in "normal" exposure conditions.

Fang, Singh and Ahluwalia (2007) studied attitudes towards the ad in relation to degree of exposure. They found that among the negative feelings awoken by the level of forced exposure, there were significant feelings of annoyance induced, equally from cognitive evasion as well as from physical evasion, while irritation induced cognitive evasion. They also pointed out that the degree of evasion negatively affects the user's attitude towards the ad.

Search Behaviors

Online navigation seems to usually be directed searching towards a specific goal (Eighmey and McCord 1998). This normally leads to users being focused on their primary objectives, meaning on what prompted them to use the Internet at that given moment (e.g., searching for information, seeing a video, zoning out (janiszewski 1998). Regarding the type of navigation being done by users, Danaher and Mullarkey (2003) created a website experiment through two types of navigation: goal-directed and free. They found that the longer a user is exposed to a certain website, the better their memory and recognition will be of the ads found on said page; those levels of memory and recognition were even higher among users whose navigation was non-purpose-driven.

Calisir and Karaali (2008) performed a study focused on the examination of the factors that influence the recognition of a banner. To do this, they evaluated its location, its content and the users' navigation type. They found that the recognition of the format is influenced by the interaction of the banner with the website's content as well as the user's style of navigation. Specifically, participants whose navigation is not directed towards any specific goal are significantly more likely to recognize an ad banner that includes a URL address than the experimental subjects to whom little information is offered about the service plus the URL address. However, among participants with a goal-oriented navigation style, there are no significant differences shown towards the content of the two types of banner. The results also indicate that goal-oriented participants better recognize the ad than those with a free or exploratory navigation style only in the cases where the banner includes some information about the advertised service and its URL address.

3.2.3 Users' Characteristics

With respect to the individual characteristics that can influence the perception of the banner's efficacy, the variable *involvement with the product* stands out. Thus, users highly involved with a specific product are more likely to click on a banner that contains information about said product. On the contrary, in situations with a

low level of involvement, there is a smaller chance that a user will voluntarily view a message by clicking on a banner. Nonetheless, when the banner is animated, it is more likely that a user with a low degree of involvement with the product click on the ad. Therefore, in situations of high involvement with the product, banner animation does not influence the CTR (Cho and Leckenby 2003). The attitude towards the advertisement can affect the efficacy of the format, since those individuals who have a favorable attitude towards online advertising are more likely to click on a banner.

Another of the important user characteristics variable is their degree of experience with the Internet. Based on the idea that ease of use and usefulness influence and explain current and future behaviors of an individual towards electronic commerce (Chen and Tan 2004; Davis 1989), it is to be expected that a user's experience with a medium will influence their perceptions of usefulness and ease of use. Therefore, it will also influence the consumers' behavior towards online advertising. On the other hand, the Internet requires more cognitive resources that other written media (Cho 1999; Yu and Roh 2002), making it easier to overload users with little experience. Moreover, the more active and intense processing of information that is done on the Internet demands a higher level of interaction between the consumer and the message, as well as a greater cognitive effect, since use of the Internet entails deliberate actions to process information (Cho 1999). Therefore, it is to be expected that the Web user's experience will moderate the effect of the banner format on the communication process. The experience, consequently, will make users pay attention to ads at the beginning; once familiar with the design of the website, their attention will continually diminish as they stay on the site (Lapa 2007); also, the users' experience with animated banners will reduce the effect of animation on attention paid to the banner.

Additionally, the advertising message's relevance to the individual increases the intention of clicking on the banner (Cho 1999); this relationship is more intense among users that have a positive attitude towards the website. Relevant advertising will lead to a more positive attitude towards the ad; in this situation, users will be more likely to follow what is known as the central processing route to high involvement, as postulated by the ELM (Elaboration Likelihood Model) model Cacioppo et al. 1986). Furthermore, this will not affect the time spent on the results obtained on the website if the message is relevant for the individual (Lapa 2007).

Dahlen (2001) evaluated the impact of familiarity with the advertised brand on the efficacy of the banner, distinguishing between expert users and novices. From his study, it can be deduced that brands familiar to the user prior to exposure to the banner receive, on average, a greater number of clicks than advertised brands that are previously unfamiliar. For known brands, the number of clicks decreases with repeated exposure to the banner. For unknown brands, the number of clicks increases with repeated exposure. Inexperienced users click on the banner more often than experienced users. Less experienced users show larger changes in their knowledge and attitude towards a brand through the effects of a banner than those with more experience. This analysis could be of great importance to advertisers:

unknown brands should embark mainly on long-term campaigns, since that would allow a greater number of exposures to the ad; in contrast, known brands should focus on short-term campaigns, since ads lose their attraction quickly with the passing of time.

Within the research of the efficacy of banners as an advertising format, there is also a certain interest in discovering if there is a difference in the evaluation of its efficacy in terms of the culture of the message receiver. Thus, Möller and Eisend (2010) have revealed that advertising banners' efficacy, in terms of response capacity on the part of the consumers, is determined by cultural variables. From the four cultural dimensions analyzed in their study, individualism has the strongest effect on the attitudes towards the advertising banner. Consumers that come from individualistic cultures are less appreciative of and less likely to click on advertising banners than those from collectivist societies.

Finally, the user's gender can explain differing manners of behavior on the Internet. Men more often use the left hemisphere of the brain, which leads them to establishing global rules and categorical concepts of information during processing; women tend to process information with the right hemisphere, which leads them to think more about specificities and intrinsic values implied in the stimulus or information. Consequently, men seem to favor a holistic and undifferentiated processing, while women process in a more detailed and elaborate manner (Meyers-Levy and Malaviaya 1999).

4 Effectiveness of Advertising in Social Networks

As mentioned earlier, businesses use social networks to promote their products, improve communication with customers, and gain knowledge about the market. According to what has been observed,[1] from the use of SNSs as an advertising medium, the following noteworthy phenomena occur: (1) an *action-focused communication strategy* unique to the business, which materializes in the exhibition of products or services and the creation of events and activities; and (2) a *communication distribution strategy*, which provides and spreads content that is relevant for Web users, but that is not exclusively produced by the company. The latter is more interesting to users that consult businesses' profiles on social networks because the business makes content available that is not exclusively related to its own products or events, but is about news related to the sector or information relevant to the consumer.

Therefore, businesses, regardless of the strategy they decide to follow, must always concern themselves with spreading attractive and "impactful" content to the consumer. To do this, they make use of audiovisual content, promotions,

[1] See recent reports by ONTSI (Observatorio Nacional de las Telecomunicaciones y de la Sociedad de la Información) at: http://www.ontsi.red.es/ontsi/

discounts, updates, gifts, contests, etc. These tactics must be adapted to the unique possibilities offered by each of the social networks to allow businesses to project themselves publicly. Regardless of the business's intended use of the social network, the true asset of these media lies in the number of users interacting with them. Precisely for the scope of their social reach, social networks are increasingly catching the attention of researchers in online advertising.

Likewise, the rapid growth of SNSs fuels advertisers' search for new advertisement options (Hart 2007). This flowering industry finds itself in a difficult position, as it has to find a balance between its need to generate profits through publicity and the users' need to have uninterrupted experiences (Nutley 2007). However, there are still few studies that deal with the unique characteristics of advertising on social networks. Specifically, advertisements on social networks possess certain features that differ from other media due to the responses that are not considered strictly as personal actions, but rather as actions shaped by the characteristics of the community (Zeng et al. 2009). In this sense, there are several factors that influence the response to the advertisement. For example, the influence the social and group norms have on the attitudes of its members and, therefore, on how the individuals of the group express themselves. The identity of members in relation to the group and its social norms will moderate the intention to accept advertising within the group. Thus, in groups where the members have a strong sense of identity, social norms will have a positive effect on the users' intentions. The greater the sense of self held by the group members of an online community, the more likely the group will be to form an opinion about the advertisement (Zeng et al. 2009). Therefore, if businesses want to receive positive responses to their advertisements within SNSs, they must consider two factors that are key to the responses and behavior of the individuals: the ad's relevance and value within the community. Specifically, when users perceive the advertising message as relevant to the theme of the community as well as aligned with the representation of their social identities, the ad's presence will be seen as positive. This will garner more positive results (Zeng et al. 2009).

In line with earlier considerations, studies like Nielsen's (2010) have examined the value of advertising in communities on SNSs. To do this, an important distinction between formats was made in order to look at ads that were intended for the social network Facebook; this is the case with the ad on the landing page, composed of a creative graphic combined with an ad in text form. He also studied the use of ads on the home page that include social content allowing information about members of the social network to be added. Additionally, a format known as organic impression was used, which presents some claim or information about some of the members of the social network's preferences regarding the advertising campaign. These last two advertising formats are based on what is known as *earned media* or *publicity*, a concept that has been used in the evaluation of public relations for years. Historically, publicity has corresponded with the number of times that a brand or brand-related image appeared in the nightly news, the front page of a newspaper, a movie or a television program. Publicity's key lies in the brand not having paid for the exposure in any way. This means that the

communication has been sufficiently interesting, entertaining and has sufficient journalistic interest for the media to continue repeating the ad voluntarily. Therefore, in new social media with social content, like SNSs, the consumer is invited to broadcast or sanction the brand to their online contacts through actions such as becoming a fan or by showing their approval of an action by liking, retweeting or favoriting. This tendency makes the brands resort to advertising tools that come from means of social communication known as organic impressions. With this in mind, hybrid-advertising formats are being developed between paid and earned media communication (Nielsen 2010).

The results obtained by Nielsen (2010) indicate that, in terms of advertising efficacy, when paid ads contain some sort of social content, they produce a higher rate of remembrance, awareness and purchasing intentions. Furthermore, it has been observed that users exposed consecutively to a paid ad and an ad containing organic content show a three-fold increase in memory of the ad in addition to elevated purchasing intent. Additionally, the extent of advertising efficacy was evaluated exclusively in terms of the organic formats, based on the number of exposures (frequency) necessary to produce a response from the user. It was found that knowledge and purchasing intention continue to grow after ten or more exposures to the message. Specifically, there is a gap in brand familiarity between consumers exposed to the message three to nine times compared to those exposed ten times or more, with positive significant differences showing in this last category. This reflects the strong impact that organic impressions have on users, increasing the users' disposition to continue processing the messages during long periods of time. Therefore, the takeaway from this study is that, in order to maximize profit and potential from earned media, it is necessary to invest in advertising on social networks; after investment one must pursue positive actions on the part of users of the social network, as this adds social value to the add. Moreover, there is a strong relationship between the users of a social networks' rate of participation in a campaign and the number of organic impressions that said users make (Nielsen 2010).

Additionally, in order to generate a reaction of some kind to the advertising message in any of its formats, it is essential to capture the social network user's attention, keeping in mind the limitations of their attention. Specifically, some studies indicate that social network users do not notice advertising in the conventional forms that are used in other media (Soares et al. 2012). Up until now, users accepted a symbiotic relationship with conventional media (radio, television or press), in which the presence of advertisements in the medium was the price or remuneration for receiving content either free or at a reduced cost (Taylor et al. 2011). However, in SNSs this remuneration does not exist. This relationship has been modified because the advertisement intrusively interrupts the flow of the consumer's activity. This explains why a high degree of trust is given to advertisements that arrive via Word-of-Mouth (WOM) between users (Steyn et al. 2010). Because of this the options provided by social networks such as Facebook

like promoting ads or suggesting them to friends come into play (Murdough 2009). The benefits of positive WOM are important. It is estimated that each client who gets involved in the chain of WOM doubles the value of investment allocated to promoting a product or brand in comparison with ads sponsored by the brand. This behavior is able to convince twice as many clients to try or purchase the product. Nonetheless, businesses must be aware that negative WOM will have an inverse impact, even more powerful than positive WOM. It is therefore imperative to avoid negative WOM (see Trusov et al. 2010).

Recent research on advertising efficacy has focused on advertisement in social networks. Specifically, Wood (2012) notes that perceived emotions through the advertisement are predictive of the message's efficacy, in terms of outperformed persuasion, brand linkage and cut-through measures.

5 Concluding Remarks

Advertising assumes a strategic role for many businesses that use the Internet. In advertising the approach to, finalization and evaluation of objectives are fundamental. Objectives should not solely be approached in terms of sales, as the effect of advertising on individuals is not always reflected in direct sales. Other variables such as the improvement of attitudes or future preferences towards the brand are worth outlining and obtaining. This chapter points out the special importance advertising has taken on in the academic sphere, with the evaluation of certain online advertising formats (e.g., banner) being especially prolific. Moreover, several lines of research have been highlighted for their relevancy and interest. Next, theoretical conclusions and noteworthy practices are commented upon.

Firstly, as far as specific advertising formats goes, the banner and its variants are the most commonly used on the Internet today. Based on the literature review that we have performed, some recommendations can be made to practitioners so that they may properly use banner ads:

- Moderate use of banner animation. Excessive animation of the banner's content can awaken negative attitudes towards the ad that, in turn, unleash undesirable behaviors such as advertising avoidance.
- Banners must be located in the most visible zones of the webpage. The eye-tracking technique has proven to be very revealing on this idea. In occidental cultures, where the people read from left to right, the most-seen zones are located in the right margin, Moreover, the first pages of the navigation menu are preferable to the pages that require deeper navigation within a website content tree.
- The banner's content must be relevant to the user and should, therefore, be chosen based on their likes. Furthermore, the banner must be designed with the right kind of creativity.

- Forced exposure to the banner should be reduced. It is recommendable to encourage voluntary exposure to the banner. The literature shows that voluntary exposure produces a greater probability of the message being processed in a conscious and favorable form by the user. This increases other behaviors such as the level of attention paid to the message, the likelihood of clicking, recognizing and remembering the brand and generally improving the attitudes and behaviors of the users in relation to the banner and brand. All this allows the navigator to obtain more information about a product or service, thereby increasing the possibilities of a future purchase.

As for advertisement on SNSs, the key for businesses resides in exposure time and in the information offered by users. Currently, advertisements on SNSs are also essential for the execution of integrated-marketing communication campaigns. Below we present some practical suggestions:

- Using SNSs as a means to grab the client's attention or to house and centralize F.A.Q. is crucial. It is advisable to develop a climate that promotes the participation of consumers in the recommendation of products or services.
- SNSs prove to be especially interesting as tool for exploring the market. They are valid for product testing, launching new products or services and analyzing options.
- Social networks can provide information on the direction and tendencies of the market based on the changes observed in the consumers' likes.
- Due to the strategic value of these relationships, management and control of the SNSs should be assumed by professionals, hence the *importance of the community manager* (see Garrigos-Simon et al. 2012). In this respect, businesses should permanently engage once they have initiated activities in this setting. In other words, their strategies and actions must be planned and constant (Murdough 2009).

From the standpoint of greater monetization of SNSs through advertisement, the key is offering messages based in content that is both interesting and relevant to the user. The advertising innovation and creativity on SNSs can lead to voluntary and viral propagation of the advertiser's messages, increasing the impact on the business' target population. It is also important that SNSs make innovations in the use of metrics, allowing for better evaluation and control by businesses of their campaigns on social networks.

With respect to the academic sphere and advertising research, there is a definite gap between what is being investigated and the real problems faced by businesses in the world of Internet advertising. This gap is being increased by the current staggering proliferation of SNSs, which makes advertising research in SNs especially interesting. From here, the future lines of research are varied. Now we point out some proposals with potential:

- Establishing differences with regard to which categories of products are especially suited to be promoted via social networks must be done; another approach would be establishing if there are types of products or services not particularly fit for or not easily promoted through social networks.
- Determining what the key is to creating a message that will go viral and be spread in the interest of the advertiser is essential. The advertising clutter in conventional media is one of the main causes for lack of advertising efficacy since it increases the probability that the users will not process the message. In this vein, it is fundamental to identify if the user perceives socials networks as a medium with excessive advertising clutter and, if that is the case, to what extent this disorder affects the processing and efficacy of the advertisement.
- Evaluating the beliefs and attitudes generated by Internet and SNS advertising is necessary. There is a wide variety of advertising formats available on the Internet and in SNSs. It would be convenient to identify which of them could help achieve the proposed advertising goals, as well as which are more fitting for each proposed objective.
- Companies must note the users' type of access to the Internet and to SNSs. Soon mobile devices and mobile-adapted environments are going to become crucial for reaching consumers. For example, there is a clear tendency towards accessing SNSs on the go, through brief connections by means of mobile devices (i.e., smartphones and tablets). It is therefore of interest to analyze the efficacy of the advertisement in the mobile setting. Through mobiles devices, the advertiser can obtain precise information about the user's location by using technologies like geolocalization. Information about the user's whereabouts can provide an advantage to contextual advertising. In the same way, the noticeably smaller screen size of mobile devices constitutes a limitation that should be studied from diverse perspectives; e.g., the message's perceived intrusiveness, the possibility of message evasion, the improvement of advertising creativity, or the possible limitations and advantages that mobile technology can offer.

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A.1 6 Appendix

Summary of relevant conclusions on the variables that affect the efficacy of the banner format on the Internet

Physical characteristics of the banner		
Color (coherence)	• The banner's color in relation to its containing website affects the perception of coherency and affects attitudes towards the ad	Moore et al.(2005)
	• The incoherence between a banner and its containing website produces a favorable effect on memory and recognition, generating more attention and leading to a more thorough process of the message	
	• The font's color attracts attention towards the ad in cases of high contrast between the background and the font, while ads with low contrast do not affect attention	
Size or shape	• The larger the ad's size, the better the impression it makes on the consumer	Baltras (2003)
	• Horizontal banners work better than skyscrapers (vertical banners)	
	• The ad's shape is less important than its content	Dreze and Hussherr (2003) and Lapa (2007)
	• The banner's size is less relevant than the location it occupies within the website	Dos Santos (2007)
	• Users show a certain cognitive regularity in the processing of banners with distinct sizes. There is not empirical evidence that indicates that larger banners are more remembered than smaller banners	
Animation level: dynamic	• Animation generates greater attention, a greater number of clicks (CTR) and better recall	(Li and Bukovac, 1999)
	• Animation reduces blindness towards the banner	Bayles (2000)
	• Animation does not produce an effect on ad recognition	Bayles (2002)
	• Animation does not produce an effect on memory of recognition	Dreze and Hussherr (2003)
	• Having a dynamic banner is preferable to a static one as it generates greater attention	Sundar and Kalyanaraman (2004)
	• The animated banner is irrelevant as there is a tendency to ignore it	Burke et al. (2004, 2005)
	• It delays visual exploration and reduces memory	
	• Animation speed matters	Sundar and Kalyanaraman (2004)
	• Greater speed, greater attention	

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Physical characteristics of the banner		
	• Animation improves the attitude towards the ad but worsens the ad towards the product	(Sundar and Kim 2005)
	• Excessive animation can generate negative cognitive and emotional effects. If the banner is perceived as coercive, it causes skepticism and distrust, negatively influencing the user's attitude towards the website, brand or their intentions to revisit the site	Yun and Kim (2005)
	• Animation increases CTR, prolongs navigation time, and reduces the focus of the user's attention, causing them to examine fewer elements which affects their search process	Hong et al. (2007)
	• Dynamic banners are better remembered than static banners but this does not coincide with a significant effect on recognition of the message	Kuisma et al. (2010)
	• Negative effects of animation are moderated by loyalty to the website and by the users' need for knowledge	Thota et al. (2010)
Animation level: static	• Lack of animation attracts the users' attention, while the presence of animation increases the likelihood of clicking and purchasing	Hong et al. (2007)
Banner content		
Creativity	• Users prefer banners with short, clear messages to ones with long messages	Baltras (2003)
	• Promotions and encrypted messages to have an impact on visitors	
	• Complex creativity that lengthens download time has a negative influence, leading to users changing websites or to not seeing the ad	
	• Creative banners are more efficacious in terms of increased CTR when compared to large banners with large messages and an absence of promotional incentives	Robinson et al. (2007)
Incorporated graphic images	• Inclusion of visual elements such as a cursor (mouse) does not improve CTR	Lees and Healy (2005)
Source credibility	• Source credibility is vital for understanding the efficacy of online advertising. When a source is highly credible, there is an increase in the ad's relevancy, positive attitudes towards the brand and purchasing intentions	Choi and Rifon (2002)

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Physical characteristics of the banner		
Location within the website		
Page position	• Ads located in a website's periphery play a different role than those shown at the top of the page	Benway (1999)
	• Flash banners in a website's periphery accelerate the decision-making process, although users infrequently glance at them in response to their flashes	Day et al. (2006)
	• Peripheral banners, instead of attracting participants attention, elevate their arousal level, which in turn, increases their decision making speed when faced with a decision between several choices	
	• Users regularly remember a banner's content independently of its position	Dos (2007)
	• When sizes are similar, users better remember banners found at the bottom of the website over those found at the top of the page. Therefore, position outweighs size in terms of affecting memory	
Order of the webpages layout	• Users pay more attention to banners situated in the first pages encountered during navigation	Hsieh and Chen (2011)
	• The first page is always the best at attracting the users' attention towards the ad. However, the first text-based pages or mixed text/image-based pages are worse at capturing attention than pages based solely on video or images	
	• Navigating different pages, within a single website, with distinct types of information affects attention towards the ad. Also, users are more affected by the ad's content when it is placed on the landing page in comparison to any other page of a website	
	• In image or video based pages, attention towards the banner is reduced as the user follows the natural order of a site's distinct pages	
	• Websites with ads based in videos or images do a better job of capturing the users' attention than websites whose ads are solely based in text or in a mixture of text and images	
	• Video-based websites are the best at attracting the users' attention towards the ad	

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Physical characteristics of the banner		
Coherence with the website	• In the absence of coherency between the advertised products and the website, the message will largely be seen as irrelevant and little interest will be aroused. This results in a lower CTR.	Cho (1999)
	• Coherency between the advertised product and the website's content has an effect on the sources credibility • In the case of highly credible businesses, coherency between advertised and website product will lead to the banner being more persuasive • Businesses with low credibility do not benefit from banner-website coherency	Kim and Choi (2010)
Exposure level	• Banner repetition increases recall and recognition. It also improves affect and the user's cognition towards the ad	Yaveroglu and Donthu (2008)
User characteristics		
Gender	• Men mostly use the left hemisphere of their brain, which leads to them establishing global rules and categorical concepts during information processing • Women tend to process with the right hemisphere, which leads to them fixating more on specificities and intrinsic values implied in the stimulus or information • Men process holistically and with a general approach, while women process advertising messages in a more detailed and elaborate fashion	Meyers-Levy and Malaviya (1999)
Influence of user's culture	• Individualism has a high explanatory power of attitudes towards a banner ad • Consumers who come from individualistic cultures value banner ads less and less likely to click on them than consumers from collectivist cultures	Möller and Eisend (2010)
Web experience	• High Internet expertise users will tend to unconsciously ignore banner ads when developing a sequential navigation process.	Burns and Anderson (1993)
	• Less experienced Internet users click on banners more often than more experienced users • Less experienced users show higher levels of change in their knowledge and attitude towards a brand based on their interaction with a banner than experienced users	Dahlen (2001)

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Physical characteristics of the banner		
	• The effect of experience with animated formats can reduce distraction, produced by the animation, from the user's task	Hong et al. (2007)
	• The user's level of experience with animated banners reduces the animation's effects	
	• When users lack experience with a particular website, they pay greater attention to ads during their first visits	Lapa (2007)
	• After familiarizing themselves with a website's design, the user's attention continually diminishes	
Familiarity with the brand or product	• Familiarity implies growing accustomed to a stimulus, paying less and less attention to it	Cacioppo et al. (2007; pág. 166), Sternberg and Mio (2008, p. 137)
	• Familiarity occurs automatically and does not imply conscious effort. Thus, the stimulus's relative stability and familiarity govern this process	
	• Ads from known brands receive, on average, a greater number of clicks than ads from unknown brands	Dahlen (2001)
	• For known brands, the number of clicks decreases with repeated exposure to the banner	
	• For unknown brands, the number of clicks decreases with repeat exposure	
Involvement with the product or task	• At low levels of involvement, animation increases CTR	Cho and Leckenby (2003)
	• At high levels of involvement, animation does not influence CTR	
	• At high levels of involvement, the odds of the user clicking on the banner are increased when it contains information about the product	
	• In cases of low levels of involvement with the product, the odds of the user voluntarily seeking exposure to the banner by clicking on it is lower	
	• Involvement leads to higher levels of memory and recognition	Yun et al. (2004)

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Physical characteristics of the banner		
Relevance of the message	• Relevance does not increase distraction • Relevance increases CTR in users with a positive attitude towards the website.	Cho (1999)
	• Relevance leads to a positive attitude towards the ad. When a message is relevant for users, they will tend to follow the so-called central route, as shown by the ELM model	Lapa (2007)
	• If the message is relevant, time spent by users at the website does not affect their attitude towards the message or its efficacy	
Attitude towards the brand	• Attitude towards the ad is affected by the ad's dimensions of evasion, which change depending on the degree of forced exposure to the ad	Fang et al. (2007)
Type of navigation	• For users who navigate in a task-oriented manner, ads with animation diminish the users' efficiency. In this case, animation also negatively affects users' perception of the ad	Hong et al. (2007)
	• In the case of exploratory navigation, the negative effects caused by animation are worse than in the case of purpose-drive navigation	
	• In the case of free or exploratory navigation, the longer the exposure time, the better memory and recognition of the ad are. This is effect is lesser in the case of users with goal-directed navigation	Danaher and Mullarkey (2003)
	• Participants navigating freely recognize banner ads that include a URL address significantly better than banners with information about the advertised service but without a URL address	Calisir and Karaali (2008)
	• Users navigating in a goal-oriented fashion, show better recognition of ads compared to users with exploratory behavior only when the banner includes some information about the advertised service and a URL address	
	• For participants with a goal-directed navigation style, there are no significant differences in recognition of the banner's distinct content types	

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Physical characteristics of the banner		
Type of position	• Voluntary exposure to the ad, captures the users' attention and activates the cognitive learning process more intensely than involuntary exposure • Clicking on the banner is a precondition for beginning of the active processing of information. This, in turn, has positive effects on memory and therefore, on the degree of memory about the ad	Cho (1999)
	• Forced exposure to a banner makes the user perceive the ad in a more explicit manner. It also increases CTR and attention paid to the banner • If exposure of a banner is forced upon a user, it can generate a favorable attitude towards the ad and the brand. This furthermore produces an increase in purchasing intention • However, at certain levels of forced exposure, feelings of annoyance arise as well as irritation, which induces evasion (e.g. cognitive and physical)	Cho et al. (2001)

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Online Advertising Intrusiveness and Consumers' Avoidance Behaviors

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Abstract The proliferation of advertising in all communication media causes consumers to perceive a significant amount of competitiveness between advertised products, as well as to feel overwhelmed by the intrusiveness of their advertisements. When taken together, these dimensions form the concept "advertising clutter." A review of the literature shows that perceived intrusiveness is the main component of the perception of clutter. Advertising clutter can prompt undesired behaviors (e.g., advertising avoidance) as well as attitudes contrary to those that companies' advertising campaigns hope to achieve. It also leads to diminished advertising efficacy in terms of consumer memory, a decrease in positive attitudes towards the message and brand, as well as declined purchasing intention and, therefore, sales. In this article, the main consequences of advertising clutter for consumers in online media are reviewed and discussed. To that end, a theoretical review of this concept and its main dimensions is performed; special attention is paid to the online context. Finally, some practical recommendations and research opportunities are pointed out.

Keywords Intrusiveness · Online advertising clutter · Irritation · Avoidance

1 Introduction

Currently, the Internet holds a special place as a medium for its ability to attract advertising investment; businesses are increasingly transferring funds from conventional media to the Internet (Nielsen 2012). This is due to advertisers' loss of

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faith in mass communication media like television, radio, print, etc. One of the main reasons for the loss of advertising efficacy in conventional media is that consumers are saturated by the quantity of ads and their largely persuasive style (Elliott and Speck 1998; Hong 2006). These circumstances produce certain behaviors and attitudes towards the ad and brand that are contrary to the desires of the businesses (Ha and McCann 2008a, b). One of the most common effects is advertising avoidance. This article focuses on the analysis of the consumers' perceived intrusiveness of advertising and the ensuing behaviors of evasion that said perceived intrusiveness could generate in the online media. In an online setting, the specifics of advertising, especially when compared to typical advertising in traditional media can boost the consumers' perception of intrusiveness to a greater extent. Specifically, special attention is paid to demarcating the main perceptions that evoke evasive behaviors in the consumers as a defensive mechanism in response to online advertising. These perceptions run contrary to the advertising campaigns' objectives. Some of the consumers' physical and mental states that can drive avoidance of online advertising are: perceived intrusiveness, irritation and a perceived lack of control of navigation.

The remainder of the article is as follows. First, a description of the concept of advertising clutter is made, analyzing its main sources and components. Perceived advertising intrusiveness, one of the most commented-upon dimensions in the literature, is highlighted; this concept is reviewed in this article, both in general and for online environments. Next, the concept of advertising avoidance, one of the most significant negative emotional responses that might potentially arise in consumers exposed to online ads, is introduced. Finally, several conclusions, recommendations for practitioners and research opportunities are highlighted.

2 Background: Advertising Clutter

Advertising clutter, in terms of both conventional offline and online media, has been widely studied. According to Ha (1996), the perception of clutter corresponds to the advertising density of a media and is contributed to by three variables: *advertising overload*, *intrusiveness (reactance)* and *competitiveness* (*interference*). The current levels of advertising density can explain the ever-shrinking efficacy of advertising. In situations of high density, there are too many brands in one medium competing for the attention of the consumers, the users of said medium. Under these circumstances, there is a high chance that the users of the medium's attention will worsen, which, in turn, might generate non-desirable effects on memory, attitude or behaviors towards the ad, the advertised product or the medium in which the ad appears. Analysis of the literature reveals that the study of advertising clutter in distinct media is primarily done from the standpoint of ad-processing and the effects the ads have on variables such as: recall of the advertised brand and/or the advertisement, awareness, attitude, willingness to buy the advertised product, etc.

Ads, therefore, compete with the content of the communication medium that houses them for the users' attention. The main studies show poor results in consumers' memory in media where a high level advertising clutter is perceived; this usually happens within communication media that are not favorable for consumers' processing of ads' messages. In this setting, the consumer can develop negative attitudes towards the advertisement (Ha 1996). One of the main findings from the study of the advertising clutter phenomenon is that the short-term profits that a medium (e.g. certain TV channels) can see from selling a lot of advertising space/time to businesses and broadcasting their messages might not pay off in the long run. This results from the audience's advertising saturation, which in the short-term reduces advertising efficacy and in the long-term generates negative attitudes towards advertisements that appear in the medium. Nevertheless, despite the audience's dislike, the media have to endure the perception of advertising clutter, since advertising is the their main income source (Ha and Litman 1997).

In order to explain the perception of clutter in any medium, it is essential to consider the distinction that Ha and McCann (2008a, b) draw between different types of communication media and their form of presenting the ad. Thus, we can distinguish between media that allow the auto-consumption of information, in other words, media that allow the user to decide the rhythm and type of information that they want to see (e.g. in print media) and captive-media like (e.g. radio, television), that force the consumer to face the information at a determined rate. The case of the Internet is unique due to its special characteristics that can offer users both options; depending on the ad format used, the perceived level of advertising clutter will fluctuate (Ha 2003).

With the goal of making a generalization about the term "clutter" in offline and online media, Ha and McCann (2008a, b) performed a meta analysis, analyzing the term clutter in relation to three complementary perspectives: structural, information-processing and functional. Below they are briefly introduced.

The *structural perspective* focuses on the study of the physical characteristics of the ad in the analyzed medium. The major findings on this dimension of clutter are (Riebe and Dawes 2006): advertising overload can lead to, first, low rates of memory of the ad by the audience; and, second, a perception that the medium presenting the ad is of low quality. Additionally, similar results can be found for the clutter's dimension competiveness. Competiveness is characterized by the rivalry between advertisers, expressed through the number of advertising messages and different brands there are for a certain product category. In the specific case of media that do not force ads on the user (e.g. Internet or magazines), the effect produced by the dimension of competitiveness is slight. This enables the user to easily move between the medium's content and overlook the between-brand competition.

From the perspective of *information processing*, advertising clutter's impact determines the consumers' ability to process the message (Brown and Rothschild 1993; Ray and Webb 1986). This phenomenon can be explained through diverse psychological theories on information processing. First, the *overload theory* postulates that a reduction in advertising efficacy occurs due to people's limited

capacity to process a message. From the cognitive psychology point of view, when a user finds him/herself faced with a choice of brands, and the medium is overloaded with advertising information, the processing of a message/ad is done at the expense of another message/ad (Schneider et al. 1982).

Similarly, the *selective attention theory* offers an explanation for how consumers break free from the captivity of the limitations imposed by a medium. The theory points out that selective attention is the product of a protection mechanism that allows human beings to allot their limited attention resources according to their needs (Smith and Buchholz 1991; Wickens 1991). Therefore, the decision not to pay attention to ads is the result of the consumers' perception that the ads are not pertinent to their lives. Thus, their mental processing resources are reserved to pay attention to the editorial content of the medium, which is what interests them, not the advertising content (Ha and McCann 2008a, b). Another of the theories widely used in cognitive psychology applied to the processing of advertising messages is the Elaboration Likelihood Model (ELM) (Petty and Cacioppo 1981). The ELM explains the effects of advertising through message processing. In high-involvement conditions, the consumer processes the information through the central route; however in situations of low involvement, the peripheral route is used. Specifically, if consumers are very involved with the advertised product, it is more likely that exposure to the ad will lead to processing the message through the central route, investing greater effort in processing the message and developing ideas about the brand or product. On the other hand, in consumers slightly involved with the advertised product, the information processing follows the peripheral route; this explains why an ad's elements like color and execution are more relevant in determining the result of the message in this type of consumer. In this sense, and regarding advertising clutter, it has been observed that if consumers process an advertisement in an ad-saturated medium, an appropriate use of peripheral signals can be a decisive factor in terms of advertising efficacy and memory (Ha and McCann 2008a, b).

The theory of *psychological reactance* is employed to explain resistance towards and evasion of obstacles that impede the user of a medium from enjoying their liberty. This type of behavior is frequently observed in consumers when they are forced, without their consent, to view advertisements (Edwards et al. 2002). According to Brehm and Brehm (1981), psychological reactance implies a negative reaction from consumers when they perceive that something is depriving them of their liberty. Thus, when a user is exposed to an advertisement in such a way that they perceive the ad as depriving them of their liberty to enjoy the medium's content of interest to them, the consumer will tend to reject the advertising exposures. Consequently, they would try to avoid all of the medium's advertisements (Bhattacharjee 2010).

From a *functional perspective*, emphasis is put on the active role that the consumers of a medium play in processing advertising messages. This perspective aids in understanding how motivations can drive the use of media and determine how messages are processed. When one tries to explain the motivations for the use for certain media, some theories prove to be particularly revelatory. One of them is the

uses and gratifications theory, which is employed to explain the motivations for use of media such as television, Internet and current social networks (Bonds-Raacke and Raacke 2010; Roy 2009; Rubin 1983; Ruggiero 2000; Stafford et al., 2004).

MacInnis and Jaworski (1989) suggest that the process of advertising communication is based in need, motivation and the consumer's opportunity to process the ad. Thus, when an ad complies with the user's motivations, the advertising message is seen as a useful offering of information about the product, or even as a part of the medium's entertainment. In this scenario, the consumer will not see the ad as something negative (MacInnis and Jaworski 1989). Therefore, if the medium aligns with the motivations for use and rewards the users, the advertising content will be desirable, as it is useful for the consumers. On the other hand, in a situation where the consumer perceives advertising clutter in a medium, if the effort required to avoid the ad and the risk of missing the medium's content are high—this largely happens in media that make the spectator a captive of the ad, e.g. television—, then it is likely that the consumer will try to avoid the medium altogether (Ha and McCann 2008a, b).

Independently of the perspective of analysis, the effect of advertising clutter on users of a medium varies according to the perception of each individual. It is this individual perception that determines the non-desired impact of the clutter on the processing of the message (e.g. negative attitudes towards the ad). In the end, advertising clutter (and intrusiveness, its main dimension) is considered key to the evaluation of advertising effectiveness. It is crucial to bear this in mind when designing communication campaigns, assessing the level of ad clutter of each medium and the non-desirable effects that it can have on the campaign's efficacy (Hammer et al. 2009). This will provide information that is useful for ascertaining which media are the most suitable for launching advertising campaigns.

3 Perceived Intrusiveness in Online Advertising

3.1 Conceptual Introduction

Intrusiveness is considered one of the most important dimensions of the perception of a medium's advertising clutter (Edwards et al. 2002; Ha 1996; Nelson and Teeter 2001; Sipior and Ward 1995), a key factor in explaining the consumer's behavioral response of advertising avoidance. It is defined as "the degree to which advertisements in a media vehicle interrupt the flow of an editorial unit" (Li et al. 2002; p. 39); i.e., when a user is taken away from their reason for navigating the Internet or from their reason for visiting a specific website by being cutoff by an advertising message. Also, the perception of intrusiveness can be heightened when an individual has little time to accomplish a task in a medium. Therefore, the users of a medium will have to evade advertisements when they are perceived as intrusive. In summation, the perception of intrusion is the materialization of a

mechanism by which the ad causes annoyance and triggers emotional reactions in the user, possibly driving the user to advertising evasion (Edwards et al. 2002). In other words, perceived intrusion is a measure of how distracting an ad is and of the consequent wandering of attention from the user's task (McCoy et al. 2008).

An analysis of the literature allows perceived intrusion to be approached from diverse perspectives that we detail next.

Interference with private life. In relation to the consumer's privacy, intrusion could be defined as an invasion into an individual's solitude, including intrusion into private subjects (Nelson and Teeter 2001; Sipior and Ward 1995). From this perspective, the perceived intrusion of the ad could be defined as the degree to which the non-desired marketing interferes with an individual's cognitive process and task completion; also the degree of interference with the content of the medium being viewed. In this vein, authors such as Sheehan and Hoy (1999) observed that consumers do not consider ads intrusive if they have previously contacted the advertiser responsible for the ad. The non-desired ads, those that appear without the user's permission, could be considered an encroachment on the user's privacy. One of the main conclusions is that consumers tend to consider ads intrusive if they are not familiar with the advertisers or if they are not expecting to receive ads (see Milne et al. 2004).

The following approach is related to *cognitive process and task performance*. The most relevant studies of the term *intrusion* make use of it (e.g., Ha 1996; Li et al. 2002). It has been found that the intrusion of an ad during cognitive processing could cause the user to perceive the ads as harmful. In general, the experimental research into this issue has tried to identify the determining factors of the consumers' response when faced with an interruption of their specific tasks. In this case of disturbances on the Internet, a rise of intrusive feeling can drive the user to complete evasion of the advertising format in order to finish their planned tasks (Mormoto and Chang 2009). Therefore, it is essential to evaluate what situations or circumstances lead to online advertising being perceived as interruptive to the users' navigation experience. It has been concluded that the perception of task interruption depends on the type of navigation being done (goal-directed versus exploratory) as well as on other factors such as (Edwards et al. 2002; Moe 2006): the characteristics of the advertising format, the moment of interruption, the factor that causes the interruption, and the context and cognitive intensity with which the user is performing his/her task.

The third perspective from which advertising intrusion has been studied is related with the *content of the communication media* (Ha 1996). From this perspective, the perception of an ad's intrusion is tied to the user's motive for accessing the medium's content. In other words, in order to observe the level of annoyance that the advertising message arouses in an individual, it is necessary to also understand the motivations or objectives that have brought the user to access the medium that is broadcasting the ad. From these possible motivations and objectives Ha and McCann (2008a, b) highlight the following: information, entertainment, purchasing and exploration. Therefore, if these objectives, depending on which explains the purpose of the user's navigation on a case-by-

case basis, are perceived as being interrupted by ads, the perception of intrusion will be present.

3.2 Perceived Intrusiveness and Online Advertising Formats

Currently, the common individual frequents different communication media. Each individual is subjected to advertising messages, presented through various media formats. On the Internet, ads can be considered even more annoying that in traditional media; this is the case, for instance, of the massive and uninvited advertisements delivered through spam. In Table 1, a concise review of the most relevant studies on the subject of the consumer's perceived intrusiveness is shown; moreover, details are provided about diverse advertising formats that have been analyzed.

Until now, most of the research that studies how interruption of the user's tasks or objectives affects their attitudes of advertisement processing has based its analysis in experimental methodologies. Generally, this research tries to identify the factors that determine the consumers' response when their tasks are interrupted. In this vein, some studies have identified which characteristics of a stimulus result in interruption of the task at hand. Since users normally have a specific task when viewing a website's editorial content (written), the interruption caused by the online ad can be seen as even more intrusive than in other conventional communication media (Li et al. 2002). As a result of the interruption, users can show negative feelings towards the ad in general or might perceive the advertised brands in a negative light. They will consequently develop unfavorable attitudes towards purchasing the advertised brands (Batra and Ray 1986; MacKenzie et al. 1986). Furthermore, these negative attitudes can drive the user towards complete evasion of the advertising format in order to finish their planned tasks (Mormoto and Chang 2009). Hence, as previously said, it is necessary to know what causes the ad to be perceived as disruptive to the user's experience. To do this evaluation, issues such as the user's type of task or navigation style should be considered.

As can be observed in Table 1, the study of ad intrusiveness has frequently focused on several ad formats, a priori considered intrusive, such as pop-ups, interstitials and spam (Edwards et al. 2002; Fuxi et al. 2009; Li et al. 2002; McCoy et al. 2008; Morimoto and Macias 2009; Truong and Simmons 2010; Ying et al. 2009). Different advertising formats have been observed providing differing levels of perceived intrusion. Some formats have the capacity to mix their content with that of the websites that house them; other, like interstitials, are designed to forcefully interrupt the user's flow thereby capturing their attention (McCoy et al. 2007, 2008; McCoy and Fernández Robin 2011).

The interest in evaluating distinct advertising formats stems from the desire to understand which format arouses only a minor perception of intrusion in the consumer, thereby not hindering the goals of the ad. McCoy et al. (2008) distinguish between ads that do and do not obscure the website content. They noted that banner ads, in their different variations, do not hide website content, or in other

Table 1 Studies on the users' perceived intrusiveness in online advertising

Studies (chronological order)	Analyzed ad format	Related variables	Research aims and main findings
Li et al. (2002)	• Pop-up interstitial • Television Commercials • Magazine Ads	*Consequences:* Irritation • Cognitive evasión • Behavioral evasion	• A measurement scale for perceived intrusiveness (8 items) is validated.
Edwards et al. (2002)	• Pop-up interstitial • Different exposure times: ten and twenty seconds	*Antecedents* • Cognitive intensity • Editorial-ad congruence • Duration of interruption • Ad entertainment • Ad informativeness *Consequences* • Ad irritation • Ad avoidance	• Evaluation of cognitive intensity in relation to the degree of perception of intrusion. • A direct correlation is observed between the degree of cognitive intensity applied to the user's task-at-hand and the perceived intrusion. The greater the cognitive intensity is, the greater the perceived intrusion experienced will be. • Feelings of irritation and ad avoidance are consequences of perceived intrusiveness. • When ads are perceived as informative, the viewers' perception of ad intrusiveness is lower. So, the more value (information or entertainment) viewers perceive in an ad, the less intrusive it is perceived
Morimoto and Chang (2006)	• Commercial E-mail and direct postal mail	*Independent variables* • Intrusiveness *Dependent variables* • Ad Irritation • Attitude towards Spam • Ad Skepticism • Ad Avoidance	• Unsolicited commercial emails are more irritating than direct postal mail. • The theory of reactance in the context of email and postal mail with commercial ends is not completely supported. This explains why reestablishing control is not one of the habitual behaviors observed in the recipients of these advertising formats. • The more intrusive an e-mail is perceived as by an individual, the stronger his/her reactance against it will be. Consequently, the worse his/her attitude towards it is, the stronger his/her avoidance response will be.

(continued)

Table 1 (continued)

Studies (chronological order)	Analyzed ad format	Related variables	Research aims and main findings
McCoy et al. (2008)	• Pop-up interstitial • Online formats	*Manipulated variables* • User's control to close ad • Obscuring of site content *Consequences* • Irritation • Attitude towards website • Behavioral Intention • Advertisement content recognition	• Perceived control over closing the ad as well as obstruction of the ad influence recognition of the ad; this influence is direct and positive in the case of control and negative in the case of obstruction. • Intrusion is considered an antecedent of irritation. In turn, irritation is a direct antecedent of attitude towards the website and an indirect antecedent of the user's behavioral intentions (revisiting or recommending the website to others). • If ads are included that obscure site content, it is important to provide the user with the control to remove them.
Fuxi et al. (2009)	• Different types of ad formats from 500 distinct webpages	*Manipulated Variables* • Size and shape • Web advertising characteristics • Format	• Modeling perceived intrusiveness using artificial neural networks. • Perceived ad intrusiveness is influenced by several factors. Features of the ad and the hosting website (e.g. semantic and color differences) are also analyzed. • A three layer neural network is proposed. The model has high accuracy, based on the simulation results.
Morimoto and Macias (2009)	• Direct marketing using unsolicited commercial e-mails	*Independent variables* • Intrusion *Dependent variables* • Attitude toward the brand • Advertising evasion • Attitudes toward advertising medium	• The greater the perceived intrusiveness of an unsolicited commercial email is, the more the consumers' reactance will be. Such reactance causes ad avoidance and negative attitudes.

(continued)

Table 1 (continued)

Studies (chronological order)	Analyzed ad format	Related variables	Research aims and main findings
Ying et al. (2009)	• Interstitials (pop-up and pop-under)	*Manipulated variables* • Content congruence • Appearance rate • Frequency • Quantity • Content page integrity • Sound effect • Size • Animation effect	• Perceived intrusiveness of ads can be controlled through manipulation of certain aspects of the ad such as: its value to the user, placement and quality of execution. • When an ad provides value, in other words, when it is considered informative or entertaining, it is perceived as less intrusive. • It is equally as positive for the advertisers as for the consumers that pop-ups are related to the website's content. • If the frequency and quantity of ads is carefully controlled, they will be perceived as less intrusive. • The congruence between a website's content and the ad content were not significant in this study. In other words, advertising creativity does not have to match the website's content for it to be effectively perceived or remembered by the user. • The execution of the ad, in other words, the perception of it being well or poorly done, shows no effect in this study. The same is true for the ad's sound. Nevertheless, the ad's size does influence the perception of the message. • There is a direct and proportional correlation between how intrusive an interstitial is perceived to be and it's duration. The longer the ad is, the more intrusive it is considered.
Truong and Simmons (2010)	• Digital advertising in mobile environments	Qualitative analysis of 20 individuals on the perceived intrusiveness of advertising in mobile media.	• The exploratory analysis shows that banner, pop-up, spam and disingenuous email are the advertising formats most negatively viewed by the audience.

(continued)

Table 1 (continued)

Studies (chronological order)	Analyzed ad format	Related variables	Research aims and main findings
Goldfarb and Tucker (2011)	• Highly visible advertising and context-based advertising (e.g., Google Ad sense)	*Manipulated variables* • The ad's content (oriented or non-oriented • Visibility (high vs. low) *Independent variables* • Gender • Hours spent on the Internet • Age • Income *Dependent variables* • Purchasing intention	• Ads that appear frequently (highly visible) are considered annoying. Both highly visible and context-based ads work better when used separately. • The fact that context-based ads and high visibility ads (e.g. display ads) are best used separately is even truer for individuals who want a high level of privacy on the Internet. • Context-based ads are more tolerated as they are more likely to offer better information.
McCoy et al., (2012)	• Causal model of online advertising intrusiveness and irritation	*Manipulated variables* • Attitude towards the ad • Repeated exposure of the ad *Dependent variables* • Ad Irritation • Ad intrusiveness • Intention to revisit the website • Intention to recommend the website to others. • Performance level in successfully completing several tasks on the website.	• A model is proposed to ultimately predict, on the one hand, the users' intentions to return to the website and recommend the site to others, and, on the other, his/her performance in successfully completing information retrieval tasks on a website. These variables' direct antecedents are ad irritation and ad intrusiveness. • The proposed model is capable of explaining up to 50% of the irritation produced by the message. • Six of the eleven hypotheses that compose the model are supported. So, the proposed model is only partially supported.

(continued)

Table 1 (continued)

Studies (chronological order)	Analyzed ad format	Related variables	Research aims and main findings
Varnali et al., (2012)	• SMS-based mobile advertising campaigns	*Manipulated variables* • Message Characteristics (prior permission, incentive). • Individual Differences (content involvement, prior experience, perceived medium-fit) *Dependent variables* • Perceived intrusiveness • Attitude towards the campaign	• Both the existence of an incentive and prior permission positively influence campaign outcomes. • Perceived medium-fit components (e.g., perceived brand-medium fit) and content involvement are strong predictors of consumers' perceived intrusiveness of an SMS-based advertising message. • There is no relationship between consumer's campaign attitude and their perceptions regarding brand-medium fit, which is mostly influenced by content involvement. • Prior experience with the mobile medium has no relationship with the attitudinal reactions towards the campaign. • Perceived brand-medium fit is the strongest predictor of the affective response caused by an advertising message.

words, they do not block it from view; other online ad formats like pop-up ads, however, do appear in the user's screen, obscuring website content. In their study, they found that the level of perceived intrusion could predict attitudes towards the website and behaviors like intention to return to the page. It is also seen that the perception of intrusion is directly related to ad recognition. This distinction between ads that do and do not obscure the website content allowed authors to verify that pop-ups that block content produce higher rates of perceived intrusion than conventional pop-ups, resulting in their being more irritating for users. Recent studies explore the premise that ads are more intrusive when they have such characteristics as (Smith 2011): being poorly executed, being too long or large or being located in a medium that users already perceive as having too many ads, being overrun by pop-ups (clutter overload) or having an advertising style inconsistent with the containing website, among others.

With regards to an advertising message's characteristics or content, it would be reasonable to think that they influence the effectiveness of the ad and the user's response. Ducoffe (1996) points out that a message's characteristics have to provide some important value to the consumer. Thus, the informational value meets the consumers' need for utilitarian value and cognitive value, while the entertaining information covers the hedonistic and emotional value of the message (Brown and Stayman 1992; Edwards et al. 2002). Information or entertaining ads are perceived as less intrusive, as the informational characteristic shows a large effect on the concept of intrusion. This explains why individuals looking for an ad to be informative are more oriented towards the completion of a task (Ducoffe 1996; Xu et al. 2008). In the same vein, Smith (2011) concludes that ads that put forth content not related to information sought by the user are perceived as more intrusive.

The ad's location and frequency of exposure also affect the perception of intrusion, since users want their experience to conform to their expectations of the site being navigated. Thus, when the users feel that they are too frequently subjected to ads, they tend to view the ads as thwarting their navigation. This, as well as having too many ads in too small a space, can lead to feelings of irritation (Morimoto and Macias 2009).

3.3 Perceived Intrusiveness and Negative Attitudes

The perception of and attitudes towards a brand can be damaged by the perceived intrusiveness of ads (MacKenzie and Lutz 1989). Together with the perceptions about the ad's content, attitude towards advertising is used to evaluate the effects of an ad; consumer's attitude towards advertising can also moderate the response to a specific message (MacKenzie and Lutz 1989) and can differ between media (Elliott and Speck 1998). It is understood as the learned predisposition to respond favorable or unfavorably to an ad (Pollay and Mittal 1993). Morimoto and Macias (2009) point out that perceived intrusion directly influences behaviors towards an

ad. Furthermore, responses to advertising stimuli are also moderated by the individual's affective responses towards the ad. The relevancy or interest of an ad to the individual can also moderate the level of perceived intrusiveness. Thus, if an ad is relevant or of interest to a user, the perception of intrusion will be lesser (Wehmeyer 2007).

The consumer's attitude towards where the ad is shown is also going to play a part in their response to the ad. According to Cotte et al. (2006), Internet-based environments, whether they have advertisements or editorial content, also have a hedonistic value for the navigators. It is therefore recommendable that the advertising content within be coherent with this value. As previously stated, if the ad is in line with the values the consumer is looking for, the ad ceases to be seen as intrusive and does not generate negative responses (Edwards et al. 2002).

Another negative emotional reaction related to the individual's perception of intrusiveness of online advertising is irritation. For example, it can be irritating if a user has to close an ad in order to continue viewing the content of the website hosting the ad. This irritation can emerge if the consumer is unable to close an ad and is, therefore, obligated to view the ad (e.g. video, animation) or simply wait for the ad to disappear. On the other hand, in the time it takes to close an ad the user stops paying attention to the website and starts focusing on the advertising stimulus. This proves inconvenient for the user, as it requires a greater cognitive effort (Edwards et al. 2002).

There seems to be a correlation between the perception of an ad as irritating and its perception as intrusive. The aspects of an ad that can cause irritation have been studied although the psychological mechanisms that can elicit these feelings have not been reviewed in great detail. According to Aaker and Bruzzone (1985), irritation corresponds with the sensation of displeasure that consumers experience when faced with diverse forms of advertising stimuli. It is important to note that irritation has nothing to do with the value of an ad in and of itself, but rather with the negative emotional reaction the consumers have towards the ad. Said negative reaction is what causes users to perceive the ad as intrusive (Edwards et al. 2002; Wehmeyer 2007). Various factors have been identified in the literature as plausible causes of irritation to the consumer such as: the type of product advertised, the intrusion of the ad and the loss of control perceived by the user (Aaker and Bruzzone 1985; Edwards et al. 2002; Ha 1996; Li et al. 2002; Stayman and Aaker 1988), the ad being directed at the wrong audience, manipulative messages, delays caused by ads being place in inappropriate spaces, excessive repetition during a short period of time and forced exposure to the ad (Rotzoll et al. 1996; Li et al. 2002).

For a user to sense that an ad is intrusive, he or she must see the ad as interrupting his or her experience or navigation in the medium, i.e., a certain website. Interruption can generate negative attitudes, results of the ensuing psychological reactance. This tends to make the user try to reestablish control over navigation, avoiding the ad and reducing the possibilities of processing the message (Edward et al. 2002). Thus, based on the psychological reactance theory (Brehm and Brehm 1981), it can be argued that users will try to reestablish their

independence when they notice that an ad is disrupting their freedom to navigate a website; their defensive behaviors will lead them to avoid or close the ad that incites this conflict. Similarly, when a message stays on the screen for some time, the navigator becomes a captive of the ad. This can bring the user to abandon their initial navigation purpose or even to engage in avoidance behavior such as leaving the website. In this scenario, if an ad does not offer ways for the user to eliminate or close it, it interrupts the user's purpose of navigation; on the other hand, if it can be closed, the perceived interruption will be minor. The possibility to close an ad is an example of what some authors call "control over an ad" (McCoy et al. 2008). Therefore, the lack of perceived control over online advertising is related to not being able to close the intrusively perceived ad. Nevertheless, if an advertising message obstructs but does not fully block the website's content, closing the ad will not be necessary and the message will only be considered an interruption (Goldfarb and Tucker 2011). Some authors like McCoy et al. (2008) point out that consumers might even consider the mechanisms for controlling or closing an ad as intrusive. The goal is that users will have to voluntarily act to close the ad, when what they really want is not to have advertisements.

4 Advertising Avoidance

4.1 Brief Overview

Various negative perceptions sometimes aroused in consumers by advertising have previously been noted. These perceptions influence the formation of attitudes towards the ad and brand, although, fundamentally, they are the trigger that unleashes the user's mechanisms for advertising avoidance. Next, the general concept of advertising avoidance in online environments is introduced and analyzed.

From a psychological point of view, behavior and intention are influenced by attitudes (Eagly and Chaiken 1993). Similarly, the behaviors resulting from the processing of the advertising message are preceded by cognitive and emotional evaluations (Vakratsas and Ambler 1999). If cognitive and affective responses are negative, it is logical to expect a negative behavioral response as well. The kind of negative response we focus on here is known as advertising avoidance. Speck and Elliott (1997) define it as the users of a medium's reaction to reduce exposure time to the advertised content. This phenomenon has been widely studied by diverse authors in relation to various media. For instance, evasive behavior towards TV advertisement goes by many names such as: zipping, zapping, flipping, flicking and grazing (Abernethy 1991; Bellamy and Walker 1996; Cronin and Menelly 1992; Zufryden et al. 1993).

The consumer's evasion of ads can be examined from the following perspectives or dimensions (Duff and Faber 2008): cognitive, in which the user decides to

ignore the ad that is being presented; affective, in which the user develops negative emotions towards the ad, making its processing more difficult; and behavioral, in which the evasion materializes in behaviors like changing the channel, leaving the room or closing the ad (Heeter and Greenberg 1985; Speck and Elliott 1997).

With respect to the main precursors of evasion, the perception of advertising clutter is believed to drive cognitive and physical evasion of the ad (Burke and Srull 1988). Cronin and Menelly (1992) point out some evidence suggesting that advertisement evasion occurs as a result of attitudes towards advertising in general. In other words, since the consumers who avoid ads do not solely do it because of the ads' content, but rather because they perceive ads as intrusive, they tend to avoid all types of advertising messages. Thus, advertising avoidance happens when consumers perceive ads as intrusive (Cronin and Menelly 1992). Specifically, when consumers get the sense that an ad is hindering them from achieving their goals or tasks in the medium where the ad appears, they consider the ad to be an obstacle; this is a significant predictor of advertising evasion in any type of medium (Speck and Elliott 1997).

4.2 Online Advertising Avoidance

On the Internet, advertising avoidance occurs in a different way than it does in other traditional media, for various reasons. Internet use is characterized by the possibility of doing tasks quickly, thanks to the speed of access to data. Internet users have the capacity to interact and control what they are viewing. Thus, the negative attitude that consumers have towards Internet ads resides, fundamentally, in the perception held about online advertising. In general, it is believed that online advertising decreases the rate of access to data, delaying the completion of tasks. Interruption of the navigation activity could give rise to a negative response towards the ad, in the form of avoidance (Edward et al. 2002). Hence, perceived intrusion is considered a precursor both directly and negatively related with online advertising avoidance (Morimoto and Macias 2009).

Cho and Cheon (2004) performed various experiments to arrive at a detailed explanation as to why people avoid online advertisement. They calculated the roles of three variables that are very important at the moment of eluding this type of advertising format: the users' belief that online advertising is an impediment to achieving navigation goals; their perception that the quantity of ads on the Internet is overwhelming; and their previous negative experiences. They also analyzed the affective, cognitive and behavioral factors that cause users to avoid online ads. They concluded that one of the main causes of advertising avoidance comes from a user's belief that the Internet is more a tool for completing tasks than it is a medium for entertainment. This makes users avoid ads more willfully, especially when they have a time limit to complete their task.

Analysis of advertising avoidance across diverse advertising formats on the Internet has been done with an emphasis on the banner format. It has been noted

that cognitive avoidance is produced unconsciously when consumers avoid focusing the ad in their visual field. Benway (1998, 1999) calls this phenomenon banner blindness; this author suggests that consumers' vision unconsciously adapts to avoid online ads. Thus, cognitive avoidance is considered an automatic process; this includes visual stimuli incorporated in the ad and does not require a conscious behavioral decision or action by the consumer. Some authors propose that the cognitive dimension is the most important dimension of the online advertising avoidance phenomenon (see Li and Meeds 2007). On the other hand, behavioral or mechanical avoidance comes from the consumer's conscious decision to, for example, avoid the ad, close the ad or leave the website (Cho and Cheon 2004; Chatterjee 2007; Duff and Faber 2008).

5 Concluding Remarks

Analysis of the literature reveals that an advertisement's efficacy can be reduced by the presence of certain perceptions, attitudes and behaviors on the part of the consumers. This loss of efficacy has been studied in relation to both conventional mass media and the Internet. Awareness of the deciding factors of advertising effectiveness, and how to manage them, is of growing importance because of companies' large investment in online advertising in recent years.

Advertising clutter is a unique phenomenon that strongly impacts the effectiveness of companies' online advertising campaigns. It is measured by the degree of advertising pressure put on consumers in a particular medium. Considering the diverse compounding dimensions of advertising clutter, the dimension intrusiveness stands out; i.e., the perception that the ad is invading a space where it does not belong, which causes irritation in the consumer. It is this irritation along with the perceived loss of control the consumer experiences over which of the medium's content they are viewing that can drive them to advertising avoidance.

The most recent studies that have analyzed perceived intrusiveness within the context of websites have found various circumstances under which it is much more likely that an ad will be perceived as intrusive; e.g., poor execution of the ads, presence of too many ads in general, or pop-ups in particular (see Smith 2011). Advertising avoidance is one of the most significant defense mechanisms used to cope with the disturbing perception of clutter in a specific website. This phenomenon is studied through three perspectives or dimensions (cognitive, affective and behavioral), although cognitive avoidance stands out in Web-based environments. We must be aware of the fact that there exist ad formats in conventional websites that can be blocked automatically by the Internet browser, without the consumer realizing it, thanks to pop-up killers or banner killers, among others. Under these circumstances, advertising avoidance by the consumers does not take place. However, the proliferation and consumption of multimedia content (e.g., video, audio) complicate the automatic elimination of ads in certain circumstances; in these cases, advertising avoidance's behavioral dimension plays a bigger role

than the cognitive and affective avoidance responses. If the consumer perceives an ad as intrusive but does not have means to close it, he or she will experience a perceived loss of control over the website being viewed, which will in turn lead to negative reactance (e.g., negative attitudes towards the website, message or brand). Finally, this will result in the ad losing efficacy and decreased intention on the consumer's part to purchase the advertised products.

In summation, the literature suggests that the information offered by the ad must be in line with the users reasons for using the medium. The uses and gratification theory proposes online advertising is more likely to be accepted when it is useful for the Internet user. Being useful reduces the probability that any kind of advertising avoidance will occur and produces desired effects on memory, attitudes and purchasing behavior. The case of entertaining and informative ads is especially relevant as it can also moderate the appearance of negative reactions towards the ad.

To avoid online users employing avoidance mechanisms, ads should not compromise consumers' navigational freedom or impede their tasks (Edward et al. 2002). If a loss of control is perceived, based on the psychological reactance theory (Brehm and Brehm 1981), the consumer will try to reestablish independence or control over the situation by means of advertising avoidance. This type of defensive response is not good for the advertised brands and the ad, ultimately, damages the advertising campaign.

6 Practical Implications and Research Opportunities

In concurrence with the theoretical advertising issues presented and discussed throughout the article, some useful recommendations for practitioners are briefly noted here:

- *Use of relevant campaigns based in the tastes and preferences of the users*. Having campaigns based in content marketing significantly increases engagement and involvement with the brand and with the ad. This engagement leads to better processing of the advertisements, which will positively affect memory and recognition. Consequently, users' attitudes will improve, reducing ad irritation and avoidance.
- *Use of contextual ads or ads based in the user's behavior*. Nowadays, thanks to the information about users' navigational habits, it is advantageous to take into account the interests and tastes of the users in order to offer them more relevant messages, thereby decreasing advertising avoidance.
- *Correctly executed, entertaining ads*. Having correctly executed, entertaining ads can be a decisive factor in terms of the ad's efficacy, causing better advertising memory.
- *Avoiding intrusive advertising formats*. Developing new, non-intrusive formats will prove to be crucial for gaining the consumers' acceptance. In this sense, the

Internet advertising's white papers offered by various organizations (Interactive Advertising Bureau, Nielsen Company, etc.) provide companies with useful information on how to avoid bothering users with their ads, as is often the case with pop-ups, pop-unders, etc.

- *Incorporation of mechanisms to close the ad*. For the ad to be considered less intrusive, it is necessary that users can freely close the ad. Hence, buttons that allow the window to be closed should be included. Specifically, in the case of video and audio based ads, the potential for perceived intrusiveness should be reduced by only obligating the consumer to watch or hear a brief fragment of the ad, then giving them the option to close the ad. This is enough time to inform the consumer about the ad's content without bothering them by making them view the entire ad if it is not of interest. If this tactic is followed, the user could resume their navigational objectives with only a minor interruption.

Finally, with regards to future research opportunities, it would be helpful to know which advertising formats generate lower perceptions of advertising clutter; this information should be pursued through experimental research. It would also be interesting to evaluate the effect of the ad formats that can be consciously and voluntarily avoided by the user. Additionally, studying the motivations for use of specific websites (e.g., companies' websites, retailers' websites, social networks, video-sharing websites, etc.) will help increase the understanding of which formats are most appropriate in each specific case.

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Part III.3
Key Business Processes, Areas and Activities: Human Resources

e-HRM: A Catalyst for Changing the HR Function?

Emma Parry

Abstract Past research has suggested that e-HRM may have benefits for organisations by allowing the HR function to be more efficient, improving service delivery and facilitating its transformation into a more strategic role. This chapter draws upon the results from a large-scale survey across 12 countries and also on 10 qualitative case studies in order to examine if, and how, organisations can realise these benefits of e-HRM. The results confirmed that that e-HRM is most commonly introduced in order to improve efficiency, service delivery and to allow HR to become more strategic. Efficiency and service delivery improvements were most commonly realised, but some evidence was also found that e-HRM may help HR to increase its value by becoming more strategic. This is due to the fact that HR staff had more time and information to support the organisation in achieving its business strategy. The results also demonstrated that the relationship between e-HRM and efficiency, effectiveness and strategic outcomes was not clear cut but rather was dependent on the careful planning and implementation of e-HRM, including the engagement of multiple stakeholders and the development of a number of skills in the HR team.

Keywords e-HRM · HR role · HR efficiency · HR effectiveness

1 Introduction

In recent years, much attention has been paid to the role of technology in managing people, both in academic and practitioner circles. The maturing of electronic human resource management (e-HRM) as a field of academic interest is evidenced by the production of several edited texts (e.g. Bondarouk et al. 2011) special issues

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Table 1 Proportion of organisations using e-HRM in eight countries

Country	Percentage of organisations
United Kingdom	91
Germany	92
Italy	84
Norway	98
Switzerland	90
USA	85
Australia	84
South Africa	84

Source Data taken from the Cranet survey 2009

of journals (e.g. Bondarouk and Ruel 2009) and conferences (for example the European Workshop on e-HRM, held bi-annually since 2006) focusing on this field. The practical use of technology for human resource management has increased dramatically. In fact, data showing the proportion of surveyed organisations using e-HRM across eight countries in 2009 showed that the majority of organisations were actually using some form of technology for managing people (see Table 1).

E-HRM has been defined as "the planning, implementation and application of information systems for both networking and supporting actors in their shared performing of HR activities" (Stroehmeier 2007) and also as "a way of implementing HR strategies, policies and practices in organisations through a conscious and directed support of and/or with the full use of web-technology-based channels" (Ruel et al. 2004, p. 281). Ruel et al. (2004) and other authors have taken care to distinguish between e-HRM and HR information systems (HRIS) in that HRIS is used basically by the HR department itself whereas e-HRM is used by a wider range of organisational stakeholders such as managers and employees and is concerned with changing the interactions between the HR function and these stakeholders "from a pure face to face relationship to a technology mediated one" (Martin and Reddington 2010, p.1554).

Not only has the use of e-HRM grown, the nature of both the technology and its applications has also developed from the use of one-way internet-based information sources such as portals providing HR information to the use of more interactive web 2.0 technologies, mobile technology (Martin and Reddington 2010) and even gaming applications. This has allowed the use of self-service technology whereby line managers and employees conduct HR activities themselves and social media applications in which potential job applicants and learners interact, at least partly, with a technological platform rather than an individual. Indeed, Florowski and Olivas-Lujan (2006) reflected on the transition to a technology centred approach to HR delivery where a large proportion of administrative or transactional HR activities are now delivered electronically. Thite and Kavanagh (2009) however, noted that the use of e-HRM was not limited only to transactional HR but could also be used for "traditional" HR activities such as

recruitment, selection, training, compensation and managing performance, for value-adding transformational activities or for managing HR across the whole employee life-cycle. Table two shows the proportion of organisations across 33 countries using e-HRM for various HR activities in 2009. Data from the same survey also showed that 48 % of surveyed organisations (in 33 countries) used manager self-service and 39 percent used employee self-service.

The goals for the introduction of e-HRM have been much discussed in the literature. Notably, Ruel et al. (2004) identified three main goals for e-HRM use, based upon the Lepak and Snell's (1998) three "pressures" of virtual HR. First, the need for an HR function to be cost efficient and save money; second, the improvement of the service that the HR function provides to its internal clients and third, increasing the strategic orientation of HRM. Ruel et al. also added a fourth goal based upon their case study research—the need to improve the global orientation of HR. The first three goals or objectives are mirrored by a number of scholars in the area of e-HRM (for example see Martin et al. 2008; Stroehmeier 2007; Hendrickson 2003).

Using the resource-based view (RBV) (Barney 1991), these objectives can be related to the achievement of competitive advantage for a firm. Barney (1991) and others have suggested that the valuable rare, inimitable and imperfectly substitutable resources, including human resources (Wright et al. 2001), within a firm are the main source of its competitive advantage. Specifically, the framework of Bowman and Ambrosini (2000), based on the RBV, divides human resources or labour into generic labour that conducts routine, codifiable and imitable tasks and differential labour that is a source of the uniqueness within forms that can lead to competitive advantage. We can relate these two types of labour to the above goals. Increased efficiency can be associated with the efficient management of generic labour and the goals of improved service delivery and a strategic orientation for the HR function can be related to differential labour (Parry 2011).

In order to realistically assess the impact and benefits of e-HRM for organisations, it is important to understand whether the above goals are actually being realised. More importantly, it is essential to develop an understanding of the factors that might affect the realisation of the benefits of e-HRM so that organisations can maximise these benefits and therefore potentially improve their competitive advantage. This chapter will therefore seek to examine whether the three goals of increased efficiency, improved service delivery and a more strategic role for the HR function are being achieved through an examination of two sources of data on the outcomes of e-HRM. Therefore we will focus on data and analyses taken from two previously published studies—Parry and Tyson (2011) and Parry (2011). The use of the qualitative and quantitative data from both of these studies will allow us to examine the impact of e-HRM on efficiency, effectiveness and the strategic orientation of the HR function in some detail. Therefore, while this chapter relies on existing data, the combination of these two studies will allow us to provide new insights into the outcomes of e-HRM for the HR function. We will therefore aim to answer three questions (directly related to each of the three objectives of e-HRM) in turn:

1. What is the impact of e-HRM on the efficiency of HR processes?
2. What is the impact of e-HRM on the effectiveness of the HR function (the service that it delivers to its internal customers)?; and finally
3. What is the impact of e-HRM on the strategic orientation of the HR function?

We will proceed by discussing the methodology used for the two pieces of research on which it will be based. Following this, each of the three potential outcomes (goals) for e-HRM will be discussed in turn through an analysis of the past literature in each area and an examination of the data from the aforementioned studies. Finally the conclusions and implications of these two studies as a whole will be discussed.

2 Approach

As discussed above, this chapter is based upon data collected as part of two previously published studies (Parry 2011; Parry and Tyson 2011). One of these studies utilised purely quantitative survey data (Parry 2011) while the other relied on qualitative case study information (Parry and Tyson 2011). The combination of these two sources therefore will allow us to take a mixed methods approach to addressing our questions and to provide some detail behind the relationships established through analysis of the survey data. The methodology used in these two studies will be explained in full below.

2.1 Quantitative Study

This study drew on cross-sectional data from the Cranet survey of human resource management (for full details see Parry et al. 2011). Data were used from 12 countries (the UK, USA, Australia, Canada, New Zealand, Germany, Switzerland, The Netherlands, Belgium, Norway, Finland and Austria), that were chosen because they had seen an increase in the use of e-HRM. The Cranet survey examined the actual HR policies and practices used by organisations, therefore the unit of analysis was the organisation. Initially developed in 1989, the items within the questionnaire as a whole were based upon a review of the literature on HRM practices and discussions within a Network of academic experts on HRM. Since this time, the survey has been repeated on several occasions and the questionnaire updated on each occasion based upon developments in the academic literature and in practice. In each iteration, the Network included representatives from academic institutions in each of the countries from which data were to be collected. The questionnaire was first developed in English, translated into the language of each country by a local HRM expert and then translated back into English by a different HRM expert in each country to ensure that the meaning of each question remained

Table 2 Activities e-HRM used for (%)

HR activity	Percentage of organisations
Personnel records	83
Payroll	93
Attendance	79
Recruitment and selection	42
Training and development	52
Performance management	40
Career development	20
Work scheduling	40
Health and safety	26
Measurement of HR performance	25
Providing HR information	42

Source Data taken from Cranet survey 2009

the same. Full details of this process can be found in Brewster et al. (1994). For the purpose of this study, the following variables were created:

1. e-HRM use: Respondents were asked to indicate whether they used e-HRM for a particular activity (see Table 2 above for a list of activities) by ticking yes or no. The responses to these variables were summed to create a single variable with 9 meaning high e-HRM use and 0 meaning no use of e-HRM.
2. e-HRM sophistication: Respondents were asked to indicate how sophisticated their use of e-HRM was on a scale relating to the complexity of the system from 0, meaning no use of e-HRM through 1 for simple one-way communication to 5 for a very complex system.

The relationship between e-HRM use and sophistication and a number of variables was examined. These variables were: ratio of HR practitioners to employees, strategic involvement of HR, HR manager experience, devolution of HR activities to line managers and HR outsourcing.

Each participating Network member was responsible for developing a mailing list of organisational addresses and personal contacts in their country. These were generally commercial or governmental databases or databases from professional associations. The survey was sent to all of the organisations on the developed list. In accordance with Arthur and Boyles (2007) and Kumar, Stern and Anderson (1993), we used key informants to examine HRM at the organisational level. The respondent was therefore the highest-ranking manager in charge of HRM. The questions were designed to request only factual information about HRM within the organisation and respondents were advised to leave blank any questions for which they did not know the answer.

Potential respondents were contacted by letter or email and sent a copy of the questionnaire. They were later sent a reminder to encourage them to complete the questionnaire. The response rates for each country were between 20 and 35 %. Analyses of previous Cranet surveys have suggested that the responses are

representative of each country (see Brewster et al. 1994). Only private firms were used in this analysis. In order to examine the relationship between these predictors and the outcomes of e-HRM use and sophistication two least squares regression analyses were conducted (see Parry 2011 for the full details and results of these analyses). For the purpose of this chapter only a summary of the results of these analyses will be provided.

2.2 Qualitative Study

The second piece of research to be discussed in this chapter is based on ten case studies of organisations that had been using e-HRM for a year or more at the time of research. While it was not possible to be fully representative using ten case studies, organisations from a range of industries and from the public, private and not for profit sectors were included in order to elicit a variety of potential responses and to provide a detailed examination of the relevant issues. The organisations were visited between June 2006 and January 2007 so that interviews with a range of stakeholders could be undertaken. These individuals included HR practitioners, managers and employees. The number of interviews in each organisation was dictated by the nature of the organisation and its use of e-HRM. In two organisations focus groups with employees were conducted rather than individual interviews for convenience. Related documentation was also collected where this was appropriate to the case. The case study organisations were: BOC, British Sky Broadcasting (BSkyB), Cancer Research UK, the Crown Prosecution Service (CPS), IBM, Marks and Spencer, the National Health Service (NHS), Nortel, Norwich Union and Transport for London (TfL).

An interview protocol was developed as a result of a review of the relevant literature and discussions within the research team. This examined the goals for e-HRM use, implementation of the system and the impact of e-HRM within the organisation. For the purpose of this chapter only the information pertaining to the impact of e-HRM will be used. Detailed notes of the interviews were taken and checked with the participants for accuracy. Data were analysed in order to first identify outcomes of e-HRM relating to the three areas of efficiency, effectiveness (quality of service delivery) and the strategic orientation of the HR function and then to identify emergent themes within these areas. Full details of this study are available in Parry and Tyson (2011) and also in Parry et al. (2007).

3 Impact of e-HRM on the Efficiency of HRM

The idea that using e-HRM can improve the efficiency and increase the speed of HR processes as well as reducing costs has been much discussed in the literature. In fact, the “operational” (Lepak and Snell 1998) or “transactional” (Martin et al. 2008)

impact of e-HRM on HR processes appears to be widely accepted by most scholars (Lepak and Snell 1998; Enshur et al. 2002; Hendrickson 2003; Martin et al. 2008; Marler 2009). In fact, it could be suggested that efficiency gains are the most common objective for the introduction of e-HRM within organisations (Ruel et al. 2004). For example, Hendrickson (2003) suggested that e-HRM would have an operational impact by "allowing more transactions to occur with fewer fixed responses" (p. 383). In terms of the RBV, this may provide a means by which organisations can more efficiently manage generic labour in line with the RBV (Parry 2011).

Despite the expense involved in introducing e-HRM systems, this technology has ultimately been associated with a reduction in the costs of performing HRM activities. This is generally seen as the result of a reduction in HR headcount. Indeed, e-HRM may provide the means by which transactional or administrative HR tasks can be performed automatically therefore reducing the need for HR employees to perform these activities manually. In addition, the use of employee and manager self-service functionality allows the devolution of many basic HR tasks onto employees and line managers, again reducing the need for large numbers of HR practitioners. We may therefore expect that a higher use of e-HRM within an organisation would be associated with a lower headcount within the HR function. However, our analysis of quantitative survey data failed to find a significant relationship between e-HRM use or sophistication and the ratio of HR practitioners to employees within an organisation (HR headcount). On initial examination this seems surprising but an analysis of the qualitative data from our second study might provide some insights into why this is the case. On the basis of the quantitative data alone therefore, we do not find increased efficiency (with regard to HR headcount).

Of the ten case studies included in this research, nine reported that they had experienced cost or efficiency savings as a result of introducing e-HRM. These savings included the reduction of HR headcount by some of these organisations. Specifically, interviewees suggested that the automation of processes and direct entry of HR information by managers (rather than by a HR administrator) had not only increased the speed of HR transactions but had also reduced the need for so many HR staff to be available. For example, interviewees in TfL suggested that they had achieved savings of over £8million per year through reduced employee costs and the reduced use of recruitment providers. Interviewees in Norwich Union explained that they had reduced headcount within the HR department by 4.0 full time equivalents as well as saving money through the reduction of paper-based processes. IBM, Cancer Research UK and BOC also stated that they had reduced HR headcount as a result of automating HR processes.

This is in direct conflict with the quantitative survey results that suggested that there was no relationship between e-HRM and HR headcount. However, the qualitative study does also provide some insights into why it is that a reduction in headcount might not be achieved as a result of the introduction of e-HRM. The successful use of e-HRM and resulting efficiency gains are dependent on a number of conditions. First, that the e-HRM system is designed in such a way that

promotes usability and lends itself to the easy achievement of efficiency gains. Certainly in one case study organisation, BOC, the system was seem as not being user friendly or intuitive to use as well as being "slow and tedious" according to one interviewee. This meant that interviewees were finding it difficult to use the system and, in the case of BOC, one interviewee actually suggested that this was increasing the amount of administration needed rather than reducing it. Efficiency gains may also fail to be realised where potential users are either not familiar with the technology or where they are not engaged with the introduction of the new system. In IBM, a number of interviewees suggested that the use of e-HRM was readily accepted and successful because of the already high level of technology use within the organisation. Within other organisations, such as BOC and Norwich Union, there had been difficulties in encouraging managers and employees to buy-into the introduction of new technology and to actually use the system. This meant that in some cases existing, paper-based or manual processes were still being used in parallel with the e-HRM system, meaning that the efficiency gains were not being achieved. Within BSkyB, a number of initiatives had been taken to ensure that potential users were engaged with the system—this included staff briefings, articles in newsletters and on the intranet and comprehensive employee and manager training. The importance of employee engagement with a new technological system is supported by more general research into technology implementation and acceptance (Davis 1989).

Reductions in HR headcount will only be achieved if those individuals who would otherwise be employed in undertaking the transactional or administrative HR tasks performed by the e-HRM technology are removed from the organisation. It might be that these people are actually redeployed into other roles rather than being made redundant and therefore that reductions in headcount are not achieved regardless of the fact that other efficiency gains such as a reduction in the use of paper and increases in the speed of HR processes are observed. With reference to the RBV this idea is related to the concept of removing unproductive labour and replacing it with differential labour (Bowman and Ambrosini 2000). Indeed, Burbach and Dundon (2005) suggested that the introduction of e-HRM often meant that HR practitioners were redeployed into technology related roles. The evidence for efficiency gains provided by these two studies is therefore mixed. However, the qualitative data suggest that this might be because the impact of e-HRM on efficiency is more nuanced than one that can be unearthed by a simple quantitative analysis. It should also be noted that, in most of the case studies, the impact of e-HRM on efficiency and costs had not actually been measured objectively. This meant that it was difficult to establish what the effects of the introduction of e-HRM on efficiency were. One of the benefits of e-HRM is that measurements of HR process efficiency can be built into the design of the system. Therefore other organisations should consider the need to assess the efficiency gains resulting from e-HRM technology as part of the design process.

4 Impact of e-HRM on the Quality of HR Service Delivery (Effectiveness)

A second impact of e-HRM often discussed in the literature, is the idea that the use of e-HRM can help the HR function to provide a better level of service to its internal customers, namely managers and employees (Hendrickson 2003; Ruel et al. 2006). Past research has provided some evidence for a positive impact of e-HRM on HR service delivery through the simplification of processes or more accurate data entry (Gardner et al. 2003). More generally Bondarouk et al. (2009) found that e-HRM use was related to positive perceptions of HR effectiveness by line managers and employees.

Our qualitative case study research discovered some evidence that improvements to HR service delivery were being realised. Indeed, seven of the ten case study organisations suggested that such improvements had occurred as a result of the introduction of e-HRM. These improvements were commonly in the form of the increased accuracy of the data entered into HR systems due to the removal of the need for duplicate information keying. In addition, users were allowed easier access to training or HR materials contained in HR systems and there was also more readily available information for management decision making. The quote below from a manager at Cancer Research UK, with regard to their recently introduced e-recruitment system, provides a good illustration of these improvements.

> Previously we would submit paper forms that would be passed from person to person. These would get lost and then we would get accused of never submitting the form in the first place. The new system means that we can find where an action is in the process at any one time

It is worth noting however that it was suggested by interviewees from two of our case study organisations, BOC and IBM, that the introduction of e-HRM could actually have a negative impact on the standard of the service offered by the HR function in that it depersonalised this provision.

Lepak and Snell (1998) discussed effects of e-HRM associated with service delivery such as the ability to provide managers and employees with remote access to HR information and therefore increase their ability to connect to other parts of the organisation and to other organisations, enabling them to perform many HR activities themselves. Lepak and Snell call these "relational effects". This suggests an indirect positive impact on service delivery in empowering line managers and employees to perform HR tasks themselves. Indeed, Bondarouk et al. (2009) suggested that, in organisations where HR practitioners have used e-HRM to delegate their administrative HR tasks to line managers and employees, we might expect that the main goal of the introduction of e-HRM would be to improve the perceived effectiveness of HR to a range of stakeholders. This idea is related to the more general discussion of strategic HRM that includes the devolution of HR activities to managers as an important characteristic (Whittaker and Marchington 2003; Larsen and Brewster 2003). This might lead us to expect that a high level of

e-HRM within an organisation would be related to the devolution of HR tasks to line managers.

We investigated this suggestion as part of our quantitative study. Surprisingly, the results showed a significant but negative relationship between e-HRM sophistication and the devolution of HR tasks to the line, an association that was therefore in the opposite direction to that expected. The relationship between e-HRM use and devolution of HR tasks to line managers was also negative but not significant. Rather than e-HRM leading to the empowerment of line managers to perform HR tasks themselves, as suggested by Lepak and Snell (1998) this suggests that organisations are using e-HRM as an alternative to devolving HR activities to the line. This is despite the fact that the more sophisticated e-HRM systems commonly included manager self-service capability.

The qualitative case studies also failed to provide strong evidence for the empowerment of managers to perform HR duties. Six of our ten case study organisations stated that the development of management capability to perform HR tasks was an objective for their introduction of e-HRM. For example, BSkyB suggest that they wanted to:

> Improve customer satisfaction for different segments of customers so that line managers can do things quicker and more easily and also to respond to the needs of the business by enabling sickness absence to be managed more easily.

Cancer Research UK suggested that they wanted to improve the credibility of the HR function through the use of e-HRM:

> Previously there were no reports to drive decision-making so management decisions were not based on reliable and accurate information. HR was seen as responsible for producing this information but didn't have the tools to provide it. The information needs to be accessible and self-service means that it is.

However, only three of the organisations provided any evidence that this goal was being realised. These organisations were BSkyB and Nortel in which managers has been given increased HR responsibility and, due in part to the provision of online tools to assist and support them with these duties, had become proficient in conducting these activities. More specifically, in IBM, a range of HR information had been supplied over the intranet and this had led to a higher level of HR knowledge in both managers and employees.

The evidence for the impact of e-HRM on service delivery or HR effectiveness is therefore also mixed. Again, this might be to some extent dependent on the usability of the technological tools themselves (particularly in the case of manager and employee self-service tools) and on the level to which managers and employees had bought into the use of such technology. In this case, the empowerment of managers to conduct a higher level of HR tasks is also dependent on their willingness to take on this responsibility. Indeed, within Norwich Union, a number of the managers interviewed showed some resentment at the expectation that they should be undertaking "the HR departments work". It is also important to recognise that the improved effectiveness of the HR team depends on the skill

levels and experience of the team. In the case of Cancer Research UK, we saw some evidence of improved service delivery through HR practitioners spending time working with managers on more value-added tasks such as supporting recruitment decision-making. However, it was also recognised within this organisation that this had required the HR team to develop new skills such as consultancy. Indeed, authors such as Zhang and Wang (2006) have commented that a lack of competent HR staff might impede the realisation of the benefits of e-HRM.

5 Impact of e-HRM on the Strategic Orientation of the HR Function

The third area in which e-HRM has been said to have a potential impact on the HR function, and probably the one that has attracted the most debate, is that of a potential effect on the role of the HR function. A number of authors, including Ruel et al. (2004) have suggested that e-HRM has the potential to transform the HR function into one that is more strategic, whereby "strategic" refers to an involvement in the strategic management of the business (Wright and McMahan 1992). The HR function would therefore become one which spends less time focusing on transactional or administrative activities and more time focusing on activities that are central to the organisation's strategy (Lawler and Mohrman 2003; Hendrickson 2003; Shrivastiva and Shaw 2004; Ruel et al. 2006). This "transformational" (Lepak and Snell 1998) impact of e-HRM has been much discussed in the literature with considerable disagreement existing between authors about whether the use of e-HRM can really facilitate the transition to an HR function playing the strategic role of "business partner". On one side of this debate, a number of authors have concluded that e-HRM can indeed help the HR function to play a more strategic role. For example, Ruel et al. (2004) and Olivas-Lujan et al. (2007) found a link between the use of e-HRM and the integration of the HR function with the firm strategy.

On the other hand, Tansley et al. (2001) concluded that e-HRM had not yet realised its potential to facilitate a more strategic role for HR. Burbach and Dundon (2005) suggested that the focus of e-HRM was most commonly on administrative activities rather than on strategic decision making and Gardner et al. (2003) suggested that the use of e-HRM simply meant that administrative tasks were replaced with technological rather than strategic activities. Marler (2009) suggested that the impact of e-HRM on the role of the HR function was actually dependent on the nature of that function with administratively oriented HR departments being more likely to have efficiency related goals for e-HRM. Alternatively, HR departments that already function strategically were more likely to have strategic goals for the use of e-HRM.

Our quantitative study investigated the relationship between the use and sophistication of e-HRM and an index created of variables often associated with

the strategic nature of the HR function. These variables included whether the HR Director had a place on the Board of Directors or similar, whether the firm had an HR strategy and at what stage the HR department was involved in the development of business strategy. The results showed that the strategic nature of the HR function was positively related with e-HRM use but not e-HRM sophistication.

The literature suggests that such a relationship is due to two factors: first, the fact that the use of e-HRM can release HR practitioners from the need to undertake administrative or transactional tasks, therefore freeing up time for them to focus on more strategic activity; and second, that e-HRM technology can provide the HR function with access to detailed and accurate data about human resources that can be used as a basis for strategic decisions. Our qualitative case study data might provide some insight into whether these two processes are indeed facilitating the transition to a more strategic focus for the HR function.

Interviewees from seven of our ten case study organisations described effects of the introduction of e-HRM that could be related to an increase in strategic HR activity. In line with the literature, these changes were related to the increased availability of accurate and detailed HR information or to additional time available to the HR team as a result of e-HRM use. For example, the HR team within Cancer Research UK was able to produce a wide range of statistics relating to a variety of HR processes that were then used as a basis for HR and managerial decision making. Similarly, TfL had set up a group information management team who were responsible for producing data and identifying areas in which the business needed to improve efficiency. An interviewee from the CPS explained that the e-HRM system had been:

> Developed to provide strategic information on promotion rates, turnover rates and assist with modelling manpower systems for planning purposes. This will, for example, provide opportunities for exploring "what if" scenario planning when HR strategies are being developed.

Also in TfL, the HR function had used the introduction of e-HRM as a foundation for the restructuring of the HR department so that it included a HR shared services department. Interviewees within TfL reported that HR practitioners were spending 70 % of their time following the introduction of e-HRM on "strategy" as opposed to spending 70 % on administrative HR tasks prior to e-HRM introduction.

The data from both studies therefore provides some tentative evidence that the introduction of e-HRM might allow the HR function to have a greater involvement in the strategic activity of the firm rather than focusing purely on transactional and administrative tasks. In line with the RBV, the increased focus of the HR function on the delivery of the business strategy rather than transactional activities, moves the emphasis of the function from generic labour to differential labour, meaning that it may increase its use value to the organisation and be able to provide a more significant contribution to the competitive advantage of the firm.

However, it should be noted that this evidence is mainly anecdotal and may not actually reflect an increased involvement in the development or implementation of business strategy. It is also interesting to note that in four of the seven case study

organisations that reported an increase in strategic activity as a result of introducing e-HRM, this impact was unintended. In one of four organisations that had a stated goal for e-HRM of facilitating a more strategic role, this objective had not been realised. This suggests that the move to a strategic role for the HR function as an outcome of e-HRM introduction might be somewhat hit and miss. Perhaps if this was considered more carefully in the development of such a system, so that the ability to produce strategy-related data was incorporated into the system design, this might be achieved more readily. In addition, the move of HR practitioners into more strategic roles is again dependent on the skills and experience of those individuals. In order to adopt a strategic role, HR practitioners need a very different set of skills to those needed to fulfil a transactional or administrative function. The HR function will need to develop skills such as data analysis, strategy formulation and project management in order to be able to truly play a business partner role.

6 Conclusions

This chapter has drawn on two previously published studies to provide further insight into the impact of e-HRM upon the HR function. Specifically, we have examined whether the introduction of e-HRM can act as a catalyst to produce a HR function that is more efficient, more effective and more strategic. The combination of a quantitative and a qualitative study has allowed us to look at both relationships between the use and sophistication of e-HRM and a number of potential outcomes related to efficiency, effectiveness and the strategic nature of HR and also to examine some of the mechanisms underneath those relationships.

The results really show that the evidence with regard to the impact of e-HRM on the HR function is mixed. While past literature and our qualitative data demonstrates positive impact of e-HRM upon the efficiency and speed of HR processes and the capacity of e-HRM to reduce HR costs, the latter of these is not born out in our quantitative analysis of the relationship between e-HRM and HR headcount. Indeed we have shown that there is no significant relationship between these two. This raises doubts about the role of e-HRM in the efficient management of generic labour. Qualitative data suggest that the impact of e-HRM on HR efficiency might actually be dependent on the design and implementation of the e-HRM system.

Our evidence regarding the relationship between e-HRM and HR service delivery is also mixed. While our qualitative results provide some indication that the introduction of e-HRM does allow HR practitioners to be more effective and to provide a better service to their internal customers, we did not find any evidence through our quantitative study of a relational impact of e-HRM in terms of empowering managers to conduct HR activities. Importantly, this relationship depends on the engagement of managers and employees with the e-HRM system as well as the usability of the technology itself.

Finally, we find some indication that the introduction of e-HRM might have the potential to facilitate a move of the HR function into a more strategic role. Our qualitative data show that the availability of both time and detailed data might allow HR practitioners to focus more on the development and implementation of business strategy rather than on administrative or transactional HR tasks. However, it is also clear that this transformation is reliant on the HR team developing the skills needed for them to play such a role.

This chapter has provided a simple introduction to the issues involved in achieving the desired impacts of e-HRM on the management of generic and differential labour. We have found that the use of e-HRM may help the HR function to increase differential labour and therefore increase its value by developing a more strategic orientation. This supports past literature on the use of e-HRM (Marler 2009; Martin et al. 2008; Ruel et al. 2004; Lepak and Snell 1998).

The mechanisms by which the use of e-HRM might result in improvements in efficiency and service delivery and by which the HR function might transition into a more strategic role, remain unclear. Therefore more research is needed. First, future research could examine the actual impact of e-HRM on costs, speed of processes and HR headcount by making use of the metrics built into such technology. Longitudinal, or before and after, studies around the efficiency and effectiveness of HR practices and the impact of e-HRM on these are needed to examine exactly how these operational, relational and transformational effects might be obtained. A stakeholder approach to this kind of evaluation might be useful, in order to assess the impact of e-HRM technology on different groups of people such as HR practitioners, managers and employees. The comparison of the design and introduction of e-HRM with other technological advances in order to draw on what we know about the implementation of technology more broadly would also be useful. Finally detailed longitudinal studies of the role of the HR function and how this is transformed through the introduction of e-HRM are also needed.

Despite the need for further research, this research does have some clear implications for practitioners. It is clear that the espoused benefits of e-HRM introduction are not necessarily achieved easily by organisations. Specifically, a number of factors have been identified that have an impact on whether the objectives of e-HRM are realised.

With regard to efficiency and service delivery objectives, these may be in part dependent on the design and implementation of the e-HRM system itself and upon the thorough training of users of the system. This supports previous work on technology acceptance generally (Davis 1989). It is also essential that organisations take steps to obtain the "buy-in" of managers and employees when introducing an e-HRM system. The fact that fewer resources are required for e-HRM than to operate a manual HR system could allow the HR function to make a transition to a more strategic role. However, organisations need to ensure that the additional time available to HR practitioners is devoted to strategic activities rather than to improving service delivery. Both improved service delivery and the move to a more strategic role for HR might be constrained by the skill levels of the HR

team. Improving service delivery and adopting a different role require new areas of expertise such as technical, consultancy or project management skills. It is therefore essential that these skills should be developed in an organisation's HR team if the transformation into a more effective and more strategic HR function is to be achieved.

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Research Approaches in e-HRM: Categorisation and Analysis

Stefan Strohmeier

Abstract Electronic Human Resource Management (e-HRM) is a new interdisciplinary field of research at the intersection of Human Resources (HR) and Information Systems (IS). Research in e-HRM is currently based on diverse research approaches from HR and IS, its "parent disciplines", as well as other disciplines. The frequent implicitness and thus uncertainty of the used research approaches, however, is disadvantageous for future e-HRM research because it obstructs a conscious and instructed selection and adoption of research approaches as well as mutual understanding and cooperation between different research approaches. The current chapter thus aims to categorise (which approaches are available?) and analyse (which characteristics and potential do these approaches demonstrate?) e-HRM research approaches. To this end, a brief framework of conceptual criteria is derived that allows research approaches in e-HRM to be categorised and analysed. Based on this, a categorisation and analysis of four major approaches, i.e., critical research, interpretive research, post-positive research and design research, is offered, and the possibilities for adopting these approaches in e-HRM research are described.

Keywords e-HRM · e-HRM research · e-HRM methodology · e-HRM paradigms · Critical research · Interpretive research · (Post-) Positive research · Design research

1 Introduction: Research Approaches in e-HRM

Electronic Human Resource Management (e-HRM) can be understood as the planning, provision, implementation, operation and application of information technologies to both support and network human actors in their shared performance of human resource-related tasks (Strohmeier 2007). Corresponding with the

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broad and international practical adoption of e-HRM (e.g., Panayotopoulou and Galanaki 2010; Strohmeier and Kabst 2009) academic interest in e-HRM has also increased, as demonstrated in recent reviews of the field (Bondarouk et al. 2012; Strohmeier 2007). Due to its interdisciplinary nature, various disciplines engage in e-HRM research. The major research contributions stem from the two "parent disciplines", information systems (IS) and human resources (HR), although additional disciplines, such as software engineering, psychology, or law, are also involved. A research approach is understood as a reasonably consensual, though often sub- or semi-conscious set of interrelated ontological, epistemological, ethical and corresponding methodological assumptions that direct the research activities of a certain group of researchers within a certain period (e.g., Burrell and Morgan 1979; Kuhn 1976); e-HRM, however, lacks any endogenous research approach. Consequently, different approaches from the various involved disciplines are employed. However, across disciplines, these approaches are rarely mentioned or discussed in-depth. On the contrary, the fact that basic assumptions in research regularly remain semi- or even subconscious (e.g., Khazanchi and Munkvold 2007; Niehaves 2007) implies a common lack of awareness and therefore of reflection on own paradigmatic assumptions as well as on ultimately suitable paradigmatic alternatives for own research.

The implicitness and associated uncertainty of approaches is disadvantageous for future e-HRM research. It obstructs a fully conscious and well-instructed selection and adoption of research approaches, which should be preferred over research that is merely based on tacit assumptions and unquestioned orthodoxies. Additionally, it obstructs a mutual understanding and potential cooperation between different research approaches in e-HRM, which should be preferred over an unconnected coexistence or, worse, conflicts between different "schools of thought". To contribute to future e-HRM research, the current chapter thus aims to

- categorise (which approaches are available?), and
- analyse (which characteristics and potentials do these approaches show?)

suitable approaches for e-HRM research. To this end, a brief framework of criteria is first derived, which allows research approaches in e-HRM to be both categorised and analysed (Sect. 2). Based on this, a categorisation and analysis of four major approaches, i.e., critical research, interpretive research, post-positive research and design research, is offered (Sect. 3). Finally, the results are summarised and possibilities of adopting the approaches in e-HRM research are described (Sect. 4).

2 Framework: Criteria for Categorisation and Analysis

Any categorisation and analysis of research approaches in e-HRM requires a methodical approach. The taxonomical and typological approaches provide two basic methodical possibilities. The taxonomical approach aims to empirically

determine and describe real-typical categories based on attributes of existing research contributions. The typological approach is built on the conceptual development of ideal–typical categories based on conceptually derived meaningful criteria for categorisation and analysis (e.g., Bailey 1994). In roughly evaluating both approaches, the taxonomical approach has some obvious limitations for categorising and analysing e-HRM research approaches. First, the employed research approaches remain mostly implicit in current e-HRM research. Thus, the underlying tacit assumptions would have to be laboriously "re-constructed", e.g., based on the research methods employed in the respective contributions. Moreover, given the relative novelty of the e-HRM research field, it cannot be guaranteed that each basically useful research approach has already been employed in current e-HRM research. Consequently, valuable alternatives to existing research approaches could be overlooked by the taxonomical method. The typological approach is therefore used to categorise and analyse relevant e-HRM research approaches. To this end, it is necessary to derive a concise set of meaningful conceptual criteria that allows the respective approaches to be differentiated and depicted, which is done in the following, based on existing literature in the e-HRM parent disciplines.

Following a general consensus in the literature, basic ontological, epistemological and ethical assumptions form the foundation for basic methodological assumptions of any research approach (e.g., Anderson 2004; Chen and Hirschheim 2004; Cua and Garret 2009; Deetz 1996; Lee 1991; Khanzanchi and Munkvold 2007; Orlikowski and Baroudi 1991; Paucar-Caceres and Wright 2011). Understanding *ontology* as the basic theory of being (e.g., Iivari 2007; Carlsson 2010), *epistemology* as the basic theory of knowing (e.g., Iivari 2007; Orlikowski and Baroudi 1991), and *ethics* as the basic theory of human values (e.g., Dachler and Enderle 1989; Iivari 2007), the crucial importance of these domains for research, and thus for *methodology* as the basic theory of research (e.g., Bunge 1967a, b; Iivari 2007), is evident. Differences in research approaches are thus a direct result of the controversial ontological, epistemological, ethical and therefore methodological assumptions of researchers. As a minimal model of assumptions relevant for categorising and analysing research approaches, Fig. 1 offers major ontological, epistemological, ethical and methodological criteria along with major controversial positions regarding the respective criteria.

These criteria are thus used in the following as a framework for categorisation and analysis, although several related aspects have to be clarified. First, despite the fact that there is a certain consensus in literature relating to these criteria, additional and alternative criteria are at least imaginable. Depending on such criteria, this could influence and change the resulting categorisation. Moreover, the respective controversial positions on the individual criteria provide a very rough and condensed depiction. One example is that the epistemological positions of realism and constructivism both constitute broad umbrella terms for diverse epistemological detail positions. Additionally, different criteria are logically interrelated and an arbitrary combination of positions can be syncretistic and thus invalid. For instance, given the close relationship of ontology and epistemology,

ontology	existence of being	realism ⟷ constructivism	
		being comprises objectively given objects and attributes that exist as real empirical entities independent of human perception	"being" comprises merely subjectively constructed objects and attributes that only exist in and due to human perception
	regularities of being	determinism ⟷ indeterminism	
		there are invariant causal regularities of being that can be used to explain and predict phenomena	[in the social domain] there are no causal regularities to be used for the explanation and prediction of phenomena
epistemology	relation of knowing and being	realism ⟷ constructivism	
		there is the possibility of a – limited – correspondence of knowing and being ("correspondence theory of truth")	there is the possibility of a correspondence of human constructions with further constructions ("consensus theory of truth")
	source of knowing	rationalism ⟷ empiricism	
		human knowledge emerges from intellectual reasoning	human knowledge emerges from sensory experience
ethics	consideration of values	objectivism ⟷ normativism	
		research should be free of human values because these don't show a truth value	research is value-laden and thus should uncover own values and explicitly consider stakeholder values
methodology	validity of research	nomology ⟷ idiography	
		due to ontic regularities, generally valid ("law-like") statements are possible	due to ontic unitarism ("unique phenomena"), generally valid statements are not possible
	objectives of research	intellectualism ⟷ interventionism	
		research aims to generate "mere" knowledge that is not (primarily) oriented towards transforming practice	research aims at (generating knowledge that is directly oriented towards) transforming practice
	methods of research	quantitative ⟷ qualitative	
		research measures and analyses data numerically	research ascertains and interprets unquantifiable information

Fig. 1 Criteria for categorisation and analysis

ontological constructivism and epistemological realism clearly constitute mutually exclusive positions. Finally, not all criteria are equally relevant and important for each research approach. Usually, only a selection of some of these criteria are constitutive for the approach (*constitutive criteria*), whereas further criteria are

used to differing degrees for a supplementary clarification of the approach (*supplementary criteria*). Therefore, this bisection of constitutive and supplementary criteria has to be considered.

3 Categorisation and Analysis: A Quadrisection of Approaches

3.1 Categories of Research Approaches

Using the above criteria and the respective antagonistic positions towards them almost directly leads to an initial dichotomy of two antagonistic world views. The first view can be characterised by the assumptions of realism, determinism, objectivism, nomology and quantitative orientation, whereas the second view considers the opposing concepts of constructivism, indeterminism and qualitative orientation. This dichotomy of world views is mostly mapped by a very common bisection of research approaches into (*post-)positive research* and *interpretive research*, which can be frequently found in contributions in both parent disciplines, i.e., IS (e.g., Lee 1991; Niehaves 2007) and HR research (e.g., Anderson 2004; McKenna et al. 2008). Given that any categorisation should meet the (partially competing) requirements of offering a lucid and complete set of internally homogeneous and externally separable categories, this simple categorisation offers obvious advantages. Because it comprises only two antagonistic approaches, the categorisation is undoubtedly lucid. Additionally, given that this categorisation directly maps the controversial assumptions of many of the above criteria, both categories are also clearly separable. However, both categories lack complete internal homogeneity because there are different strands of interpretive research (e.g., Klein and Myers 1999; McKenna et al. 2008) and at least two different strands of (post-) positive research (e.g., Goles and Hirschheim 2000; Myers and Klein 2011). Moreover, whether this categorisation is complete is questionable because additional research approaches are discussed.

Further categorisations thus include *critical research* as a third category—thereby offering a trisection of approaches. This categorisation can again be found in both HR (e.g., McKenna et al. 2011) and IS research (e.g., Cecez-Kecmanovic, 2011; Orlikowski and Baroudi 1991). This consideration of an additional research approach doubtlessly adds to the completeness of the categorisation. However, given certain similarities of critical and interpretive research (e.g., Cecez-Kekmanovic, Cecez-Kecmanovic 2011), there might be a certain loss of separability of the approaches. A major similarity refers to the criterion of research methods, given that the critical approach lacks endogenous methods and, thus, frequently relies on interpretive methods (e.g., Cecez-Kecmanovic 2011). However, because there are still sufficient differences, e.g., referring to research objectives or the consideration of values, the inclusion of critical research seems to

be adequate in improving the completeness of the categorisation. However, this trisection again lacks internal homogeneity, given that critical research is also not homogeneous but constitutes an umbrella term for differing views (e.g., Alvesson 2009; Cecez-Kekmanovic 2011).

In terms of newer developments, *design research* is a fourth category that is frequently discussed. Design research is broadly considered, particularly in recent IS research (e.g., Hevner et al. 2004; Hevner and Chatterjee 2010), also there are few related contributions in management research (e.g., van Aken 2004 and 2005). Design research is frequently offered as an alternative approach to post-positive research (e.g., Hevner et al. 2004; van Aken 2004). Again, design research shows certain similarities to post-positive research but also clear and innovative differences, which classifies design research as a *sui generis* approach. Having a quadripartite categorisation again contributes to completeness, although design research also shows a certain internal heterogeneity (e.g.,Winter 2008; Hevner and Chatterjee 2010).

Infrequently, additional approaches, such as post-modern or feminist research, among others, are mentioned in the literature (e.g., Deetz 1996; Paucar-Caceres and Wright 2011). As with critical and design research, the additional consideration of these approaches would clearly contribute to the completeness of the categorisation. However, because these approaches are also seen as sub-categories of one of the four considered approaches, this would detract from separability and lucidity of the categorisation. The above quadrisection of *critical*, *interpretive*, *post-positive* and *design research* is thus employed in the following as a compromise that balances the competing categorisation requirements of lucidity, completeness, homogeneity and separability; however, it is explicitly admitted that, based on the above criteria, other categorisations are both imaginable and available.

3.2 Critical Research Approach

3.2.1 Description of Critical Research

The critical research approach (also "critical theory", "critical social research") is practiced in both e-HRM parent disciplines, HR and IS (e.g., Cecez-Kekmanovic 2011; Watson 2004). However, in the context of e-HRM, critical research constitutes a niche rather than a mainstream approach, and very few e-HRM studies thus far can be classified as "critical". As previously mentioned, critical research cannot be understood as a singular uniform approach, but instead constitutes a broad umbrella term for differing conceptions (e.g., Alvesson 2009; Cecez-Kekmanovic 2011). However, there are common constitutive characteristics that particularly refer to assumptions on the regularities of being, the objectives of research and the consideration of values.

As major *regularity of being,* critical research assumes the existence of dialectical contradictions as a basis of ongoing change. Referring to the human

domain, it is assumed that social order is produced and reproduced by humans; however, given diverging interests, certain varieties of power and domination emerge that may also be covert and subconscious. Such contradictions regularly lead to inequality and conflicts, from which new forms of social order emerge. These might again generate inequality and conflicts that could once again lead to change. In this way, humans can be dominated by social structures but they are not entirely determined because existing social structures can be changed (e.g., Alvesson 2009; Orlikowski and Baroudi 1991). Therefore, a mediating position between determinism and indeterminism is adopted. The notorious tensions between "labour and capital" constitute a major assumed contradiction in private corporations. This makes the domination and control of employees a major guiding topic of critical research in HR (e.g., Watson 2004) as in IS (e.g., Myers and Klein 2011).

Based on this, *objectives for research* are derived and the emancipation from oppressive structures can be delineated as the overall objective (e.g., Alvesson 2009; Cecez-Kekmanovic 2011). In reference to this, resolute positions indicate a direct responsibility of research for the emancipation of practice, whereas moderate positions observe an indirect responsibility of research, which should offer information related to how practice can independently emancipate itself (e.g., Orlikowski and Baroudi 1991). Research is therefore aimed at criticising and changing existing structures of domination and control instead of legitimising and reinforcing them (e.g., Cecez-Kekmanovic 2005; Watson 2004). A distinct interventionist position is therefore adopted. This basic objective of emancipation can be operationalised through three sub-objectives: insight, critique and transformation (Alvesson and Deetz 2000). Insight is focused on practical knowledge as it pertains to real situations, critique refers to deeper analysis that uncovers hidden interests and oppression, and transformation refers to the formulation of alternatives and the stimulation of change (Alvesson and Deetz 2000). Critique therefore constitutes the basic attitude of the approach, consequently naming it.

Moreover, the *consideration of values* constitutes a third interrelated characteristic of critical research. It is basically assumed that the social domain is "value-laden" by nature (e.g., Cecez-Kekmanovic 2011; Myers and Klein 2011). As a consequence, values are considered in a twofold manner: First, the values—or perhaps more concrete interests—of different domain stakeholders are crucial for understanding and uncovering their respective dialectic structures and must thus be considered in critical research (e.g., Alvesson 2009; Cecez-Kekmanovic 2005). Obviously, this contributes to the "politicisation" of research (Alvesson 2009; Watson 2004). Second, critical researchers take an explicit own value position. This is necessary to support a normative argumentation and a moral assessment of the criticised existing social structures as well as the newly suggested ones. It is emphasised that such value positions—related to, for instance, human freedom, social justice, or democratic decisions—have to be critically reflected on and substantiated (e.g., Cecez-Kekmanovic 2011; Myers and Klein 2011). This twofold explicit consideration of values clearly indicates that critical research is a distinct normativist approach.

Beyond these constitutive characteristics, all further criteria constitute supplementary characteristics that additionally describe the approach, although often in a heterogeneous manner. Starting with assumptions on the *existing of being*, explicit specifications are rare and hint at a constructivist understanding because social structures are depicted as "constructed" (Alvesson 2009; Paucar-Caceres and Wright 2011). This is, however, an equivocal statement given that social structures are of course—also in a realist perspective—man-made and thus "constructed". Moreover, the *source of knowing* is also rarely concretised. The fact that a great amount of past critical research refrains from any empirical work (e.g., Alvesson and Deetz 2000) seems to hint at rationalism; however, the concurrent (partial) turn towards empirical critical research (e.g., Cecez-Kekmanovic 2011) indicates a combined position. Similarly, the assumptions on the *relation of knowing and being* are also rarely and heterogeneously addressed. For example, there are constructivist positions (Alvesson 2009) and syncretistic "hybrid" positions between realism and constructivism (Orlikowski and Baroudi 1991). Existing statements on the *validity of research* also turn out to be heterogeneous. Newer positions abdicate from pure idiographic positions and aim at least at limited generalisations that "identify patterns, structures, and mechanisms underlying social and technological phenomena across cases but *not* to find universally valid laws" (Cecez-Kekmanovic 2011, p. 450; accentuation by the author). This demonstrates that critical research beyond emancipation additionally aims to explain and predict phenomena, although this requires a deeper specification. With respect to suitable *research methods,* it was already mentioned that conventional critical research was rationalistic (Cecez-Kekmanovic 2011). When turning (also) to empirical research, there consequently was a lack of endogenous "critical" methods, which was also criticised as a deficiency of the approach (Cecez-Kekmanovic 2005). In the interim, critical research adopts and adapts empirical methods from interpretivism, and (critical) hermeneutics, (critical) ethnography, or (critical) discourse analysis are discussed (Cecez-Kekmanovic 2011). It yet has to be emphasised that critical research also considers the choice of methods as "political" and emphasises the need for a contextualistic and reflected choice of suitable methods (Cecez-Kekmanovic 2005).

3.2.2 Example of Critical Research

To more deeply illustrate the approach, an ideal–typical critical e-HRM study is depicted in the following (Searle 2006). The topic of the study refers to potential problems with privacy and equity caused by IS in recruiting (Searle 2006, p. 336). This topic already hints at a "critical" study given that the concerns of stakeholder groups, which are assumed to be underprivileged, are examined. Although not explicitly substantiated in the paper, protection of privacy and equality of treatment constitute the major values guiding the study. The critical orientation subsequently pointedly manifests itself in the foundation of the study, which does not refer to an explicit theory but to the concept of surveillance, as a well established

core concept of critical research. This concept is used as a perspective to uncover potential hidden threats to privacy and equality (Searle 2006, pp. 337–338). The existence of surveillance is thereby taken for granted because the paper does not investigate *if*, but *how* electronic surveillance is practiced in recruiting. The study employs a literature review that compares conventional and electronic recruiting procedures and, and based on this, leads to a derivation of potential for misuse (Searle 2006, pp. 339–346). A general method is therefore used, which is not endogenous to the critical approach but is employed in a clearly critical way—thereby corresponding to the methodological discussion above. The results of the paper refer to various potential (not actual) avenues of misuse, such as the inability to control data privacy if ability testing is outsourced to external providers as a threat to privacy (Searle 2006, p. 343) or the lower participation of older and female applicants in e-recruiting as a threat to equality (Searle 2006, p. 342). In total, an anthology of the imaginable problems of electronic systems in recruiting is presented. In doing so, the paper also uses implicit generalisations, i.e., the respective problems are depicted as generally valid. The deep concerns and caveats of critical research relating to e-HRM might be best illustrated by the fact that e-recruiting is compared to Orwell's negative vision of a fictitious totalitarian, immoral and inhuman regime that misuses technology to establish total surveillance and control over the population (Orwell 1949; Searle 2006, p. 337). The paper concludes with a call for more critical research on the subject (Searle 2006, p. 347). Therefore, only two objectives of critical research, i.e., insight and critique, are addressed, whereas the third and crucial objective of transformation (Alvesson and Deetz 2000) is not considered.

3.2.3 Discussion of Critical Research

The critical research approach evidently offers *opportunities* for e-HRM research. A basic advantage lies in the general uncovering of e-HRM as a multiple stakeholder domain with clearly diverging interests. It exposes current mainstream research in e-HRM (Bondarouk and Furtmüller 2012; Strohmeier 2007) as an implicitly one-sided endeavour that is mostly interested in managerial questions of how to use information technology to improve HRM and thereby legitimises and reinforces existing corporate power structures (Nienhüser 2011). With the establishment of a multiple stakeholder perspective, critical research could therefore transform e-HRM research from an implicitly monistic endeavour to an explicitly pluralistic one. The resulting identification and alleviation of the downsides of e-HRM for negatively affected persons could contribute to a more politically balanced development and application of electronic HR systems. In the medium to long term, this might also contribute to the managerial success of e-HRM. The general sensitisation to and consideration of values might additionally also initiate the development of specific ethical guidelines for e-HRM. Given that increasing surveillance and control of employees due to IS constitutes the central concern of critical research (e.g., Cecez-Kekmanovic 2011; Watson 2004), and given that HR

systems in particular constitute the most direct and extensive form of technology-based control of employees, e-HRM necessarily constitutes a core topical domain for future critical research by its very nature.

However, there are also evident *problems* of the critical approach for e-HRM research. A first and very basic concern refers to the adequate degree of critique and transformation, i.e., the question of how critical "critical research" should actually be. Whereas moderate versions might seek to improve e-HRM with a view on underprivileged stakeholders, more radical versions might go far beyond this and seek to completely eliminate e-HRM as an oppressive conception of technological surveillance. Critical research thus involves the risk of closing down the entire research domain. It is therefore crucial for future critical e-HRM research to balance pluralistic interests and avoid a mere replacement of one monistic approach ("managerialism") by another monistic approach ("emancipationism"). This requires that managers and their interests in managing HR electronically be accepted as one legitimate stakeholder group among other legitimate stakeholder groups. A second and related point refers to the crucial importance of the transformation objective of critical research. If critical research is restricted to mere critique as in the example above, it runs the risk of becoming a "science of accusation" that takes pleasure in blaming whatever developments might emerge in e-HRM but neither offers any alternative nor accepts any responsibility. To avoid such purely reactive and destructive e-HRM research, it is necessary to combine insights and critique with constructive suggestions for transformation (Alvesson 2009; Watson 2004). A third point relates to the problem of "forced" emancipation, i.e., the attempt to transform existing structures even though the affected persons do not call for such changes because they do not recognise certain oppressions. Critical research in e-HRM must thus avoid this problem of establishing another form of domination (Cecez-Kekmanovic 2005). Finally, the current methodical openness discussed above might incur the risk of an "anything goes"-methodology that evades proper substantiation and justification. Future critical e-HRM research should hence be keenly interested in the further development of its foundations, such as empirical methods, use of theories and corresponding possibilities of generalisations, among others.

3.3 Interpretive Research Approach

3.3.1 Description of Interpretive Research

The interpretive research approach (also "interpretivism", "interpretative research", "[social] constructivism") is more common in both e-HRM parent disciplines (e.g., Klein and Myers 1999; McKenna et al. 2008). In particular, interpretivism is regarded as a more customary approach in the context of e-HRM research and there is a stock of papers that can be classified as "interpretive".

Again, however, interpretivism does not constitute a highly homogeneous approach but shows heterogeneity, and, for instance, hermeutics, phenomenology or ethnography constitute different interpretive strands (e.g., Klein and Myers 1999; McKenna et al. 2008). The constitutive characteristics of interpretive research refer to assumptions on the existence of being, the relation of knowing and being, and the objectives and methods of research.

Starting with the *existence of being*, interpretivism rejects the view of a given and existing world and assumes that at least the human domain is subjectively constructed by humans (e.g., Orlikowski and Baroudi 1991; Walsham 1995). The (human part of the) world thus exists not as such, but only as and in the human cognitive construction of it; evidently, this constitutes a distinct constructivist ontological position.

This has direct consequences for the *relation of knowing and being*. Assuming that the world is individually constructed merely by and during the process of recognition, research cannot refer to being as such but to human constructions or—to introduce the approach's eponymous term—human *interpretations* of it. This first implies that interpretive research necessarily focuses on people and their interpretations, and second, that interpretive research has to be understood as a meta-interpretation, i.e., the interpretations of researchers of the interpretations of researched persons (Walsham 1995). The interpretations of different researchers could be consistent. However, given that interpretations are inevitably subjective, they could also clearly and lastingly differ—thereby leading to the possibility of several "different realities" (e.g., McKenna et al. 2008; Walsham 1995). This evidently classifies interpretive epistemology as a constructivist approach.

These assumptions have clear consequences for the *objectives of research*, which refer to understanding people's interpretations and actions within their contexts (e.g., Klein and Myers 1999; Walsham 1995). Interpretations thereby refer to a broader set of mental characteristics, such as the meanings, values, feelings and/or interests of the people who are participating in the context under consideration. Contextual aspects refer to multiple relevant environmental features such as tasks, responsibilities, and technologies, among others. Understanding refers to subjectively reconstructing how certain interpretations in certain contexts lead to certain actions. "Understanding" phenomena therefore clearly differs from "explaining" phenomena, given that it involves iterative circles of considering the meanings of the parts and the meaning of the whole that they form, which is called the "hermeneutic circle". In doing so, the possibly diverging subjective interpretations of different participants must be confronted and balanced (Klein and Myers 1999). To realise understanding, interpretive research seeks so-called "thick descriptions", i.e., descriptions that are detailed, vivid, colourful and authentic (e.g., Cecez-Kekmanovic 2005; Walsham 1995). With the main objective of understanding, an intellectualist position is adopted initially. However, there are also variations, with clear research interventions such as interpretive action research (e.g., Walsham 1995). Thus, mere intellectualist and combined intellectualist-interventionist positions constitute varieties of interpretive research (Orlikowski and Baroudi 1991).

Given that contexts, interpretations and actions have to be understood in-depth and expressed as "thick descriptions", interpretive research relies on *methods of research* that allow for the close contact and interaction of researchers and researched persons. Thus, interactive and even participative methods such as field studies, action research, case studies, discourse analysis or ethnographic studies are employed (e.g., Klein and Myers 1999; Walsham 1995). Within these methods, empirical information on contexts, interpretations and actions are gathered from different sources, such as documents, archival records, interviews, direct observation, or physical artefacts (Walsham 1995). To avoid preoccupations of perceptions and their resulting interpretations, a guiding theory is not usually employed. The interpretive research methodology is therefore of a distinctly qualitative nature. However, the frequent equalisation of interpretive and qualitative research is erroneous because there are also qualitative varieties of critical or post-positive research (e.g., Walsham 1995). Moreover, given the ongoing advancements in the methods and software used for interpretive research (e.g., Mayrhofer 2009), the fact that it is "qualitative" does not mean that interpretive research lacks methodical rules and procedures.

The additional criteria refer to supplementary characteristics of interpretivism, although, again, the heterogeneity of the literature frequently aggravates any concise reproduction. Referring to *regularities of being,* interpretivism basically assumes human indeterminism, given that humans can freely decide on their actions (Walsham 1995). Moreover, empiricism and rationalism constitute interacting *sources of knowing* in interpretive research. Referring to the *consideration of values*, it was already clarified that the values of participating persons must be considered as part of their interpretations. However, in clear contrast to the critical approach, interpretive researchers do not include and employ own value positions (e.g., Cecez-Kekmanovic 2005 and 2011). Although it basically considers values, interpretivism therefore has to be classified as a non-normative approach. A very controversial and crucial point refers to the range of the *validity of interpretive research* (e.g., Cecez-Kekmanovic 2005; Williams 2000). Whether and how interpretive research is able to generalise its interpretations, and, as a particularly important subissue, whether (generalisable) theories constitute an intended result of interpretivism, is unresolved. On the one hand, ontological indeterminism implies historically unique phenomena and thus marks a distinct idiographic position (Klein and Myers 1999). On the other hand, there are clear claims for the abstraction and generalisation of interpretive results (e.g., Klein and Myers 1999; Walsham 1995). Such generalisations might refer to general theoretical concepts or even theoretical frameworks that result from interpretive studies (Walsham 1995).

3.3.2 Example of Interpretive Research

To illustrate the interpretive approach in e-HRM, an ideal–typical interpretive research paper is presented (Tansley and Newell 2007). The study relates to the mutual perspectives and interactions of two project managers from the HR and IS

arenas in a human resource information system (HRIS) development project (Tansley and Newell 2007, p. 95). Again, this topic at least hints at an interpretive work, given that people and their interpretations of an e-HRM-relevant process constitute the central focus of the study. There is no explicit theory as the foundation of the study; however, several theoretical concepts relevant to the generation and communication of meaning, such as "situated learning", "relational knowledge" or "interpretive schemes", are introduced and subsequently connected as the study's specific framework (Tansley and Newell, 2007, pp. 98–102). The study employs an ethnographic field study in which researchers accompany the HRIS development project over two years. The empirical methods of participating observations in project team meetings, interviews with both project managers and members of the team, as well as informal discussions with team members, were employed. The results are presented in an "ethnographic narrative" (Tansley and Newell 2007, pp. 101). The employed methods clearly reveal a "typical" interpretive study that seeks in-depth knowledge gained from a single instance through the use of qualitative methods. Moreover, given that researchers participate in but do not enact practice, an intellectualist variety of interpretive research is provided. As result, the study offers an in-depth narrative of a very crucial early phase of the project ("agenda setting") that uncovers the clearly differing perspectives of the HR and IS managers on the project objectives, the resulting conflicts and their resolution. Deep insights into the respective attitudes, feelings and points of view of the managers are thereby presented (Tansley and Newell 2007, pp. 102–108). In a subsequent step, an abstraction from the empirical results is offered by relating empirical elements to the theoretical concepts presented at the beginning, and re-describing the results on a more general level. For example, the "HRIS vision" as an empirical element is re-described as a metaphor that was useful for making sense (Tansley and Newell 2007, pp. 108–113). In conclusion, a few cautious generalisations for further scholarly consideration are presented, e.g., that metaphors *can* have sense-making value (Tansley and Newell 2007, pp. 113–115). Beyond this, some general implications for practice, such as using metaphors to overcome interpretive barriers, are derived (Tansley and Newell 2007, pp. 115).

3.3.3 Discussion of Interpretive Research

The interpretive approach offers obvious *opportunities* for e-HRM research. As a basic advantage, the marked focus on people allows for actor-related aspects of e-HRM to be emphasised and researched. Actors are the persons who realise e-HRM related processes (i.e., planning, providing, operating, and applying HR technologies) and are thus considered to be crucial in both the intended and unintended consequences of e-HRM (e.g., Strohmeier 2007 and 2009). In-depth knowledge on actor-related aspects is hence of central interest to e-HRM research, while these customarily refer to the duality of directly observable actions (e.g., the rejection of a self-assessment system) and the corresponding not directly observable mental states (e.g., severe privacy concerns). Evidently, interpretive research is well

equipped to research this duality, given that the approach directly aims to understand human actions caused by internal interpretations in contexts. Such actor-related research can be realised on the micro-level, i.e., referring to single actors, but also on the meso-level, i.e., referring to groups of actors and their interactions. The interpretive research approach thereby enables the in-depth consideration of the highly relevant psychological and social-psychological dimension of e-HRM.

However, there are also *problems* related to the interpretive research approach in e-HRM research. A first and crucial point refers to the degree of validity and usefulness of interpretive results. Understanding the human domain as undetermined implies that research addresses historically unique phenomena, which interdicts any "abstraction" or "generalisation" of the findings. Even if the idea of uniqueness is relinquished and ontic regularities are assumed, the usual single instance approach of interpretive research still raises the notorious question of the inductive generalisability of the findings. Employing abstractions and generalisations of interpretive results (e.g., Klein and Myers 1999; Walsham 1995) hence requires a very basic reconsideration of these questions. In addition, the assumption of constructivism clearly relativises interpretive results and detracts from their applicability. The fact that research results are subjective interpretations of subjective interpretations implies the possibility of lasting divergences of both first and second order interpretations ("different realities"). Even if there is a consensus of interpretations, this does not ultimately exclude the possibility of diverging interpretations in the future. In the worst case, interpretive e-HRM research could thereby offer results that are idiographic (strictly related to the historic case investigated) and uncertain (always open to diverging interpretations). Interpretive research might thus run the risk of becoming a "science of the uncertain uniqueness", which is understandably not very helpful for practitioners. Thus, future interpretive e-HRM research needs to elaborate on the validity and usefulness of its results. An additional problem might emerge from the topical deviation of interpretive e-HRM research. The strong focus on human interpretation and (inter) action necessarily emphasises (socio-) psychological questions, such as how people assign meaning, how people interact, how personal disputes emerge, etc. As depicted above, this is highly relevant in the e-HRM domain as well. However, there is the risk of general (social-) psychological topics—consciously or subconsciously—coming to the foreground of research while e-HRM constitutes the rather accidental and exchangeable empirical domain in which these general socio-psychological insights are gained. In other words, interpretive e-HRM research could tend to not investigate the peculiarities and idiosyncrasies of e-HRM, which (should) constitute the core topics of e-HRM research. Evidently, future interpretive e-HRM research should also be aware of this potential topical deviation.

3.4 Post-positive Research Approach

3.4.1 Description of Post-positive Research

The post-positive approach constitutes the dominant paradigm in both parent disciplines of e-HRM (e.g., Orlikowski and Baroudi 1991; Watson 2004). This also applies to current e-HRM research, in which many studies can be classified as post-positivistic. The approach is not "monolithic" and a very basic bisection distinguishes an earlier positive (also "logical positivism", "logical empiricism") and a later post-positive (also "post-empiricism", "critical rationalism") research approach. Both varieties show some similarities as well as substantial differences, and are thus sometimes classified as different research approaches (e.g., Goles and Hirschheim, 2000; Myers and Klein 2011). In the following, positivism and post-positivism[1] are used to distinguish both varieties, although Anglo-American research in particular frequently uses the term "positivism" to describe the latter approach as well. Post-positivism constitutes a well-discussed approach and the existence and regularities of being, the connection between knowing and being, and the validity, objectives and methods of research form constitutive characteristics.

Starting with the *existence of being,* the approach represents a realist position that assumes that the world exists "outside" of human perception. This is also true for the social domain, which is manmade, and, in this sense, "constructed". However, like other artificial elements of the world, the human domain exists as such, i.e., not only as a cognitive human construction (Bunge 1967a, b; Burell and Morgan 1979).

Moreover, the major post-positive assumption on *regularities of being* is given by the concept of causality. Frequently, causality is seen as the determination of a subsequent event ("effect") by an antecedent event ("cause"). However, this merely constitutes the basic form of a usually more complex regularity, such as mutual, continued ("causal chains"), multiple, moderated, time-dependent or non-linear causation, among others (e.g., Bunge 1959). Evidently, this is based on supposed equivalences with the natural sciences and exposes that post-positivism adopts a deterministic ontological position.

The *relation of knowing and being* is seen as a structural correspondence between knowing and being, which is known as epistemological realism (e.g., Carlson 2010). The truth is thus explained based on correspondence theory and functions as a regulatory idea to evaluate the quality of (scientific) knowledge. Whereas early varieties of positivism assumed a naïve one-to-one relation of knowing and being, post-positivism refers to a critical realism that is aware that knowing maps being only in a highly selective, and, unfortunately, often erroneous way (e.g., Bunge 1967a, b).

[1] "Post-positivism", however, constitutes a rather unfortunate designation, given that it does not refer to a major characteristic of the approach but instead to its succession of another approach.

Furthermore, relating to the *validity of research,* post-positivism decidedly looks for generalisable research results. This is based on the assumption of the underlying causal regularities that research should utilise for producing generalisable ("law-like") statements to explain and predict phenomena (e.g., Bunge 1967a, b; Orlikowksi and Baroudi 1991). Post-positive research therefore clearly marks a nomological position.

Based on this, the basic *objectives of research* are generalisable insights into regularities, which should—usually—be interesting and relevant for managing an organisation. For this reason, the approach is frequently seen as (and sometimes also criticised for being) a monistic "managerialist" approach (e.g., Alvesson 2009; Goles and Hirschheim 2000). Although it is certainly true that post-positive research regularly aims to support management, it must be stressed that this is a historical coincidence (because many management-oriented researchers have adopted this approach) but not a compelling consequence of the approach itself (because non-managerial post-positive research is not only possible but also practiced).

The *methods of post-positive research* necessarily correspond with its objectives. Post-positive research follows the hypothetical-deductive approach, which explains an event by deducing a hypothesis (which postulates the event under consideration) from a general law or theory and trying to falsify it empirically. If continuously performed, this process of "conjectures and refutations" should contribute to improved theories and improved knowledge of the investigated domain (Popper 1963). This forms a sharp contrast to the earlier approach of positivism, which sought pure empirical knowledge (and therefore rejected theoretical knowledge as a preoccupation of human perception), generalisations via inductive reasoning and verification through empirical proof. Due to the evident limitations of empirical perception (many parts of reality are "hidden" and not directly accessible to human perception) and the evident problems with inductive generalisation and verification (it is *not* possible to "verify" statements based on empirical observations, even if there are many consistent observations), positivism was replaced by post-positivism (Bunge 1967a, b; Popper 1963). To test hypotheses, usually data from a larger set of randomly selected instances are collected and analysed using sophisticated quantitative methods. However, to explore more complex phenomena in detail, qualitative studies are also increasingly seen as an adequate methodical alternative despite the fact that they do not offer representative results.

The remaining supplementary characteristics refer to the source of knowledge and the consideration of values. In terms of the *source of knowledge,* the methodical remarks above reveal post-positivism as a basically rationalist approach that uses empiricism for evaluation, whereas positivism, in contrast, represents a distinctly empirical approach. Finally, there are also clear assumptions on the *considerations of values*. It is frequently emphasised that post-positivism pursues the positions of value-freeness because values do not dispose of a truth-value (e.g., Cecez-Kekmanovic 2011; Goles and Hirschheim 2000). However,

only own value-positions of research are excluded, whereas it is of course possible to investigate existing domain values. Post-positivism therefore takes a clear objectivist position.

3.4.2 Example of Post-Positive Research

For a deeper illustration of post-positive research in e-HRM, an ideal–typical paper is again briefly presented (Parry 2011). The study relates to the question of whether e-HRM constitutes a means to increase the corporate value of the HR-function (Parry 2011, p. 1146). Although the topic does not directly indicate a post-positive study, at least the managerial orientation of the paper becomes recognizable. The foundation of the paper is based on an explicit theoretical approach—the resource-based view, which explains the competitive advantages of companies in terms of their existing internal resources (e.g., Barney 1991). The paper introduces the approach and its previous adoption in HR before the role of e-HRM in increasing the value of HRM, and, thereby contributing to competitive advantage (Parry 2011, pp. 1147–1148). The method of the study visibly follows the hypothetical-deductive approach. Based on the resource-based view—and also noticeably based on existing e-HRM literature—six hypotheses that concretise the value generated by e-HRM are derived (Parry, 2011, pp. 1149–1152). These hypotheses assume that e-HRM leads to different value contributions, such as the reduction of ratio of HR staff to total staff, or a more strategic orientation of the HR function. An example of how a general cause is related to different general effects is thereby offered. The following test of the hypotheses is based on a (very) large-scale cross-sectional survey of firms ($n = 2{,}777$) in different countries ($n = 12$), in which the measurement of the different variables is described in detail (Parry 2011, pp. 1152–1153). The subsequent quantitative data analysis follows the typical standard-pattern of post-positivism: Before the hypotheses are tested based on a multivariate analysis (least square regression), mono- and bivariate analyses are conducted. The use of diverse quality measures, such as testing for multicollinearity or common method bias (Parry 2011, pp. 1155–1157), also constitutes a typical characteristic of the sophisticated methodical instruments of post-positivism. Subsequently, quantitative results are presented and interpreted: For example, e-HRM usage is not systematically associated with the reduction of HR staff, but, as expected, e-HRM is associated with a more strategic role of the HR function. This is *ex post* "explained" by the fact that HR professionals might be redeployed to focus on strategic activities (Parry 2011, pp. 1158–1159). In this way, the results are systematically discussed and conclusions pertaining to the value contribution of e-HRM are drawn. The paper ends with an outline of its limitations and implications for future research, including the call for more "qualitative research" on the subject. However, explicit implications for practice—a very common component of post-positivist research—are not derived (Parry 2011, pp. 1159–1160).

3.4.3 Discussion of Post-Positive Research

Post-positive research visibly offers *opportunities* for e-HRM research. A first and major advantage pertains to the possibility of uncovering existing empirical regularities related to e-HRM, which offer generalisable insights and are therefore suitable for explaining and predicting related empirical phenomena. Such knowledge is urgently needed in order to "come to grips" with the multifarious and quickly developing field of e-HRM (Stone and Dulebohn 2013). The main stakeholders, research and practice of e-HRM will clearly benefit from deeper insights of this type. Moreover, the ongoing application of post-positive research could also contribute to the improvement of theories from the areas of management and information systems. Beyond the confirmation or rejection of such theories, this might also refer to theoretical modifications and refinements. Finally, given that the e-HRM field currently lacks any endogenous theory, the development of endogenous middle range theories of e-HRM, such as a theory of electronic recruiting, might also constitute a prominent long-term objective and outcome of post-positive e-HRM research.

Nonetheless, post-positivism also presents certain *problems* for e-HRM research. A first crucial point refers to the frequent inadequacy of simple causation in the e-HRM domain, which can be demonstrated based on studies on the consequences of e-HRM. Research on consequences is characterised by lastingly divergent empirical results, such as that HR staff decreased or increased or that the costs of the HR department decreased or increased due to the application of HR technologies (Strohmeier 2009). By analysing this, it could be shown that the idea of simple causation, i.e., understanding technology as the cause and the consequence(s) under consideration as the effect(s), is inadequate. A more complex conceptualisation refers to the idea that technologies offer certain (determined) ranges of application and change potentials, which (undetermined) human actors might use in different ways. Based on this conception, it became possible to explain inconvenient empirical phenomena, such as clearly differing or dynamically changing consequences of e-HRM (Strohmeier 2009). However, this constitutes an "explanation of the principle" (Hayek 1955), i.e., it shows how consequences of e-HRM occur "in principle", but, due to the complexity and partial indetermination of inducing conditions, does not allow for the prediction of concrete consequences. The resulting insight that e-HRM-related phenomena are usually complex and include deterministic and voluntaristic components, unmasks the expectation of simple "law-like" statements that can be used to handily explain and predict the entire range of e-HRM phenomena, as rather naïve. Thus, instead of assuming and researching simple causal structures and thereby becoming a "science of trivialisation", future post-positive research should understand and accept e-HRM as a complex domain with inherent limitations for explanation and prediction. Similarly, an additional problem pertains to the potential lack of relevance of post-positive results. Like that of its parent disciplines, e-HRM research also tends to show a research practice-gap (e.g., Olivas-Luján and Rosseau 2010), and results of e-HRM research are often not

exceptionally interesting and useful for e-HRM practitioners. For instance, there is certain evidence (also) in post-positive e-HRM research that electronic HR-systems are accepted by end-users if they are perceived as "useful" and "easy to use". However, it is understandable that practitioners will perceive the resulting practical implication to develop or purchase systems that are "useful" and "easy to use" as trivial. Consequently, despite its clear and occasionally criticised managerial orientation, post-positive e-HRM research might run the risk of becoming an "end in itself-science" that is not interesting for persons outside the post-positive research community.

3.5 Design Research Approach

3.5.1 Description of Design Research

The design approach (also "design science") is more broadly discussed in IS research (e.g., Hevner 2004; Iivari 2007) and there are few methodological contributions in the greater field of management research (e.g., van Aken 2004 and 2005). Thus, within the recent debate, a technically and a managerially oriented stream of design research can be distinguished, although the former particularly exhibits some internal heterogeneity (Winter 2008; Hevner and Chatterjee 2010). Referring to e-HRM research, design science has thus far constituted a clear niche approach and very few papers can be classified as design-oriented (Strohmeier 2012). The major constitutive characteristics of the design approach in particular refer to its objectives, validity and methods of research.

The basic *objective of design research* is solving real world problems with technological (e.g., Hevner 2004; Peffers et al. 2007/2008) and/or managerial solutions (e.g., van Aken, 2004 and 2005). A major motivation of both streams can thus be found in the perceived lack of relevance of conventional post-positive research in both information systems (e.g., Applegate 1999; Robey and Markus 1998) and (HR) management (e.g., van Aken 2004 and 2005). A promising approach thus pertains to the development of innovative technological or managerial solutions through research (instead of waiting for such innovations to emerge in practice and investigating them *ex post facto*). Such solutions should relate to real-world problems that have not been solved thus far or that have a solution that still requires improvement (e.g., Carlsson 2010; Hevner et al. 2004). Technological solutions refer to artefacts; a widely accepted categorisation of artefacts distinguishes between constructs (vocabulary and symbols used to describe problems and solutions), models (abstractions and representations of problems and solutions), methods (algorithms and practices used to solve problems), and instantiations (prototypes and ready-to-use IS) (March and Smith 1995). Managerial solutions additionally refer to non-technical "interventions" (van Aken 2004 and 2005). To distinguish design research from mere design practice (i.e., practical software engineering and/or practical consultancy), it is regularly

claimed that technological and managerial solutions should be based on theoretical foundations (e.g., van Aken 2005; Walls et al. 1992) and should have proved their operativeness in empirical evaluations (e.g., Hevner and Chatterjee 2010; van Aken 2005). Referring to the theoretical foundation, the technically oriented design research stream has coined the term of "kernel theories" for theories related to the relevant phenomena of the investigated domain that explain why a certain solution works (e.g., Fischer et al. 2010; Kuechler and Vaishnavi 2008). Design research therefore distinctly aims to improve practice and must thus be classified as a clear interventionalist approach.

Regarding the *validity of design research*, it is regularly emphasised that design research should not aim to offer a concrete (instance of a) solution for a concrete (instance of a) problem (e.g., a concrete prototypical artefact along with proof of its practical operativeness), but instead offer classes of solutions for classes of problems (e.g., Gregor and Jones 2007; van Aken 2005). In this respect, the technically oriented stream has developed the interesting idea of "design theories" as a major objective of design research (e.g., Fischer et al. 2010; Aier and Fischer 2011). Design theories basically refer to the processes and methods of designing a class of artefacts that offer general insights into how to design workable solutions for the entire problem class. Design theories therefore may (e.g., Gregor and Jones 2007) or may not (e.g., Venable 2006) incorporate the kernel theories. As scientific theories, design theories should be subject to empirical tests that confirm or reject included hypotheses on design. For this reason, concrete (instances of) artefacts are still needed and developed, although not as a major objective of design research but as a precondition of evaluating the overall design theory empirically. Design research therefore clearly seeks generalisable results.

Relating to the *methods of research,* design research basically follows the hypothetical-deductive scheme described above. Because both the technical and managerial stream claim the usage of domain ("kernel") theories, these have to be employed to derive general testable hypotheses concerning why and how the proposed solution class actually solves the investigated class of problems (e.g., Hevner and Chatterjee 2010; van Aken 2005). As a peculiar methodical requirement, at least one instance of the solution, i.e., technical artefact or managerial intervention, has to be developed as a precondition of testing the respective hypotheses. In this context, it is, however, emphasised that designing such solutions is a highly innovative and creative activity for which it is difficult to employ operational methods (e.g., Iivari 2007). In any case, the technical stream of design research thereby introduces methods of software engineering as an additional, thus far unfamiliar and complex set of research methods (e.g., Hevner et al. 2004). Subsequently, the derived hypotheses have to be tested based on the concrete artefact or intervention. This procedure of proposing hypotheses, developing respective instances of solutions and testing the hypotheses based on the instances should also be employed if kernel theories are expanded to overarching design theories.

Referring to further supplementary criteria, design research mostly follows the assumptions of post-positive research (Iivari 2007; for an opposing minority

position, see Niehaves 2007), i.e., a critical realist ontology and epistemology is combined with the position of value-free research. Also resembling post-positivism, current design research tends towards "managerialism", although this is, again, not a logically compelling consequence and a "pluralistic design" of innovative solutions is possible, if not desirable.

3.5.2 Example of Design Research

To illustrate the design approach in e-HRM, an ideal–typical research study is used (Strohmeier 2012). The study relates to the design and evaluation of semantic job search engines (SJSEs) for e-recruiting. This topic indicates a clearly technology-oriented design study, which—given that there are already job search engines—aims to improve existing solutions for the problem of electronically searching for jobs, e.g., on a company website or a web job-board. SJSEs seek to improve electronic job searches by also searching for synonyms, hyperonyms and hyponyms of the entered search term. The goal is thus to offer a search engine that functions as if it "understands the meaning" of the search operation, which evidently explains its denomination as "semantic" (Strohmeier 2012, p. 382). The investigated class of problems is therefore electronic job search, and SJSEs constitute the proposed class of improved solutions for this problem class. As a kernel theory, the IS success model (DeLone and McLean 2003), which substantiates why and how semantic job search might improve user benefits, is used as the foundation of the study. Concretely, it is hypothesised that semantic job search increases information quality and thus the satisfaction, usage intentions and benefits of job searchers (Strohmeier 2012, pp. 381-382). Subsequently, the development and result of a prototypical SJSE is presented by providing an overview of the architecture of the system and introducing its different components, such as storage, annotation, or search components. From a technical perspective, why and how these components are realised and how they interact is revealed (Strohmeier 2012, pp. 384–386). Based on this artefact, the hypotheses are empirically evaluated based on a cross-sectional survey of persons who used the prototype. After ascertaining the data, multivariate analysis (structural equation modelling) is used to test the hypotheses, which could be clearly confirmed (Strohmeier 2012, pp. 386–389). Thus, the main results of the study were that how and why semantic job search constitutes a solution class that is able to improve conventional previous solutions of the problem class of "electronic job search" could be shown.

3.5.3 Discussion of Design Research

A major *opportunity* of design research in e-HRM lies in the generation of actually innovative *and* relevant research results. Although offered knowledge on classes of artefacts or interventions may not be directly applicable in practice, design research offers distinctly concrete and operative instructions about how to generate

an applicable instance of a solution. In particular, technical artefacts developed based on these instructions can be easily distributed to and used in many organisations facing the same problem (-class). Contributing in this way to the solution of unsolved problems or to the improvement of solutions of solved problems meets the requirement of research relevance in an outstanding manner. Beyond offering solutions for real-world problems, the test of domain ("kernel") theories and contributions to deeper domain knowledge also constitute evident opportunities of design research (Strohmeier 2012). In addition, when evaluating artefacts, many relevant e-HRM research questions, such as acceptance, adoption, or consequences of a certain artefact category, can also be addressed by design research (Strohmeier 2007 and 2012). Both the managerial and, in particular, the technical stream of design research hence indicate a clear improvement of e-HRM research.

However, the design approach also presents *problems* for e-HRM research. A first problem might involve the topical narrowing of e-HRM research. Dealing with unsolved or improvable problems of e-HRM practice doubtlessly constitutes a promising area of research; however, this does not cover the entire spectrum of e-HRM related topics. For example, international comparative e-HRM constitutes a broader under-researched domain with many detail topics (Ruël and Bondarouk 2012) that can mostly not be investigated through the design approach. In this way, when propagating design research as a promising approach, further topical areas of e-HRM should not be lost sight of. Moreover, emphasising the relevance of research might imply the risk of losing the methodical rigor of e-HRM research. In particular, mere solution-focused procedures without theoretical foundation run the risk of coinciding with practical software-engineering and consultancy, which also propose to solve real-world HR problems. However, theoretically grounded and empirically based approaches offer a clear vision of design research as a serious *scientific* endeavour—thereby clearly differentiating design research from design practice without losing relevance (e.g., Venable 2006). A third problem is the expansion of quantitative effort and qualitative requirements by design research. Design research first clearly enhances the quantitative effort of research. In particular, the development of the artefact or intervention may turn out to be effortful and lengthy given that innovative and thus far unknown solutions have to be developed. Before finding the final solution, prolonged "trial and error" processes tend to be the usual procedure (e.g., Strohmeier 2012). The development and test of design theories and the evaluation of artefacts or interventions are also effortful. As shown in the example, the mere empirical evaluation of an artefact is already comparable to a full-fledged conventional post-positive research project (Strohmeier 2012). Moreover, technical design research particularly poses considerable qualitative requirements. Given that e-HRM researchers regularly come from the HR or IS disciplines, they usually do not dispose of the necessary background in software engineering. This problem is aggravated by the fact that innovative artefacts at the "cutting edge" of IT innovation, not simple standard solutions, regularly have to be developed. Thus, either broad and deep software engineering qualifications need to be acquired or cooperation with experienced computer scientists is necessary for technical design research (Strohmeier 2012).

4 Conclusions: Approach Pluralism

The current chapter sought to categorise and analyse major research approaches in e-HRM. After briefly deriving a set of criteria that are meaningful for categorising and analysing research approaches, a quadripartite categorisation of relevant research approaches could be provided and the respective approaches could be analysed based on the catalogue of criteria. The results of this procedure are summarised in Fig. 2. Given that all presented approaches offer opportunities but also present problems, the question of how these research approaches should be adopted in future e-HRM research arises.

At first glance, *approach monism*, i.e., the concentration on one common approach, might be seen as promising. This would allow for direct communication and cooperation between all e-HRM researchers and lead to a highly coherent and cumulative research domain (e.g., Robey 1996). However, both the possibility and the usefulness of monism are questionable. Referring to the possibility, the pluralism of e-HRM research approaches constitutes an empirical fact and it is hard to see why and how the disciplinary, intellectually, and culturally disparate group of e-HRM researchers could agree on a single approach. Moreover, in terms of usefulness, any concentration on one approach and its potential wastefully relinquishes the potential of the other approaches.

Thus, *approach pluralism*, i.e., the parallel and/or complementary adoption of different research approaches, might be better to cope with the multifarious and quickly developing research field of e-HRM. *Approach parallelism* refers to the parallel but isolated adoption of different research approaches in e-HRM. Currently, approach parallelism (particularly parallelism of the frequent interpretive and post-positive approaches) seems to represent the actual state of e-HRM research. The mere parallel application of different approaches on different topics of e-HRM and their presentation in joint conferences and joint publication outlets, however, does not constitute an advantage in itself and could lead to "schizophrenic compendia of unrelated research reports" (Robey 1996, 402). Thus, future e-HRM research could benefit from the conscious parallel and comparative adoption of different approaches on the same concrete e-HRM topic. This should greatly expand the perspective on the investigated question—and additionally deepen the insights on the potential and limitations of the respective research approaches (cf. the example of multi-paradigmatic work in HR research by McKenna et al. 2011). This could be realised through the cooperation of researchers with different paradigmatic orientations because a realisation by a single researcher might be limited by the high demands of being an expert in different approaches (Deetz 1996). Moreover, given that the adoption of a certain approach is deeply rooted in the own fundamental convictions and history of a researcher, switching too easily between different incommensurable research approaches (e.g., Burell and Morgan 1979; Kuhn 1976) might be judged as unprincipled methodological opportunism. As another type of pluralism, *approach complementarity* offers additional possibilities for e-HRM research. For instance,

		critical approach	interpretive approach	post-positive approach	design approach
related designations		critical theory; critical (social) research	interpretivism; (social) constructivism	(post-) positivism; critical rationalism	design research; design science
ontology	existence of the being	*diverse positions*	merely constructed by and in human recognition *	objective existence of being *	objective existence of being
	regularities of the being	dialectical contradictions and ongoing change *	indetermination of the human domain	(complex) causal relationships *	(complex) causal relationships
epistemology	relation of knowing and being	*diverse positions*	subjective, possibly differing interpretations of interpretations *	(selective and possibly erroneous) correspondence *	(selective and possibly erroneous) correspondence
	source of knowing	interaction of reasoning and perception	interaction of reasoning ("hermeneutic circle") and perception	reasoning confirmed or rejected by perception	reasoning confirmed or rejected by perception
ethics	consideration of values	consideration of domain values and reflected own value position *	consideration of domain values; no own value position	consideration of domain values possible; no own value position	no own value position
methodology	validity of research	"certain" nonnomological generalisations	*diverse positions*	general (or concretised contingent) validity *	general validity for a class of real-world problems *
	objectives of research	emancipation through insight, critique and transformation *	understanding human interpretations and actions within contexts *	explaining and predicting empirical phenomena *	solving real world problems with technological or managerial solutions *
	methods of research	contextualistic borrowing of exogenous methods	qualitative, single-instance-oriented process aiming at "thick descriptions" *	hypothetical-deductive process with quantitative testing *	software engineering / hypothetical-deductive process with quantitative testing *

* = constitutive characteristics

Fig. 2 Synopsis of e-HRM research approaches

the post-positive approach (which, e.g., representatively ascertains whether a certain situation is perceived as a problem by practitioners) might be combined with the design approach (which, e.g., offers a prototypical artefact to solve the problem)—thereby combining their respective potentials and strengthening the research. However, the at least partial incommensurability of the presented

approaches again clearly restricts the joint application of approaches. Roughly speaking, based on underlying assumptions, combinations of critical and interpretive research and of post-positive and design research seem to be feasible. However, further combinations clearly require a thorough justification of both the basic combinability and the resulting complementarity of the approaches.

Encouraging approach pluralism in future e-HRM research should therefore not be mistaken for a claim in favour of syncretistic applications of incommensurable (fragments of) approaches. Pluralism is instead based on the insight that no single approach can shoulder the load and complexity of researching e-HRM, and thus seeks a conscious, instructed and well-versed application of different approaches in a parallel, and, when possible and useful, also in a complementary manner. It is for this reason that this chapter aimed to categorise and critically analyse the different research approaches that are suitable for e-HRM research.

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e-HRM Research and Practice: Facing the Challenges Ahead

Huub Ruël and Tanya Bondarouk

Abstract The history of e-HRM research extends back about 4 decades. In that time, researchers have provided a rich foundation for a better understanding of issues such as e-HRM implementation, e-HRM usage, and e-HRM outcomes. The past decade in particular saw an impressive growth of publications, but more work is still needed because the field of the intersection of HRM and information technology is dynamic: HRM strategies, policies, practices and instruments as well as information technologies progress. In this chapter, we identify and describe the challenges that lie ahead for e-HRM research based on five earlier publications in the period 2009–2012. We reflect on them and modify them based on recent research outcomes. We conclude that, given the sizeable challenges identified, e-HRM research is far from 'dead'; it is more alive than ever. Furthermore, the number of e-HRM researchers from the HRM field as well as from the IT field needs to grow in order to meet the research challenges that lie ahead.

Keywords e-HRM · e-HRM research · Challenges · Information technologies · Literature review · Social media

1 Introduction

The history of e-HRM research extends back about 4 decades, but it has grown explosively since the new millennium. It has helped the field of e-HRM to mature and provided insights and greatly increased our understanding of the intersection

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between information technology and human resource management. But the knowledge provided is still limited and skewed, as certain angles, perspectives and topics have received less attention. Another aspect is the research methodology used in e-HRM research; this is still limited, and rigour versus relevance is an issue as well.

This chapter addresses the challenges that lie ahead for e-HRM research in terms of the topics and methodology. We believe this is needed in order to inspire e-HRM scholars to conduct further research. First, we will briefly define e-HRM by reflecting on our earlier definition (Bondarouk and Ruël 2009) in view of recent developments in HRM as well as IT. Second, we will identify the challenges for e-HRM research that lie ahead, again reflecting on the challenges we identified earlier, but also analysing recently published reviews of the e-HRM literature. Third, we will describe the challenges and provide ways to address these challenges. Finally, we will project the challenges into the future and describe the current state of the e-HRM debate.

2 e-HRM: In Need of Revision?

e-HRM is an abbreviation standing for electronic human resource management. It originates from a decade that put an 'e' in front of every business-related topic, but especially in front of the word business itself. It was a decade (2000–2010) of the first Internet boom or, as it is sometimes called, the age of web 1.0. Therefore, business became e-business, marketing became e-marketing, supply chain management became e-supply chain management, and human resource management became e-HRM. The great challenge of the new leaves on the tree was to explain what exactly was new by adding the 'e' to an established label for a field of research?

For e-HRM this was a basic challenge as many HRM scholars were quite sceptical about the concept of e-HRM. Was e-HRM just 'old wine in new bottles'? What was new in comparison to earlier automation studies in personnel management? What was new in comparison to office automation studies of the 1970s and 1980s? This debate was finally 'won' by e-HRM scholars as they managed to claim a substantial piece of the HRM cake. This is best evidenced by the number of special issues that have appeared over the past ten years in well-established HRM and IT journals (*Human Resource Management, International Journal of Human Resource Management, Journal of Strategic Information Systems, European Journal of International Management, Human Resource Management Review* and many others).

In 2009 the *International Journal of Human Resource Management* published a special issue on e-HRM. In the editorial of this journal, we aimed to put forward a new, all-inclusive definition of e-HRM after years of discussions on what it is exactly:

> e-HRM is "an umbrella term covering all possible integration mechanisms and contents between HRM and Information Technologies aiming at creating value within and across organizations for targeted employees and management" (Bondarouk and Ruël 2009, p. 507).

This definition was the result of a heated discussion among e-HRM researchers rather than a consensus. The interesting question at this point in time is to reflect on this definition: does it still hold? And will it be able to cover emerging HRM and IT issues and developments?

What can be said is that the definition introduces e-HRM as an 'umbrella term' and that it is not biased towards either HRM or IT. It has a positive slant, as it stresses creating value. Research on e-HRM throughout the years has been quite modest, if not quite sceptical about the value created by e-HRM (Parry 2011). However, claiming that e-HRM should not aim at creating value would sound strange. The definition does not explain what kind of value or what forms and shapes it may take. The problem with this issue is that it leaves much room for interpretation and may 'cover' integration mechanisms and content that cannot really be called e-HRM. Therefore, the suggestion is to specify value creation and extend it *by aiming at making HRM processes more efficient, higher quality, and/or more invested in creating long-term opportunities.*

Second, the definition formulated in 2009 still includes human resource information systems (HRIS) that only target the HR department and are not meant to be implemented and used outside of it. An earlier publication claimed that e-HRM was different from HRIS, especially as e-HRM's focus lies outside the HR department. The question now is, how problematic is this? We recall that one of the core features of the e-movement in its early days was the opening up of data and information resources for the public at large. In the case of e-HRM, it opened up data and information via IT-based tools and channels for the subjects of the data and information. It needed to draw users of e-HRM into the process of co-creating it. Therefore, integration mechanisms and content shared between HRM and IT that is only meant to be used by HR departments do not meet that aim. The definition formulated by Bondarouk and Ruël (2009) needs to be updated.

Third, and in our view the most important critique of the definition is that it aims to explain what e-HRM is as an empirical phenomenon, not as a field of study. What are scholars researching when they study the empirical phenomenon they call e-HRM? And for what reasons? We will attempt to incorporate this aspect.

e-HRM as a field of scholarly inquiry focuses on all integration mechanisms and content shared between IT and HRM, aiming at making HRM processes more efficient, higher quality, and/or more invested in creating long-term opportunities within and across organizations for targeted employees and management outside of the HR department. The field aims to improve the understanding of this phenomenon, to contribute to its progress in terms of its design, its implementation, its interaction with the organizational context, and its effects.

From here we turn to identifying the e-HRM research challenges.

3 Identifying the e-HRM Research Challenges

e-HRM research has grown extensively over the past decade and has helped to provide answers to questions such as whether e-HRM creates value (Bondarouk and Ruël 2013; Parry 2011), which factors influence e-HRM use (…), and how e-HRM can turn HRM into a strategic partner (Marler 2009). But 4 decades of e-HRM have also confronted researchers with the gaps, under-researched areas, inconclusive answers, and ambitious research agendas.

In the period 2009–2012, we were involved in researching and writing five different papers that addressed the challenges for e-HRM research in the years ahead. These papers all resulted from an observation of an omission in e-HRM research: respectively, the lack of a consensus definition of e-HRM and the lack of conclusive answers to whether e-HRM reduces costs (Bondarouk and Ruël 2009), the lack of diverse perspectives in e-HRM research (Ruël et al. 2011), the lack of international and cross-cultural research in e-HRM (Ruël and Bondarouk 2012), the lack of a chronological overview of e-HRM research (Bondarouk and Furtmueller 2012), and the lack of e-HRM research in multinational corporations (Van Geffen et al. 2013).

We shall discuss the main observations and conclusions of these publications. The value of this exercise is that it will provide a rich and multiperspective overview of the e-HRM research challenges that lie ahead.

3.1 Former Challenges for e-HRM Research

In 2009, we wrote an editorial introduction to *The International Journal of Human Resource Management* special issue on e-HRM. Based on a review of the research literature, we concluded there were four challenges for e-HRM research (Bondarouk and Ruël 2009): (1) clarifying the strategic ambiguity of e-HRM, (2) conceptualizing relationships between e-HRM and human capital development, (3) the e-HRM web of delivery channels and perceptions of e-HRM, and (4) measurement of value creation for diverse groups of users (p. 508).

The first challenge, clarifying the strategic ambiguity of e-HRM, refers to the widespread idea that e-HRM enables HR professionals to improve their performance and 'upgrade' themselves to the status of business partners. In this role, HR professionals are assumed to act as internal consultants to senior and line managers (Hussain et al. 2007). They are also assumed to create value and improve their status within their own organization by using e-HRM (Lawler and Mohrman 2003) and to support strategic decision-making based on digitized and automated personnel databases (Broderick and Boudreau 1992). In contrast to these assumed benefits for HR professionals, empirical evidence reveals a more complicated picture of what really happens. e-HRM is mostly used for routine administrative HR tasks (Ball 2001) and not for strategic HR tasks in more than 50 % of the cases

(Hussain et al. 2007); it is used more for administrative goals than for analytical or decision-making support goals (Haines and Lafleur 2008). Furthermore, it brings a certain value to organizations in terms of increased efficiency, service delivery, and standardization of goals, with some evidence of transformational impact (Parry 2011; Parry and Tyson 2011) and that appropriate usage of e-HRM and HR value creation are moderately linked (Ruël and Van der Kaap 2012). However, in the latter case facilitating conditions such as support for users, high data quality, HR professionals' technology competences, and HR policy–practices alignment seem to have a stronger direct linkage with HR value creation than usage as such (Ruël and Van der Kaap 2012). Overall, it seems that turning e-HRM into a strategic competitive advantage is not as easy and straightforward as assumed. The challenge for e-HRM research is to solve this ambiguity regarding the strategic 'hopes' and reality of e-HRM in organizations. One way forward regarding this issue is to build more constructively on existing research. e-HRM scholars should adopt a coherent framework or theoretical perspective from which scholars could continue step-by-step to get this issue 'solved'. To date, this has not been the case, and e-HRM studies seem to connect with existing studies only in the discussion section of articles and papers. New studies should start from existing frameworks, theoretical perspectives and outcomes, with the aim to reassess or improve them.

The second challenge, conceptualizing relationships between e-HRM and human capital development, refers to the growing importance of economies outside of 'the West' and the need for multinational corporations (MNCs) to attract and retain talent. e-HRM can be a facilitator in global talent management, especially with social media making it easy to reach beyond borders. Bondarouk and Ruël (2013) found that the most attractive employers do not necessarily use social media such as LinkedIn and Facebook in an optimal way. The results of the quasi-experimental research design revealed that the corporate websites are found to be more attractive than the way the same companies present themselves via social media. Another study on global talent management (GTM) and the role of social networks (Ruël et al. 2013) showed that graduate students do find social networks important for multinationals' efforts to recruit talent, but HR managers are sceptical about the use of social networks for GTM and do not use it extensively for this purpose. Ruta (2009) presents a case study that showed that if HR portals are aligned with the HR strategy, this does leverage intellectual capital creation and development.

Clearly, e-HRM research is facing a challenge to understand the relationship between e-HRM and human capital development and talent management, especially in view of the new 'avenues' of e-HRM such as social media. The latter is some sort of 'bulk' concept for all kinds of web-based and mobile device-based communication and interaction channels, and it is beyond doubt that these channels will develop and diversify further in the years ahead. Also on the talent management side, further developments will emerge in view of changing attitudes to the work-life balance, importance of sustainability, the aging populations in the West, changes in the very juvenile and dynamic societies in the Middle East, and the increasing importance of multinationals from emerging economies. Luckily,

there are clear signs that e-HRM researchers have picked up on this challenge (Bondarouk and Olivas-Lujan 2013; Lyons and Marler 2011).

The third challenge, the maturation of the e-HRM web of delivery channels, reflects developments in organizations where 'doing HR' is no longer restricted to the HR department and line managers but has diversified with the emergence of external HR service providers, HR shared service centres, and the involvement of and the responsibilities assigned to non-managerial employees. Information technology has enabled HR services to be provided relatively easily by parties outside the organizational boundaries. For example, HR shared service centres (HR SSCs) can deliver HR services to multiple organizations at the same time, while being located physically far away from the client organization. Within multinational corporations, an HR SSC may serve all its branches and subsidiaries in a geographical region. The core point of the challenge, therefore, is the multiple 'faces' of e-HRM (face-to-face, electronic device, external party electronic HR service delivery, and employees' own involvement and responsibility) and the configuration of these 'faces' in order to optimize HR processes to serve an organization's bottom line. HR SSC research has taken off to a certain extent (Farndale et al. 2009; Meijerink et al. 2013/in press) and is producing results, but much more is needed to serve HR academia and the HR practice.

The fourth challenge, the measurement of value creation for diverse groups of users, refers to the issue of the multiple interpretations and perceptions of the value created by e-HRM. e-HRM aims to serve a diverse group of users, from senior management to non-managerial employees. e-HRM research has so far not been able to come up with a clear set of measures/indicators for value creation per target group. Evidence from earlier studies indicates that it is not clear where exactly value is being created. Most of the studies seem to suggest that the actual usage by end users explains whether or not e-HRM creates value. A recent study by Ruël and Van der Kaap (2012) shows that besides e-HRM appropriation and frequency of use, organizational context, or more precisely facilitating conditions such as support from HR professionals, and HR policy-practice consistency explain e-HRM value creation significantly.

e-HRM research needs to be able to come up with a defined set of outcome measures per category of users. Only this will help to clear up the vague conversation about how e-HRM is creating value. This will help future research, calm the discussion among e-HRM scholars, and increase the value of e-HRM research for the practice (Bondarouk et al. 2011).

3.2 An Integrative IT-Organization Perspective on e-HRM

Information technology (IT) and organizations keep on integrating in today's world, and there are no signs that this process is coming to an end. The impacts of this ongoing integration are contradictory (Ruël et al. 2004). Results displayed by this integration are delayering as well as relayering organizational structures,

deskilling as well as upskilling personnel, introducing more autocratic management styles as well as more participative management styles, and breaking down organizational boundaries as well as erecting organizational boundaries (Ruël et al. 2011). This observation invites a reframing of the relationship between IT and organization, away from a relatively simple cause and effect line of reasoning, where IT is usually considered the cause of effects on the organization. A paper published in 2011 (Ruël et al. 2011) proposed to 'solve' the issue of one-way determinism by calling for a perspective that sees IT and organization as an 'intricate net of interrelationships where there are no exclusive one-to-relationships. The net is made up of a number of interrelated factors or phenomena that sometimes act as the cause and other times act as the consequence of the integration of IT artefacts into organizations' (Ruël et al. 2011, p. 23).

The phenomena referred to are: automation of tasks and processes, textualization of information, concerns over IT costs, new forms of managerial control, compression of competitive time, hypercompetition, outsourcing, convergence of info-com, organizational knowledge as competitive pressure, new forms of IT alignment, organizational change orientation, and integrating the information systems function. They have all been derived from the literature on IT and organizations and are considered the major themes that emerge from or are dealt with in the literature. The authors took these phenomena as the point of departure for formulating a research agenda for e-HRM and human resource information systems (HRIS) research.

The list of questions raised is impressive, and they have so far been addressed in a limited number of studies. The question is whether all of them need an answer and what kind of audience is addressed, academics or practitioners or both? This brings in the question of rigor versus relevance. In the field of IT, a group of scholars made a plea for more design science-oriented research. They feel this will increase the relevance of IT research dramatically. A similar plea has been made by Strohmeier (2012): the relevance of e-HRM research up to now has not been impressive in his view. And integrative perspective on IT and organization could be useful to turn e-HRM research into more 'relevant' directions as this perspective aims to shift from a predominantly deterministic perspective to focus more on processes. Research with a process focus investigates 'mechanisms' regarding how phenomena occur. This may very likely bring more insightful research findings for practitioners (Tables 1, 2).

A critique can also be raised on this type of research: research findings that provide insights into how phenomena occur often produce results that may not be directly transferable to other situations, as they are mostly based on single case studies (Eisenhardt 1989). Adding to this critique is the comment that perspectives that focus on processes usually reveal 'mechanisms', but it is still hard to turn this into knowledge of how to act.

Nevertheless, a more process-oriented stream of research, based on an integrative research lens, would definitely help the e-HRM field to accumulate knowledge and provide valuable insights for e-HRM theory and practice.

Table 1 A summary of research questions emerging from an integrated IT-organization perspective

Phenomena	Research questions for e-HRM/HRIS resulting from this phenomena
The automation of tasks and processes and HRIS	• How do employees and line managers respond to this transfer of HR-related activities? • How do organizations cope with the new division of HR-related tasks between employees themselves, line managers, IS department, and HR staff?
The costs of IT: expansion and control	• To what extent are HRIS implementations a consequence of a period of expansion? • What happens to HRIS implementations in periods of control? • Who are the main sponsors of HRIS investments and how do different types of sponsors affect HRIS implementation? • How does HRIS use affect productivity or the return on investment of HRIS?
New forms of managerial control	• How do managers use the new possibilities for managerial control? • How can an organizational culture be matched with specific control habits and the control mechanisms and tool available? • What kind of coping strategies do subordinates employ with HRIS-based managerial tools? • To what extent do organizations become more self-aware through using more and more HRIS tools?
Compression of competitive time	• To what extent do HRISs contribute to organizational flexibility? • How can HRISs facilitate a flexible business strategy? • How can HRISs be used to create a competitive advantage? • How is competence-based management being impacted by HRISs?
Outsourcing	• What are the consequences of outsourcing for HRIS effectiveness? • To what extent do managers and employees trust outsourced HR services? • How can internal, outsourced HR services and the deployment of HRIS applications be balanced?
Convergence of info-com	• How does convergence of HRISs impact HR professionals' roles and activities? • What organizational needs trigger further convergence of IT for HR purposes? • How does the use of HRISs by managers and employees influence convergence of HRISs?

(continued)

Table 1 (continued)

Phenomena	Research questions for e-HRM/HRIS resulting from this phenomena
Organizational knowledge as a competitive pressure	• How can HRISs support organizational knowledge development, sharing, and maintenance? • What are the mechanisms through which HRISs facilitate or inhibit organizational knowledge development? • How do employees integrate HRIS-supported strategic alignment? What roles should HR professionals, employees, and managers fulfil in an HRIS-supported aligned company?
Organizational change orientation	• What are the conditions for successful HRIS-supported organizational change? • How can different types of organizational change be supported with HRISs? • How can HRISs help to overcome resistance to organizational change?
Integration of the IT function with other business functions	• How can the IT function be successfully integrated with the HR function? • Which HR roles should IT professionals understand? • Which IT roles should HR professionals understand? • How can IT and HR professionals communicate effectively in order to design new HRIS functionalities?

Table 2 e-HRM implementation factors and consequences 1970–2010 (Bondarouk and Furtmueller 2012)

Implementation		
Technology factors	Organizational factors	People factors
Current IT architecture	Demographics (age, size, sector) organ knowledge and skills	Communication qualities
Digitalizing HR data	Organizational policies and practices	Employee demographics
Technology project management	Project management	Employee and management attitudes (support and commitment)
	Resources	Employee and management involvement
		Employee and management skills versus training needs
		Organizational culture and leadership
		Psychological factors

Consequences		
Operational consequences	Relational consequences	Transformational consequences
HR cost savings	HR attitude management	HR globalization
HR efficiency	HR communications	HR knowledge management
HR effectiveness	HR relationship management	
	HR status	HR planning
	HR service improvements	HR strategic change management

3.3 e-HRM in a Cross-National Perspective

With the growing importance of the multinational corporation during the 1990s and 2000s and the realisation that this type of organization was among the early adopters of e-HRM, the need for a cross-border and cross-cultural perspective and understanding of e-HRM has grown. But as Ruël and Bondarouk (2012) observed, the amount of e-HRM research providing such a perspective and understanding is very low. Until 2010 (results of our counts in the 2011 and 2012 papers), only seven studies on e-HRM with cross-continental data had been published, five studies on e-HRM with cross-national data but within one continent, two studies on e-HRM with cross-national data but within one multinational company, and 15 studies on e-HRM focusing on a specific national context, but in a non-comparative manner.

These observations confront e-HRM researchers with the challenge to fill this gap. But what exactly is needed? How can this gap be closed? Especially in times when the economic role of the West is diminishing and the role of countries such as Brazil, China, India, and Indonesia is rising significantly, this challenge becomes more urgent. Dominant e-HRM systems and applications have a Western origin and therefore may implicitly and explicitly 'promote' or reinforce Western business values and practices.

What is needed is more knowledge on how e-HRM technology works out in different national as well as cultural contexts and why? Questions like to what extent does e-HRM technology push HR strategies, policies and practices to converge? How does this work? And how can it be explained? To what extent is e-HRM technology culturally biased? Can it help to develop as well as to advance theories on the relationship between HR, IT and organization? And can it be useful for multinational corporations to guide their actions when rolling out new e-HRM systems and applications and to explain why earlier roll-outs worked out differently than expected, or even failed completely? Human resource management keeps on advancing, as does technology, and all of this during a global economic power shift to the East. Therefore, there is a continuous need for knowledge and insights.

For theorists as well as for practitioners, it is of interest to be able to understand why it is complicated for HR practices supported by information technologies to produce the targeted results in multinational and multicultural settings. The debate on standardisation–localisation may provide a useful lens for the area of organisation and management practices (e.g. Porter 1986; Prahalad and Doz 1987). This debate concentrates on the company or meso-level, while a closely linked debate on convergence-divergence is more focused on the macro-level (Pudelko and Harzing 2007). Standardisation–localisation deals with the questions of to what extent subsidiaries of multinational companies are behaving as local firms (localisation) versus to what extent their practices are similar to those of the headquarters (standardisation) (Rosenzweig and Nohria 1994). HRM studies are involved in this debate because they deal with the management of people and are

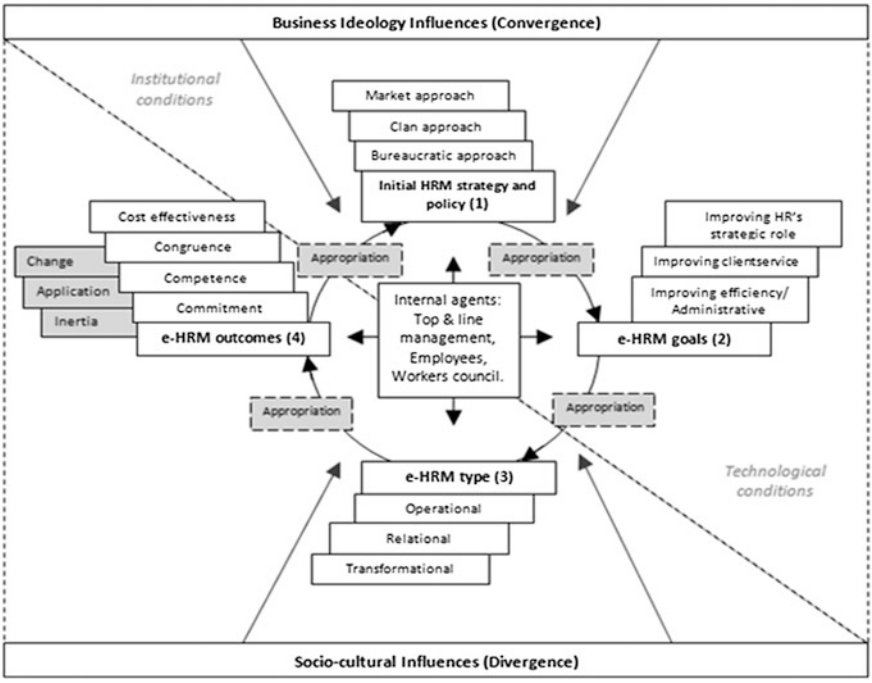

Fig. 1 Conceptual framework for e-HRM in a multinational context (Ruël and Bondarouk 2012)

therefore considered least likely to converge across countries. MNCs seem more likely to localise practices than to export country-of-origin practices (Pudelko and Harzing 2007; Leat and El-Kot 2007).

The literature mentions several factors that determine the degree of standardisation. Prahalad and Doz (1987) mention seven pressures for standardisation, like high technological intensity, the presence of multinational competitors, and cost reduction. Other factors which determine the degree of standardisation are the relationship between the headquarters and the subsidiary, organisational culture, authority structures, market characteristics, and work norms (Parry et al. 2008). Factors that may pressure for localization of HRM practices include unions, labour market, legal and political context (Brewster 1995; Ngo et al. 1998).

Studies on e-HRM standardization and localization do not exist except for conceptual work by Ruël and Bondarouk (2012). The conceptual framework (Fig. 1) presented in this study is based on empirical semi-structured interview data with four MNCs in Lebanon. The e-HRM phenomenon consists of four stages (projected as a cycle) representing four questions: stage one—what kind of HRM approach is dominant in an organization? stage two—what are the goals of e-HRM in an organization within the context of the overall HRM approach? stage three—what type of e-HRM results from the goals? stage four—what kind of e-HRM consequences does an organization want to see emerge?

Based on the pilot study data, we conclude that standardization forces (driven by business ideology influences) tend to be dominant in stages one and two. Localization forces tend to become apparent in stages three and four (driven by socio-cultural influences). In more concrete terms, the conceptual framework hypothesizes that e-HRM in different national or cultural contexts will show standardization tendencies during stage one (HRM approach) and stage two (e-HRM goals). Localization tendencies will appear during stage three (e-HRM types) and stage four (e-HRM consequences). As a result, MNCs may show similarities all around the world in the wording of their HRM approach and the formulation and choice of e-HRM goals (driven by capitalist business ideology) but may differ in what their e-HRM looks like (e-HRM types) and what the result of e-HRM usage looks like (e-HRM consequences) (driven by local socio-cultural values).

But this is just a starting point for research on international e-HRM and e-HRM in MNCs. The challenges that lie ahead for e-HRM research and practice are manifold. As propose, their conceptual framework can be used for different types of research approaches. Quantitative research designs can shed more light on the extent to which standardization and localization tendencies do influence the different e-HRM stages; qualitative research designs can provide insights into how these tendencies influence the different e-HRM stages.

Another challenge is to add theoretical lenses, such as political, behavioural, economic, and cultural ones. Each of these lenses brings its own specific set of research questions. A political lens will question the role of power and how it is exercised in e-HRM projects and roll outs, and how power plays a role in the standardization and localization of e-HRM. A behavioural lens will focus on the role of individual actions and interpersonal interactions, an economic lens will focus on quantifying the costs and benefits of standardization and localization of e-HRM, and a cultural lens helps to clarify how the cultural backgrounds of actors involved in e-HRM projects play a role in shaping e-HRM.

Finally, comparative studies on e-HRM are needed, studies that put e-HRM goals, types, and outcomes in different national and cultural contexts side by side. From such studies researchers and practitioners can learn how context and e-HRM 'content' influence each other.

3.4 e-HRM Research: A Chronological Perspective

e-HRM research has a history extending back about 4 decades, starting more or less with a publication from 1977. Bondarouk and Furtmueller (2012) conducted a structured literature review with the aim to provide a chronological overview of how e-HRM research started off and progressed over the years. The review reveals two streams of literature, one focussing on factors that should be considered when implementing e-HRM technology and another studying the consequences of e-HRM systems. The first stream is dominated by IT-oriented scholars, the second one by organizational and HRM scholars.

The 'implementation factors' that have been included in e-HRM studies over the past 40 years fall into three categories: technological, organizational, and people factors. One of the major conclusions in e-HRM research is that an effective technical implementation of e-HRM is not necessarily linked to organizational e-HRM effectiveness (Bondarouk and Furtmueller 2012). Acceptance of e-HRM applications, systems and technologies by end-users, in most cases employees and managers, is the crucial link between the technical implementation of e-HRM and its organizational effectiveness.

A number of observations arise when reviewing 40 years of e-HRM research. New, more specific e-HRM goals have surfaced, such as improved HR service provision and the strategic reorientation of HR departments (see Marler 2009). It has also become clear that e-HRM can simplify, enrich, steer and support, shorten and speed up the process of achieving goals for organizations and individual end-users (Bondarouk and Furtmueller 2012). But the way e-HRM is introduced and implemented in organizations is crucial for this process to materialize. Research has not so far found the one single factor that can explain successful e-HRM implementation, as Bondarouk and Furtmueller's review concludes. However, people factors such as leadership, trust, change management, and communication have been shown to be the most relevant ones for e-HRM success.

A chronological overview of 40 years of e-HRM research can clearly pinpoint the challenges for e-HRM research and practice that lie ahead. Given the increasing complexity in e-HRM theory and practice, a 'multi-functional' e-HRM approach is needed. The factors and consequences identified in e-HRM research have to be studied for separate functional HRM areas, as the existing findings can hardly be applied directly to individual e-HRM applications. In most research e-HRM is considered from an 'all-inclusive' perspective, not specifying applications as such.

Another challenge surfacing from the chronological review of the e-HRM literature is the lack of focus on *how* success factors and barriers support or constrain the processes and activities that were supposed to benefit from an e-HRM application. To solve this issue, more process-oriented research is needed, studies that focus on more than the extent to which certain factors play a role in e-HRM implementation success and certain consequences occur because of e-HRM usage. Future e-HRM research needs to 'dig' into the processes and investigate how activities, decisions, and behaviours are related to each other and impact each other. This may also help to solve the relevance gap of e-HRM research that is sometimes mentioned (e.g. Strohmeier 2007). More in-depth studies may result in insights that are more practically relevant.

A third challenge stressed by Bondarouk and Furtmueller is that e-HRM research needs to become more precise. A concept such as implementation is complex and consists of different stages in practice. Research should pay attention to this in order to make research findings more useful and again more practically relevant.

A fourth challenge is the almost sheer absence of environmental and moderating factors in e-HRM studies. Organizational characteristics such as size and

industry, and end-user characteristics such as age and gender, are hardly taken into account. Nor are factors that 'surround' e-HRM implementation processes, such as HRM strategies and practices. These factors bring more clarity to the e-HRM field and provide useful insights for theory and practice. A recent exception to the lack of research including environmental factors is the study by Ruël and Van der Kaap (2012).

Finally, the concept of e-HRM effectiveness is multi-dimensional and can be measured at different levels: organizational, team, and individual. This needs to be addressed in future e-HRM research. Perhaps more uniformity would be helpful as it makes the consequences more comparable and in this way provides better insights.

3.5 e-HRM in Multinational Corporations: Lessons to be Learned from IT in MNC Research

Although e-HRM research extends back 40 years, most studies have been published since the year 2000. It is a relatively young field and has drawn from the IT/IS discipline and from the HR discipline in terms of theoretical and conceptual inputs. But researchers have been selective and have overlooked large parts of what is available in the HR discipline as well as in the IT/IS discipline. Especially the latter still has a lot to offer to e-HRM research. Van Geffen et al. (2013) identified this 'underutilization' of the IT/IS literature as a source of inputs for e-HRM in a multinational and multicultural setting. They conducted a systematic literature review using the terms 'information systems' (and its alternatives) and multinational corporation (and its alternatives) and searched academic databases. Additionally, the top 10 journals in the IS field were checked (using the Journal Citation Report 2011). All abstracts of articles published in the period 2006–2011 (a total of 225) found from the search were read and analysed by three researchers independently. Articles needed to focus on IS in a multinational corporation. Benchmark studies were excluded, as were unpublished studies and Master/PhD theses. The final number of articles that were included was 53. The analysis led to the construction of a framework (Fig. 2).

The review resulted in a number of interesting observations. The IS literature is quite rich in studies on IS in multinational corporations that focus on pre-implementation (system selection, IS characteristics, IS development methodologies and issues, alignment issues and resource availability), implementation (preparation, adaptation, and integration), and post-implementation (IS adoption and IS results). Contextual (environmental) factors are also addressed in at least 10 publications. The e-HRM literature, on the other hand, contains only a few studies dealing with e-HRM in MNCs, and only covering topics such as motivation for e-HRM implementation, the alignment of e-HRM, integration of e-HRM, and e-HRM adoption and e-HRM results. The total number of e-HRM in MNCs

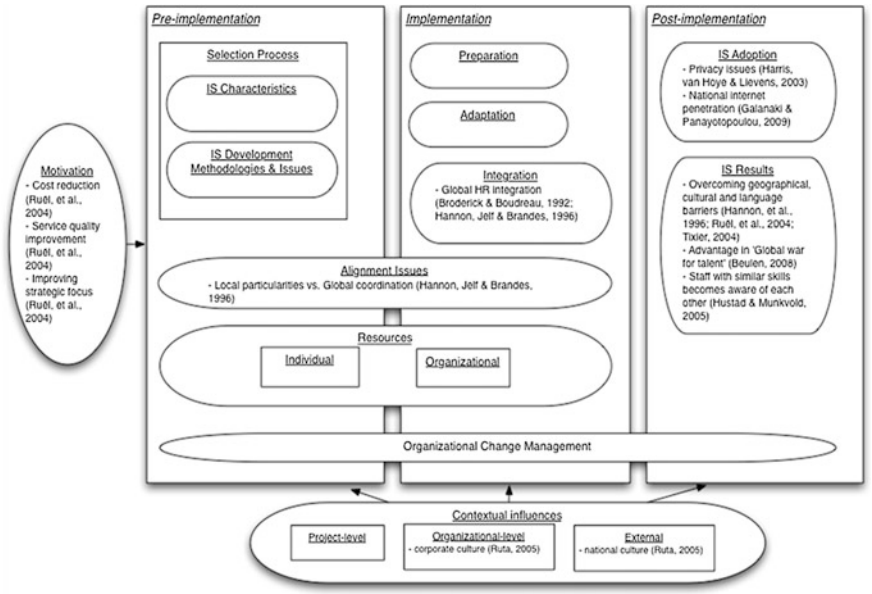

Fig. 2 Analytical framework with IS in multinational corporations studies (Van Geffen et al. 2013)

studies is close to 10. This leaves us with the clear conclusion that e-HRM research really should draw from the IS literature when it comes to research on e-HRM in a multinational corporation and multicultural setting.

The IS literature has much to offer to the e-HRM research community and e-HRM in practice. Of course, e-HRM is not analogous to IS, something that we keep on stressing. However, the IS research community has dealt with similar challenges in the past to those that the e-HRM community is facing.

4 Conclusion and Reflection

This chapter presents a broad, rich and in-depth overview of the challenges for e-HRM research and practice. It is too easy to conclude that the previous sections have clearly shown that there are many challenges. There is much more to say. First of all, e-HRM research is far from 'dead', it is actually more alive than ever, and it is also more in need than ever. HR without technology is hard to imagine nowadays, and the future will only be more conceptually and empirically challenging, with new HRM developments together with new technological progress. The relationship between HRM and technology will get even closer in the future.

Researchers and practitioners need to be aware of this and to try to understand this closer relationship as a matter of urgency.

Practitioners may sometimes be reluctant to admit that they need e-HRM research as their organizations already have e-HRM up and running. However, the reality is that due to a lack of conceptual and theoretical understanding as well as a lack of knowledge from empirical e-HRM studies, practitioners very often do not identify problems or options for improvement or innovation. Their reality has become the standard.

e-HRM researchers may sometimes be reluctant to admit that they lack in-depth knowledge of the complexities of e-HRM projects. As a result, they may not address the most relevant research questions in the eyes of practitioners. e-HRM research needs open-minded, curious practitioners and practice-oriented e-HRM researchers.

Given this sizeable challenge, does it mean that e-HRM research needs more e-HRM researchers? Our answer to this question is 'yes', too few HRM researchers have included the technology component in their research questions, whether social media, enterprise resource planning systems, HR channel delivery, or 'just' an HR application. For example, for strategic human resource management implementation or strategic global talent management implementation, the question of how technology can facilitate, moderate, or inhibit this is inevitable. Any research project in this area needs to address the role of technology either as a channel and/or as a content provider.

But too few IT researchers and practitioners have paid attention to human resource management as a functional management area. Human resource management is different from financial management as HRM targets each organization member. In other words, HRM is a key leadership competence; as a strategy and as a practice, HRM is the steering wheel for the human side of an organization. Using technology as a channel, a content provider or a driver for change, HRM is therefore something that involves every organization member.

More IT researchers and practitioners involved in developing or implementing systems and applications related to or involving HRM are needed for e-HRM research. They possess the knowledge and understanding of the technological potential of systems, which is essential for designing and customizing applications. Together with HRM researchers and practitioners, they can contribute to providing the best possible e-HRM solutions.

Appendix

An integrative IT-organization perspective on e-HRM with recent studies

Phenomena	Research questions for e-HRM/HRIS resulting from this phenomena	Recent research dealing with this
The automation of tasks and processes and HRIS	• How do employees and line managers respond to this transfer of HR-related activities? • How do organizations cope with the new division of HR-related tasks between employees themselves, line managers, IS department, and HR staff?	Ruël et al. (2004) Broderick and Boudreau (1991) Heikkilä and Smale (2011), Voermans and Van Veldhoven (2007)
The costs of IT: expansion and control	• To what extent are HRIS implementations a consequence of a period of expansion? • What happens to HRIS implementations in periods of control? • Who are the main sponsors of HRIS investments and how do different types of sponsors affect HRIS implementation? • How does HRIS use affect productivity or the return on investment of HRISs?	Buckley et al. (2004)
New forms of managerial control	• How do managers use the new possibilities for managerial control? • How can an organizational culture be matched with specific control habits and the control mechanisms and tool available? • What kind of coping strategies do subordinates employ with HRIS-based managerial tools? • To what extent are organizations more self-aware by using more and more HRIS tools?	Beulen (2009), Agarwal et al. (2006)
Compression of competitive time	• To what extent do HRISs contribute to organizational flexibility? • How can HRISs facilitate a flexible business strategy? • How can HRISs be used to create a competitive advantage? • How is competence-based management being impacted by HRISs?	Withers and Ebrahimpour (2000), Kovach et al. (2002)

(continued)

(continued)

Phenomena	Research questions for e-HRM/HRIS resulting from this phenomena	Recent research dealing with this
Outsourcing	• What are the consequences of outsourcing for HRIS effectiveness? • To what extent do managers and employees trust outsourced HR services? • How can internal, outsourced HR services and the deployment of HRIS applications be balanced?	Dibbern et al. (2004)
Convergence of info-com	• How does convergence of HRISs impact HR professionals' roles and activities? • What organizational needs trigger further convergence of IT for HR purposes? • How does the use of HRISs by managers and employees influence convergence of HRISs?	Bell et al. (2006) Martinsons and Chong (1999)
Organizational knowledge as a competitive pressure	• How can HRISs support organizational knowledge development, sharing, and maintenance? • What are the mechanisms through which HRISs facilitate or inhibit organizational knowledge development? • How do employees integrate HRIS-supported strategic alignment? • What roles should HR professionals, employees, and managers fulfil in an HRIS-supported aligned company?	Ruta (2009), Hustad and Munkvold (2005)
Organizational change orientation	• What are the conditions for successful HRIS-supported organizational change? • How can different types of organizational change be supported with HRISs? • How can HRISs help to overcome resistance to organizational change?	Svoboda and Schröder (2001), Wilson-Evered and Härtel (2009)
Integration of the IT function with other business functions	• How can the IT function be successfully integrated with the HR function? • Which HR roles should IT professionals understand? • Which IT roles should HR professionals understand? • How can IT and HR professionals communicate effectively in order to design new HRIS functionalities?	Tansley and Newell (2007)

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Part III.4
Key Business Processes, Areas and Activities: Information Systems and Knowledge Management

Knowledge Management Alignment Strategies for Organizations and e-Businesses

Deborah E. Swain and Jean-Pierre Booto Ekionea

Abstract This chapter investigates using strategist types to align knowledge management (KM) and business strategies in an organization. Does such type-analysis apply in an e-business or with m-commerce, as compared to traditional, paper-based organizations? *E-businesses* are companies and organizations with web-based operations throughout or in some parts. *M-commerce* refers to being e-based in a market segment and dependent on technology, such as mobile applications (mobile apps). Also, we ask how strategist-type alignment might make implementation of a KM system (KMS) faster, business processes more efficient, and decision-making more effective? Following presentation of a theoretical framework for a taxonomy grounded in KM literature, case studies are presented as used in qualitative analysis of KMSs for three strategic types of organizations: *Defender*, *Prospector*, and *Analyzer*. Starting with earlier research on strategic alignment in traditional companies, three types of organizations are discussed using case studies: (1) *traditional* organizations using KM; (2) *transitional* organizations converting to e-business operations in some areas; and (3) advanced *m-commerce* businesses operating almost totally in the mobile Internet environment. Thus, this chapter shows researchers how to validate the generalization potential of continuing to align KM and business strategies in new technological environments and shows practitioners how to investigate and plan for a KMS. We recommend determining the type of approach to strategy in an organization before aligning KM strategies and business goals by using the taxonomy presented. Research results suggest that strategic alignment and technological applications for a KMS in an e-business should support the level of strategic risk management preferred by stakeholders and in m-commerce customers should be involved in KM.

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1 Introduction

A culture shift towards web-based business and then mobile applications (mobile apps) led us as researchers to reconsider our taxonomy for aligning strategies for knowledge management (KM) and business (Booto and Swain 2008). We wondered if the three classical strategy types (Miles and Snow 1978) that are based on the different roles and personalities played by strategists: *Defender*, *Prospector*, and *Analyzer* still applied to transitional users of the web and more recent commercial applications of mobile technologies for hand-held devices.

In this chapter, we summarize a set of three case studies for each type of strategist that we used to validate the taxonomy in traditional organizations (Swain and Booto 2008). Then we give detailed presentations of our research methods and qualitative analysis of two more sets of case studies to show how strategic alignment based on the type of strategist has continued to provide value in an Internet world with electronic-based businesses (e-businesses) and mobile commerce (m-commerce), where handheld, communication devices are prevalent.

1.1 Historical Background

It was predicted that in the 1990s the global economy would be transformed from a product-based business to one based on knowledge; therefore, strategies for success and growth would need to change (Nonaka 1994). Knowledge is one of the intangible resources of an organization; however, it can be used to develop and to support tangible productivity. In the late 20th century business environment when strategies based on mergers and global partnerships grew, many traditional companies realized the strategic importance of exploiting knowledge inherited from other companies (Dieng et al. 2000). Large and small companies had to reconsider strategies in an effort to adapt and respond to changes (Grant 1996). Knowledge management (KM) became a business science based on the widespread reorganizing of companies' immaterial richness (Alavi and Leidner 1999; Barney 1991; Nonaka 1998). Many traditional companies saw the opportunities to capture, share and re-use knowledge (Davenport 1998). Furthermore, both research and management practices support the aligning of strategies for information systems with existing business strategies (Abou-Zeid 2003; Asoh et al. 2003; Roth 2003; Swain and Booto 2009). Failure to align may impact performance and lead to the misuse of organizational resources (Luftman et al. 2004; Wernerfelt 1984).

Our work on strategic alignment and the taxonomy (Booto and Swain 2008) was inspired by the cartographic-technocratic approach of Earl (2001), who considered knowledge as a critical resource that is poorly managed and sought to guide executives towards initiating KMSs based on goals, organizational character, and biases. The taxonomy covers the three major branches of KM: the Technocratic School, which consists of codified systems; the Commercial School, which uses codified systems to manage intellectual assets; and the Behavioral School, which is concerned with personal knowledge. As recommended to information and KM managers (Duffy 2001), this chapter provides support for the concept of aligning KM to strategic goals in e-businesses. Thus, the business model for alignment seems to apply to organizations from traditional and transitional companies to e-businesses using the Internet economy and web environment to connect buyers and sellers. Ensuring "that information technology and business strategies and actors are fully aligned" (Duffy 2001, p. 64) when sharing knowledge and collaborating seems to remain significant.

1.2 Definitions

The three approaches to strategy defined by Miles and Snow (1978) were defender, prospector, and analyzer. The *Defender* avoids major adjustments in a business structure or process and limits technology to a specific field of competence. The *Prospector* seeks new products and markets emphasizing continued research and development. Combining aspects of the other two, the *Analyzer* both minimizes risk and maximizes opportunity to grow. These strategist types were used in our development of a taxonomy and conceptual framework for *KM/BS Alignment* (knowledge management and business strategy alignment) in traditional businesses (Booto and Swain 2008). We define *traditional* organizations as using paper-based document and data collections, and primarily using in-person, phone or e-mail communications. Such businesses are still relevant considering that some consultation service companies known for providing customized reports to specific customers continue to use such "low" technology (Griffiths and Remeny 2008; Haas and Hansen 2005; Davenport and Hansen 2002). In comparison, as web-based technology has evolved, *transitional* organizations are those converting to e-business operations in some areas or throughout the business. In our research, we define the *m-commerce* businesses as depending on internet-based cloud networks for data, and mobile app technologies for communications.

More details and examples follow about our research and taxonomy for aligning KM and business goals. The strategy we recommend for KMS development is dependent on the type of strategist defining a business's or organization's goals. The three types (defender, prospector, and analyzer) are illustrated in three sets of case studies for traditional, transitional, and/or m-commerce technology-based organizations. We offer this 3×3 dimensional classification and taxonomy for you to use when doing research on KM or when developing and

implementing a KMS in a specific organization or e-business. So we show you how strategic alignment and technological applications for a KMS in an e-business should support the level of risk management or strategist's approach that is preferred by stakeholders. Also, we conclude that alignment in an m-commerce enterprise should involve customers in KM for better results sharing and utilizing knowledge.

2 Research on KM Alignment and Types of Strategists

Typing of strategists may be inductively applied to KM cases where knowledge management systems (KMS) develop. In our research we wanted to verify the strategy types in case studies, which were collected and used in historical qualitative analysis. We wanted to see if the value of aligning KM and business strategies was evident in transitional e-businesses and m-commerce. A matrix of questions was created, and structures were developed during research based on the types of strategists and 3 levels of applied technology (traditional, transitional and m-commerce). Table 1 shows the original sources for the types of strategists used in the organizational analysis. Note that it may be too much to label each strategy type as a culture class, but many aspects or facets of culture can be factors in alignment (Buchanan and Dawson 2007; Newman and Conrad 1998).

Table 1 Literature sources for context analysis of strategist types and KM

Context: types of strategists	Characteristics and reference sources
Defender	Business strategy based on controlling customers by the improvement of their business processes (Miles and Snow 1978)
	Business performance emphasis on efficiency in KM (Sabherwal and Chan 2001)
	Operations aim to increase returns, to reduce costs and to increase customer satisfaction (Miles and Snow 1978; Lawrence and Lorsh 1967)
Prospector	Strategically seeking new opportunities without interruption (Miles and Snow 1978)
	Business performance emphasis on flexibility (Sabherwal and Chan 2001)
	Operations integrated with aim to increase the output of resources, process enrichment and process effectiveness (Miles and Snow 1978; Lawrence and Lorsh 1967)
Analyzer	Combining business strategies to reduce simultaneously minimum risk while maximizing growth (Miles and Snow 1978)
	Business performance emphasis on both efficiency and flexibility (Sabherwal and Chan 2001)
	Combined operations seen through a prism of comprehensibility for KM (Sabherwal and Chan 2001)

Source derived from Booto and Swain 2008

The case studies reviewed are presented in this chapter in the following order covering specific types of business or organization:

1. *Traditional Businesses*: telecommunications company; web-driven start up; non-profit educational tools organization (previous research).
2. *Transitional e-businesses*: public school organization; oil refinery; global merchandising and marketing company.
3. *Advanced m-commerce Businesses:* (e-based and using emerging technologies) banking mobile app; web-based tool converted to mobile app; shopping app for manufacturer of footwear.

The use of case studies and qualitative analysis is pertinent in KM research as access to a business's strategies is often confidential, which can limit opportunities for large, statistical analysis. Instead KM research may involve historical case studies and interviews to enhance data collection (Griffiths and Remeny 2008) for qualitative analysis. If personal interviews are not possible, then other forms of documentation and observation can be used (Yin 1994). Case studies have been used, for example, in research on return on investment (ROI) from KM (Nadeem 2006). In the KM and ROI study, research was based on non-quantitative data collection and the analysis methods of Lofland and Lofland (1984). The researcher can become a tool or instrument. That is, in a "subjective methodology and researcher as research instrument" approach, the researcher must interpret and make sense of observations, narrations, and descriptions (Nadeem 2006, p. 84).

In more formal, theoretical terms, using case studies is a form of empirical research that analyzes a contemporary phenomenon in its natural state. Sometimes the lines between the context and the phenomenon are not clearly evident, so multiple sources of proof are utilized. Specifically, four types of research plans for a case study are recommended (Yin 1994):

1. Unique case (holistic analysis)
2. Unique case with multiple levels of analysis overlapping
3. Multiple cases with single level analysis
4. Multiple cases with multiple levels overlapping interlinked

In this chapter, we have chosen synthetic research types 3 and 4 for multiple cases. We used single level analysis at first and then multiple levels of overlapping analysis where strategies and technologies are similar and can be interlinked. The specific techniques for collecting data for triangulation were (Yin 1994):

- Use of documents written by officials (or personnel).
- Information furnished by subjects as assisted with questionnaires or semi-structured interviews.

So to ensure a true representation of reality, researchers may utilize numerous sources of information: documents, archives, interviews, questionnaires, direct observation, participative observation, and physical objects (Yin 1994). Also, we followed the approach described by Contandriopoulos and others (1990), which identified three large sources of data from subjects: use of documents, observations

by the researcher, and use of data during interviews. For each set of case studies from traditional, e-business and m-commerce, our research went through phases: (1) definition and design; (2) preparation, collection and data analysis; (3) analysis and conclusion (Contandriopoulos et al. 1990). The final phase includes making inferences based on the implications of cases and inter-case connections within and among the sets of case studies.

In the research to support our taxonomy for alignment, we have used various data sources: historical documents, publications of interviews by journalists, Web site communications, questionnaire results, and meeting observations. For this chapter, we primarily used two data sources: (1) use of documents and (2) information supplied by subjects during interviews from historical data. The scope and main limitation for our research on e-businesses is the use of published sources as primary data, such as textbooks, web reports and company reviews. We also used scholarly articles and conference materials as secondary sources.

2.1 Research Methodology: Matrix-based Qualitative Analysis on Aligning KM and Business Strategies

Our research method supports the view that qualitative research can lead to word-based concepts or models to supplement useful statistics and data numbers. As noted by methodology advocates: "Words, especially organized into incidents or stories, have a concrete, vivid, meaningful flavor that often proves more convincing to a reader—another researcher, a policymaker, a practitioner—than pages of summarized numbers" (Miles and Huberman 1994 p.1).

Determining assumptions about the possibility of improvement for an organization may be useful before doing a research study or analysis of KM alignment. Five assumptions from literature and experience that we used in our research were:

1. Knowledge is an effective resource when it includes tacit and explicit knowledge related to a product, a technology, or a service for the unspecified improvement of individual or collective competences (Nonaka 1994).
2. A business or development process can be enriched when knowledge about laws or regulations, industry rules, procedures, work flow, specifications, standards, and methods are capitalized on (Sharkie 2003).
3. Successful KMSs deploy resources to facilitate integration and differentiation, which improves process effectiveness (Amit and Shoemaker 1993).
4. A strategically aligned KMS applies to both old and new technologies, such as cloud-based networks and smart phone or mobile apps (Grant 1991).
5. For process effectiveness, an organization must have a capacity for coordination of tasks and innovation.

Qualitative data analysis methods used in the social sciences apply a structured, replicable process and tools for the collection and iterative analysis of data. For example, data may be collected for analysis in "three concurrent flows of activity:

data reduction, data display, and conclusion drawing/verification" (Miles and Huberman 1994, p. 10). We used four tools that were generated inductively from the historical data collected for analysis:

1. Strategy change or development chronology in a *timeline* of events;
2. *Causal network diagrams* to analyze influence of alignment on business and operations performance results (iteratively developed during data collection)
3. Dynamic *type-of-strategist matrices* to define organizational preferences impacting performance (based on analysis of chronologies and causal networks)
4. Summary *table of alignment* by strategist type (one each for traditional, transitional e-business, and m-commerce approaches to technology)

The causal networks with boxes and arrows were drawn to represent organizational influences on strategic alignment. They were part of the triangulation of data. In an iterative process, networks were created or combined to represent the events and impacts as more documentation and data were analyzed. Eventually, researchers can refine the causal networks (Miles and Huberman 1994) to reflect social culture. Thus, developing matrices on strategist types was a dynamic process as each matrix evolved during the research.

Overall, an iterative process may not only support deductive analysis, but also inductive analysis to validate or prove an a priori theory of cause. In our studies, we used the latter approach to qualitative data. The qualitative research method we used depended on creating matrices to study and define the organization's culture based on context and in terms of the predominant type of strategist. The method was grounded in the qualitative paradigm of naturalistic study from the human sciences (Smith 1992). Published historical data were used and triangulated with primary and secondary sources from research and online reports. Both successes and failures of alignment were considered.

First, a chronological flow of major changes and results was documented in a timeline. Then causal analysis diagrams were developed to evaluate any alignment effort. Next we used a matrix inductively to establish research questions for analyzing the data on the alignment of KM and business strategies. The matrix is illustrated in Table 2 and was based on theoretical research (see Table 1).

The historical cases briefly summarized in Sect. 2.2 are traditional business organizations whose product plans and strategies represented Defender, Prospector, and Analyzer types as first described by Swain and Booto (2008). The shared context for comparison was based on KM strategies and organizational performance. The same method of qualitative research was again used in the case studies for transitional and m-commerce businesses (see Sects. 2.3 and 2.4). The research presented in this chapter focuses on validating strategic alignment in different e-businesses using types of strategists. As researchers, we asked, can a KM alignment strategy be identified using a taxonomy based on the defender, analyzer and prospector type of strategists in transitional and m-commerce technologies as was done with traditional businesses?

Table 2 Matrix for data analysis of KMS

Strategy type	Business process	KM strategy	Operations
Defend	Does organization plan to control customers by improving business processes?	Is the KMS intended to make processes more efficient?	Will operations be differentiated to grow the market, decrease cost, and satisfy customers?
Prospect	Does business plan to seek opportunities from innovation and investment in R&D?	Is the KMS planned to be flexible with knowledge resources?	Will operations be integrated to use new technology?
Analyze	Is strategy to reduce risk and increase growth?	Are comprehensive KM resources seen as part of KMS?	Will organization combine operation strategies to improve performance?

Source Swain and Booto (2008)

2.2 Historical Study of Traditional Business Organizations

In past research, historical data about KM were collected for three case studies (Swain and Booto 2008). The matrix in Table 1 provided the theoretical basis to establish organizational context for strategists in the traditional businesses. During research and analysis, we applied the matrix as a conceptual framework to historical data collections and to documented interviews. The approach was similar to other KM researchers who have used case studies to define frameworks in analyzing the alignment of KM with competitive strategies and business intelligence (Griffiths and Remeny 2008).

An entity-relationship analysis based on Henderson and Venkatraman (1993) was used (Booto and Swain 2008). It was assumed that the type of KM strategy can direct the performance measurement of a KMS and that Critical Success Factors (CSF) in a business can be measured by performance and contribute to measurements of business performance overall. As a management tool or for research, the table provided dimensions for the *KM/BS Alignment* model. The research on procedural alignments of traditional businesses and KM strategies supported the theoretical definitions of strategist types: defender, analyzer and prospector. Three case studies (Swain and Booto 2008) were presented:

1. First, a project at a large telecommunications company was investigated. Records of interviews were used to analyze KM activities. The business was involved in traditional telecommunications products for phone companies, and it was found to illustrate the Defender context and strategy type.
2. The second organization was a team assigned to deliver new, advanced technologies to support wireless and mobile networks. The strategy and implementation suggested a Prospector culture.
3. The third organization was a non-profit, grant-based team that had a strategic goal of delivering to traditional educators class materials using a digital library

technology. As collaborators and thoughtful strategists, the organization's context and culture illustrated the Analyzer approach.

Our expanded approach to the qualitative analysis methodology and tools are described next. Examples are provided from case studies (1) of transitional e-businesses that apply web-based technology in limited areas, and (2) of e-based, non-traditional businesses that depend on new technology and m-commerce, such as mobile apps.

2.3 Case Studies of Transitional e-Businesses

Have transitional e-businesses that use electronic data applied business alignment in their KM applications and strategic planning? We asked this question while searching for examples of non-profits, companies, corporations and government organizations for this chapter. Examples we found that suggested alignment were classified into two categories (see full list in the Appendix):

1. *Transitional e-businesses*—companies and organizations with web-based operations throughout or in some parts.
2. *Advanced e-based businesses*—companies and organizations that are electronically based in a market segment and dependent on advanced technology, such as mobile applications (mobile apps), for sales or communications for m-commerce.

The case studies included traditional companies or organizations using electronic tools for knowledge management "to create, store, transfer, and apply knowledge" (Laudon and Laudon 2012, p. 419) in specific divisions or departments. Among the transitional e-businesses, we found three pertinent cases of strategy alignment success where the KM and business strategists' type varied. The selected e-business cases were supported by textbook analysis (Laudon and Laudon 2012) and verified in triangulation assessment research as described. Each case study illustrated one of the strategist types: a US school system (Defender); an energy company (Prospector); and a global manufacturer and merchandiser (Analyzer). A summary of the research on the case studies follows.

2.3.1 Transitional Defender Organization

When faced with increased pressure to improve student performance, a public educational organization, such as Montgomery County Schools in Maryland (USA), decided to defend its strategies with analytics based on data and information already available and the application of new KM. School administrators implemented a KMS using data retrieved from web-based operations. The organization collected

e-based test information and analyzed student and school performance more quickly than with paper-based tests and reports. The business technology changes were summarized in a timeline or chronology (Hechinger 2009; de Vise 2009):

- Before 2000—Edline and M-Stat data systems used by accountability administrators to report on math and reading about 139,000 student.
- After 2000—develop grades and test scores data collection system for school principals to analyze student performance.
- 2001–2008—design interventions developed to improve learning and address gaps (www.montgomeryschoolsmd.org, retrieved April 3, 2012).
- 2005–2008—use of e-tools, such as handheld devices to collect reading data and store in data warehouse (www.datadrivenclassroom.com; retrieved April 5, 2012).
- 2010—improving scores documented.

By using electronic tools like Edline and M-Stat data systems, administrators implemented a system for decision-making that principals and teachers could access as well as parents eventually (Ujifusa 2011). Previously, non-electronic data had been hard to retrieve and organize. Strategic business/education issues addressed by the KM project were: national concern about school students being behind; closing achievement gaps between whites and minorities; measuring learning performance; identification of patterns; definition of interventions to decrease problems; design and apply interventions (Laudon and Laudon 2012).

Levels of importance (low, medium, high) were applied to major issues. Causal networks were built and revised based on triangulation from different historical reports and reviews. The causal networks illustrated strategies based on business issues and actions. Figure 1 is an example of a High Level causal network analyzed to document alignment.

An important goal was to improve school performance among minorities and low-income students. Over time the e-system became a KMS aligned with the business goal to increase reading skills. From only 44 % of low-income kindergartners seven years before, reading skills increased to 90 % (Hechinger 2009; de Vise 2009). Another strategy that the KMS aligned with was a low-cost approach to collecting diagnosis data to place students in appropriate classes and programs.

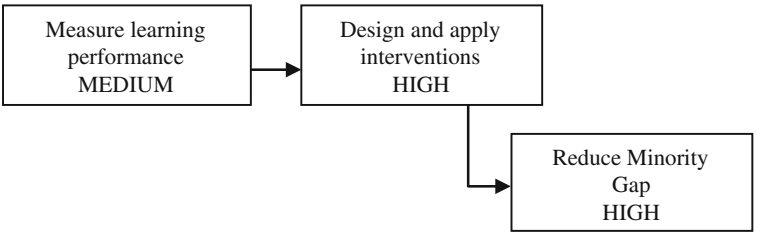

Fig. 1 Causal network for transitional defender

Table 3 Classification matrix for transitional defender

Categories	Defender
Business strategy	Keep risk and administrative costs low
	Increase parent and taxpayer (customer) satisfaction with performance
KM strategy	Be efficient throughout project: creating and collecting data; implementing interventions for problem areas; measuring improvement
Operation implementation	Train teachers to use processes; approach considered cheaper to meet improvement expectations
	Measure production results or performance quickly (funding limits)

After using questions from the strategist-type Table 2, alignment paths in the taxonomy were applied to Montgomery County Schools e-business and analyzed iteratively. Matrices were built and revised as business and KM strategies were documented. Results of analysis were distilled into matrices like the classification matrix presented in(Table 3).

The Montgomery County Schools used a Defender approach when aligning KM and business strategies. Defending its strategy and implementing KMS tasks that used current, up-to-date data for analysis required training and communication to convince teachers. However, such an application of new processes was a low-risk approach compared to building new schools, education "products" or systems. Knowledge sharing among teachers and administrators (and later parents) became an important aspect of business in Montgomery County Schools. Early progress was measured (within two years of initiative). Efforts to transition from paper continue to improve learning and to support expanding the KMS (Ujifusa 2011).

2.3.2 Transitional Prospector Organization

Prospector strategists were identified in innovative companies or organizations seeking early market share, aligning strategies and applying new, e-business technologies. A KMS provided up-to-date data in the oil industry, for example. Prospecting for knowledge to support more efficiency at Valero Energy was as important as prospecting for oil. Valero is a large refinery company based in San Antonio, Texas whose case study illustrates transitioning to e-business. Their alignment chronology was summarized in this timeline:

- Before 2008—collects through SAP historical data on equipment, inventory, processing, and energy consumption statistics
- 2008—executive proposes developing KMS so real-time can be reported in a dashboard display covering company's 16 refinery plants
- 2009—"Refining Dashboard" available on the web for executives and plant managers in San Antonio and remote locations.
- 2008–2010—weak global economy reduces demand for oil products
- 2010—KMS estimated to save $230 million annually; more dashboards proposed and developed.

When the Valero chief operating officer requested a dashboard to monitor plants in 2008, he could not have predicted an economic slowdown. The knowledge base provided real-time, accurate, reliable information for reviewing performance at all sites. Valero and other refineries aimed to move inventory and not to store many oil products each day (Kanywani 2008) as a strategy to improve business and thrive in a slow era. A KMS with a central monitor displayed status from all plants every five minutes to support decision-making by executives (Kahn 2010).

Their basic business strategy was to prepare a production plan for refineries. Refinery plant managers were on-call to explain changes in production, good or bad, and to propose actions to correct problems. Aligning the KMS with strategic business issues determined the design of the knowledge base, data collection, and dashboard display. A sample causal network from the case study (Fig. 2) shows how a plant's performance was based on equipment in an early KMS and output tracked as influenced by KMS strategy alignment.

Pressured by market changes and a slow economy, from 2008 to 2010 Valero had to rely on improving narrow margins for sustaining profits. Strategists who sought innovation defined the Prospector company approach to alignment (Table 4).

Although the refinery industry is not highly flexible, Valero's KMS helped. Their real-time knowledge systems and e-business reporting helped them save money and maintain profits when refined oil demand and prices dropped (Kahn 2010; Laudon and Laudon 2012). Illustrating a Prospector alignment strategy, they tried new knowledge-sharing processes during a slow economy. Valero transitioned to an e-business model with an aligned KMS that used web-based dashboards and sending reports on 16 plants to their managers and operators. Through alignment, they integrated processes and made equipment adjustments efficiently.

2.3.3 Transitional Analyzer Organization

The Analyzer approach can be a hybrid: being more flexible while keeping risk at a minimum like a Defender but also seeking to grow like a Prospector. If a business or organization can be flexible while aligning KM and business strategies,

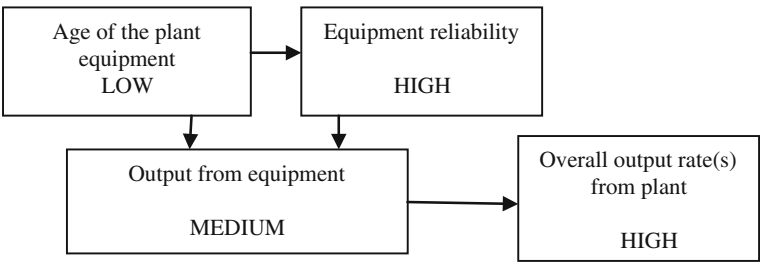

Fig. 2 Causal network for transitional prospector

Table 4 Classification matrix for transitional prospector

Categories	Prospector
Business strategy	Track closely market share as oil prices fluctuate; see early share when prices rise; manage risk
	Apply new technology for plant equipment and management
KM strategy	Collect same data and knowledge on plant performance; not flexible
Operation implementation	Apply real-time knowledge collection process
	Apply plant performance changes immediately to correct problems
	Integrate business and knowledge applications for performance efficiency solutions

then transitioning to an e-business model can be effective for the global market. However, differentiation may be required at first. At the Canadian Tire Corporation, Ltd., operations eventually were integrated and performance improved after building a KMS and portal interface on an intranet (Smith 2008). The timeline below shows the transition:

- Before 2008—Canada Tire dealers were mailed daily and weekly reports.
- 2008—intranet service called TIREnet in use for product information.
- 2008—TIREnet interface redesigned and a Microsoft Office SharePoint Portal Service (c) set up to help distribute merchandise information, to determine access, and to share knowledge about products with appropriate staff (Smith 2008).
- 2008–2010—over 30,000 documents transferred to new system.
- 2010—new search interface supports knowledge retrieval and decision making based on current information

Going beyond tires, Canadian Tire Corporation, Ltd. wanted to add markets to support sales of home products, sports equipment, and apparel. Information, however, was distributed slowly by paper mail and later using a hard-to-navigate interface. Although over 30,000 documents had to be converted in a low-risk process, the demand for faster access to information grew (Laudon and Laudon 2012). Aligning with the business strategy to make information available quickly, a new/redesigned KMS portal was proposed. A causal network that illustrates this alignment is illustrated in Fig. 3.

By building an intranet portal to inform retail outlets and dealers about opportunities and changes, the knowledge-based system called TIREnet improved communications and accelerated profits. Results, for example, showed savings over $1 million in publishing and distribution of paper. The following matrix illustrates the Analyzer approach to strategy alignment at Canadian tire (Table 5).

Archiving and gleaning data meant that not all information remained in the Canadian Tire knowledge base.

Strategy alignment meant a KMS to support data review, information updates, and continued accessibility. In order to share knowledge efficiently, the Analyzer approach led to the low-risk concept that a new interface had to be designed. By applying Microsoft (c) SharePoint and other tools, strategy goals of both the business and KM were met (Microsoft 2010). Eventually, the differentiated

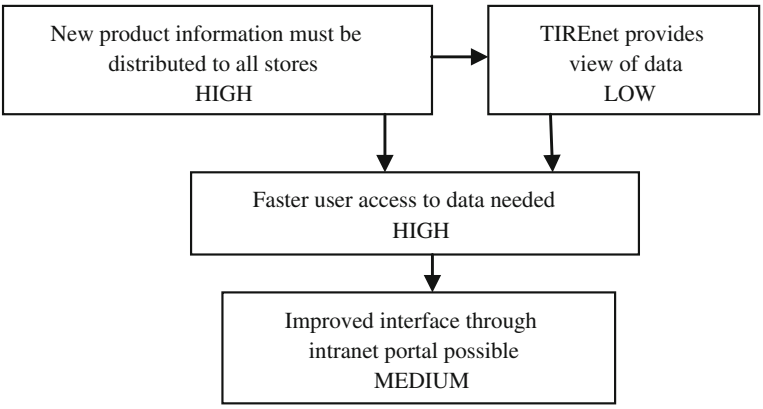

Fig. 3 Causal network for transitional analyzer

businesses within Canadian Tire became integrated in a KMS that supported new profits and market growth for the transitional e-business seemingly based on successful strategic alignment.

Looking at KMS in transitional organizations that use the web and computer-based tools suggests that alignment varied with approaches to risk management, which helped determine e-strategist type. Overall, their e-business efforts also seem to set examples and to have forced competitors to transition also. In the next section, we summarize our research on more advanced m-commerce businesses.

2.4 Case Studies of Advanced m-Commerce Businesses

With the development of social networks, mobile applications, and cloud-based networks, the rapid growth and changes in m-commerce or mobile technology may have affected the requirement to align business and KM strategies. Preliminary research suggested that both internally developed and independent or vendor created changes can impact e-business strategies. Many companies and organizations involved in manufacturing and product services, for example, have developed KMSs to utilize social networking. Participants not only include primary stakeholders such as employees, managers and executives, but also more than before the customers where advanced m-commerce is utilized. For example, they are applying the real-time value and convenience of mobile apps and cloud technology to distribute data and make knowledge bases openly accessible. The preliminary case studies in this chapter provided KM business models and suggested possible adjustments to our alignment taxonomy.

We collected historical data about KM applications in companies and organizations that were e-based in one or more market segments and very dependent on m-commerce and advanced technology, such as mobile apps, for sales or communications. Data collecting involved international searches using e-journals, web

Table 5 Classification matrix for transitional analyzer

Categories	Analyzer
Business strategy	Risk is low as original documents existed and an early KMS set up (TIREnet)
	With new interface design increasing access on intranet and speed, product offerings would grow
KM strategy	Approach to new interface using Microsoft SharePoint efficient
	Improving access with portal makes KM more flexible and shows knowledge base useful
Operation implementation	E-business approach to all the products indicates early differentiation
	In the end, integration of KMS with better interface tools supported aligned business and KM strategies

sites and blogs as well as books, published articles, case studies, and reports. The case studies presented here show an emphasis on mobile apps, but research also included studies of social networking and cloud applications in diverse industries, businesses, and organizations.

The three sample cases of mobile app development showed strategic alignment of KM and business strategies as we discovered using methodological research and qualitative data analysis. The case studies presented illustrate all three strategist types: a banking/finance application (Defender); a free, mobile app with connections (Prospector); and a shopping app from a manufacturer of high-performance, outdoor footwear (Analyzer).

2.4.1 E-based Defender Organization

Finance and banking companies were early adopters of mobile app technology. The first examples of mobile apps for business appeared in 1997 in Finland; consumers used SMS texting to acquire Coca-Cola products from vending machines and to allow banking with Merita Bank using a phone. These applications indicated the birth of mobile commerce ("m-commerce") to later observers and researchers of early adopters (Laukkanen and Pasanen 2008). In comparison, early unsuccessful systems with microcomputers and video-texting in the US and UK were costly and had few services (Wright and Howcroft 1995).

Looking at international financial institutions, technological innovation can seem slow and conservative suggesting a Defender type strategist as part of the business culture. However, Merita Bank (now part of Nordea) showed early adoption of computer-based banking. Internet banking seemed to require a change in business strategy based on timing, past history with resources, and identifying a path for change (Hulten et al. 2002). Identifying the path from old to new technology illustrates business and KM strategic alignment. The success of the first banking m-commerce led to banks in Europe and the US adopting mobile apps and services. Retaining traditional banking strategies while developing new channels for customer relations, such as the Internet, may be the best approach compared to

e-banking alone (Hulten et al. 2002). Can banks and financial institutions increase customer retention and lower costs by transferring labor to customers with more accessibility to knowledge bases? A brief history of Merita/Nordea as a Defender strategist type suggests that it is possible (Hulten et al. 2002 and http://www.nordea.com web site accessed August 5, 2012). The following timeline summarizes the historical documents:

- 1982—distance banking started at Merita (telephone bank service)
- 1984—PC connection opened for private Merita customers at work
- 1988—e-banking for equity dealing supported at Merita; Nordbanken starts telephone banking project
- 1992—Merita offered mobile telephone bank services
- 1996—Merita launched Internet bank services (balance, payment, transfer, equity dealing and e-shopping)
- 1996—merger of Sweden's Nordbanken and Finland's Merita
- 1997—Merita launched mobile app banking with WAP (Wireless Application Protocol) and SMS text messaging.
- 2000—MeritaNordbanken offers services for paying bills and electronic invoice approval via a WAP telephone
- 2000—MeritaNordbanken recognized for Best Online Strategy by The Banker magazine
- 2001—Nordic Ideas became "Nordea" (brand adopted by Nordbanken and Merita)
- 2002—3.3 million e-banking customers
- 2003—begin 10-year outsourcing agreement with IBM
- 2004—Nordea ranked biggest Internet bank measured by payments with 4 million Internet services customers
- 2011—Nordea implements value-chain business strategy to become more flexible and to increase focus on capital and cost efficiency

Merita has been an early adopter of technology. The corporation seems to have promoted a culture willing to add distribution channels using new technologies while retaining conservative banking strategies. The bank saw changes in access devices as part of their value-adding strategy based on customers creating new habits and the bank transitioning technology more easily (Hulten et al. 2002). One causal analysis network (Fig. 4) illustrates the strategy.

By introducing a mobile application for banking, Merita could keep costs low and retain its distance banking customers who were already used to computer-based banking. M-commerce project developers at Merita seemed to build on customer skills and to keep costs low. In comparison, the banking project at Nordbanken in 1990 required costly equipment, started slow with little branch promotion, and required call center employee hiring; that project's problems led to economic difficulties (Hulten et al. 2002). However, the later alignment in strategies at Merita seems based on a value-add approach and supports knowledge sharing across organizations (Table 6).

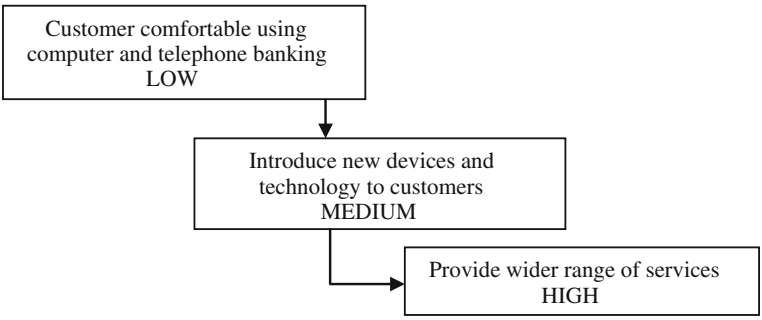

Fig. 4 Causal network for e-based defender

Table 6 Classification matrix for e-business defender

Categories	Defender
Business strategy	Improve business process for distance banking with mobile app; retain customer control
KM strategy	Launch efficient project to give customers access and increase knowledge base
Operation implementation	Use mobile apps to grow market Decrease costs with fewer bank tellers Satisfy customer demand for more access

Even with customers using mobile apps, banks control customer access. Digital data technology and tools can provide information for knowledge bases and for making decisions about expanding technology. Such a KMS seems to have been used successfully at Merita. As Defender strategists, banking organizations can minimize risk, save money and improve technology by building on knowledge and information about customers from e-based business. Industry analysts and researchers suggest that demand for mobile apps seems strong among youth customers (Temenos 2011; Laukkanen and Pasanen 2008), but also it is growing among corporate executive customers (Darsow and Listwan 2012). Successful m-commerce in banking corporations like Merita illustrates the impact of aligning KM and business strategies.

2.4.2 E-based Prospector Organization

A Prospector strategist may be very similar to a Defender in the high-tech context of mobile apps, social networks and cloud network distribution. However, while Defenders use improved business processes to control customers and reduce risk with knowledge, Prospectors use m-commerce investments to find new business opportunities. They also may be even more flexible with knowledge resources. The case of Spring Partners shows how the prospector environment, especially for

entrepreneurs, supports strategy alignment while seeking innovations (Anthes 2011). Our timeline shows such investing in research and development:

- 2008–2009—investors launch Spring Partners and first product is Springpad, a web-based service for saving personal digital information.
- March, 2010—40,000 customers use web site and traditional product marketing for stores.
- By end of 2010, mobile apps marketed in Apple App Store for iPhone and iPad; in Google Android and Chrome web stores.
- 2010–2011—reorganize company to focus on app store ranking and public relations.
- 2011—native applications running in various mobile and web operating systems and connected to services, such as Facebook.
- 2011—using cloud service from Amazon (no in-house data center) (Atkinson 2011).

As a software company, Spring Partners continues to supply apps for free. Their revenue is based on consumer use of what is saved, for example, buying books based on stored information (Anthes 2011). Causal analysis tracked different strategies and non-traditional approaches used by Spring Partners. The causal network in Fig. 5 illustrates how the CEO applied knowledge to improving app store rankings for products and to avoid being lost amongst the competition. In 2011 he said that "everything we do, whether product development or business development, is focused on getting ranked as high as possible" (Anthes 2011):

Seeing an opportunity to port software as a native application for the mobile app market, Spring Partners added smart phone distribution. Facing competition in online stores, the company focused research and development on customer rankings. Innovation helped to define the Prospector strategy of the company (Table 7).

The KMS in such a small company as Spring Partners (less than 20 employees) is flexible enough to change quickly as the CEO changes focus and reorganizes employees. The Prospector strategist type of business can integrate knowledge and apply new technologies quickly in a competitive market while managing risk.

2.4.3 E-based Analyzer Organization

Looking to increase brand loyalty and to build customer interaction in the m-commerce marketing environment, Deckers Outdoor Corporation researched the consumers of its products. Managers and the vice-president of e-commerce determined that footwear consumers used mobile apps for shopping, especially for high-performance shoes such as they sold. Smart phone and tablet mobile applications seemed a good way to connect buyers with the brand (Atkinson 2011). Over the past three years, Deckers used an Analyzer strategy to keep risk low but to grow. Mobile apps supported sales increases with more customer interactions.

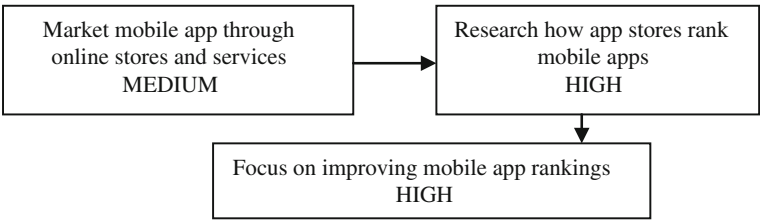

Fig. 5 Causal network for e-based prospector

Table 7 Classification matrix for e-business prospector

Categories	Prospector
Business strategy	Track number of users downloading and using product; manage risk
	Apply new technology and programming to grow
KM Strategy	Use data and knowledge of app stores beat competition; not flexible about high rank requirement
Operation implementation	Apply knowledge collection and sharing process across company
	Develop solutions immediately to impact public relations and rank
	Integrate business and knowledge for performance improvement

Our timeline shows how they integrated customers into a comprehensive KMS for marketing, development, production, and sales:

- Before 2009—use web site and traditional product marketing for stores.
- In 2010, conduct customer analysis and determine need to address changing trends in shopping with mobile apps.
- October, 2010—migrate first set of information from legacy platform.
- 2010–2011—develop 3 US and 5 international sites for multiple brands.
- 2012–present—develop 4–5 more sites for mobile use (Atkinson 2011).

As a design, manufacture and marketing corporation, Deckers illustrates how a traditional company is using e-based services to track customers who find out about products at store locations on their mobile devices. A vendor named Demandware was chosen to provide services (Atkinson 2011). The causal network in Fig. 6 illustrates the strategy alignment for a KMS to help corporate users as well as customers with mobile devices:

By using real-time technology and location-based mobile app systems, Deckers marketed its brand to potential customers in stores and advertised new product lines once apps were used. This form of KMS involves customers with company employees who are marketers, designers, product developers and sales persons. Such an alignment is strong and sustained through feedback and continued use (Table 8).

This case shows the strategic need to address changes in buying trends affected by online analysis of prices and features. Deckers determined that mobile apps provide a low-cost, low-risk growth technology on which to build a comprehensive

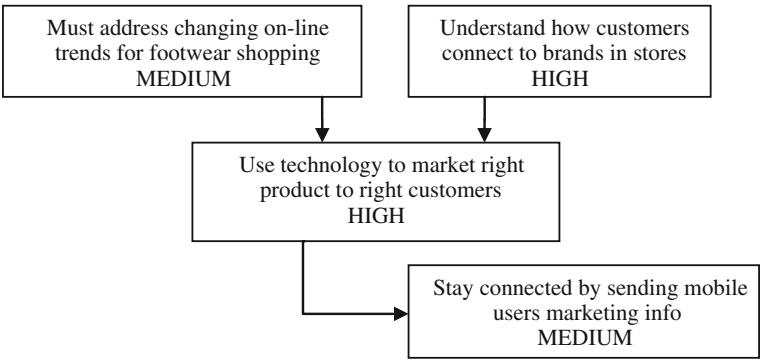

Fig. 6 Causal network for transitional analyzer

Table 8 Classification matrix for e-business analyzer

Categories	Analyzer
Business strategy	Keep marketing risk low through technology and grow by increasing customer interaction and support brand satisfaction
KM strategy	Rollout comprehensive system to collect location data on footwear customers and to increase consumer interaction
Operation implementation	Combine business and KM strategies with mobile apps providing real-time data and consumer responses quickly (for both marketing and product design information)

KMS for the corporation and the consumers. Such knowledge sharing has brought customers into the manufacturing process. The KMS takes advantage of the ubiquitous presence of mobile apps in malls and stores. Analyzer strategists can grow globally as they protect current market share. Feedback and interaction in such m-commerce solutions help make products current and may keep customers attached to brands. The KMS improves business and KM processes by using real-time data on products and providing feedback based on consumer interaction, thus aligning KM and business goals.

2.5 Discussion

Organizations that began as web-based companies or as early internet product users do not necessarily have traditional business strategies; however, they often align profit goals with KM during internal and external KMS development. Our preliminary, qualitative research suggests that business goals and comfort with risk have not been altered by new technologies and that alignment remains part of successful KMS design and implementation. However, the results section will

describe the impact of technology and some changes. Recommendations highlight procedures for practitioners who want to align strategies when developing a KMS.

Following our earlier case study analysis of traditional businesses (Swain and Booto 2008), a qualitative methodology was used again in the research presented in this chapter. Analysis suggests that a KM alignment strategy can be applied in transitional e-businesses. We discovered examples of success in all three types of strategist-type environments (Defender, Prospector, and Analyzer) in both transitional e-businesses and in advanced e-based businesses or m-commerce cases. Thus, our taxonomy for KMS alignment seems to continue to be applicable and helpful to businesses and organizations as technology continues to evolve.

Our historical data collection based in business literature on companies, organizations, and e-businesses shows how strategic alignment for KMSs can involve marketing, delivery, and feedback on the web. Additionally, mobile apps using smart phones or notebooks that might utilize cloud-based data structures and social networks succeed as part of a KMS when KM and business strategies are aligned. Case studies of different companies and organizations were reviewed, and details of the qualitative data analysis were presented in this chapter for six cases. Results suggest that strategic alignment is prevalent in current KMS development.

Expanding the scope of theory-validation research for our strategist-typing taxonomy, future studies might be done to investigate more case studies. Furthermore, "failures," such as the quality of data impacting analytics for Emergency Medical Associates (EMA) and the credibility of its data warehouse (Howson 2008) could be researched. Our case study research provides support for proposing a KMS that reflects strategic alignment. In addition, refining a KMS to include customers in m-commerce (and possibly e-business) can be part of systems development. In addition to researchers, we recommend the following procedures for practitioners to align business and KM strategies based on type.

3 Recommended Procedures for Practitioners: How to Apply Strategic Alignment Model and Concepts to KMS Development

The following procedural details for implementing a strategy-based KMS are based on our qualitative research of strategic alignment efforts in organizations. The first stage for practitioners involves determining *what* knowledge will be defined. Specific steps show how to use the strategist-type conceptual framework to define actors, processes, and actions when building a KMS operation. The second stage involves determining *who* will be using the KMS and the predominant strategic type of these stakeholders (Defender, Prospector, or Analyzer). An important step during this stage is to identify the strategic characteristics of users and managers who define strategies and who must perform interactions associated with knowledge. As illustrated, both product managers and knowledge managers

are good examples of significant stakeholders as they determine goal alignment and interaction in an organization. However, in order to implement our suggested taxonomy, other actors also must be involved if they determine processes and actions. People throughout the organization who contribute information, analyze knowledge, and make decisions can be involved.

3.1 Audience for Procedures: Practitioners

The chosen approach provided here for KM business practitioners is a *strategic alignment* model based on developing a KMS that is aligned with strategic business plans. Although it is not easy to undertake strategic alignment of KM and business strategies (Asoh et al. 2003), we offer a theory-based approach using three types of strategists (Defender, Prospector, and Analyzer). The theory was validated by case study research and the historical data/qualitative methodologies described above.

3.2 Steps in Procedure for Practitioners

Step 1 (What Knowledge): Review your short, average and long-term objectives for better performance. Then ask: how are these objectives defined according to the type of business strategist that you and/or your company have adopted? Your business performance goals can be reached by using KM, but different process, KM, and performance factors should be considered (see Table 9). Moreover, the organization may determine that it wants to emphasize one particular factor, a precise set of certain factors, or all of the value factors.

Step 2 (Who Defines Strategy): Determine the types of organizational business strategies with the managers and users or your chosen approach as a strategist, researcher or knowledge-based decision maker. Choose from one of these classical strategist types your approach to business strategies for the organization:

- Defender
- Analyzer
- Prospector

Your choice may reflect your organization's current views of different processes as well as your nature and comfort with risk. Strategist type may change later as experiences, strategic results, technologies, and global markets impact you. Furthermore, you might use all three approaches or blend them for different business concerns within your organization. Technology and market changes are often triggers for a strategist's choices (see Table 1 and discussion of research and

Table 9 Summary matrix for alignment of business and KM strategies by type

Strategist type	Business process	KM strategy	Org performance
Defender	Control customers by improving business processes with low risk	Be efficient with KM	Differentiate: Grow the market, decrease cost, satisfy customers
Prospector	Seek opportunities from innovation and investment in R&D; manage risk	Be flexible with knowledge resources	Integrate: Use new technology
Analyzer	Reduce risk and increase growth	See KM resources as comprehensive	Combine strategies

validation after the table for examples and more detailed explanations of the roles that have been analyzed and supported in our case studies).

Step 3 (Alignment): Before launching a knowledge management project or using KMS tools, match your specific business processes, risk level, performance objectives and strategy types with the primary KM strategist type. That is, to improve the results of implementing your KMS, complete the linking for alignment of strategies. You can use the simplified Table 9 to match a business strategy with the appropriate KM strategy. This alignment process is designed to help you improve aspects of organizational performance needed to reach economic goals through appropriate strategies for KM.

4 Recommendations

Knowledge managers have argued since the 1990s that a KMS can increase customer knowledge, improve customer service, and increase customer loyalty if information and knowledge is made available throughout the organization (Cooper et al. 2000). Transitional e-business efforts involve putting web-based information on hand-held devices and distributing books, music, games, and videos. More recently many businesses are utilizing e-based technology on smart phones and notepads. They seem to be making "m-commerce" the fastest growing market segment on the globe. This chapter suggests transitional e-businesses use risk management strategies to support knowledge sharing among many stakeholders, and any m-commerce KMS include customers to increase business.

That is, when aligning business strategies with KM strategies where mobile apps and social networks are so ubiquitous, e-businesses and organizations have expanded knowledge sharing to include customers. M-commerce businesses even support user-generated materials and interact with empowered customers to develop or customize products and services. Such sharing was not as easy for traditional and transitional e-businesses before mobile technology evolved.

Thus, a continued need to align strategies for business and KM seems to remain strong. However, further research on alignment is recommended to track changes

in business models and KMSs as user demographics change. In 2010 studies found that young adults will continue to outnumber adults as users in the US, for example, where 44 % of app-users were 18–29 years old (Greengard 2010). As users of all ages embrace mobile apps and social networks, will strategic alignment needs change? In case studies researched, mobile or m-commerce and location-based apps provided new platforms for social networking, and among youth they were proven to influence buying (Taylor et al. 2011).

4.1 Processing Results

Using a theoretical approach to the development of a conceptual framework, this chapter has presented research and procedures on aligning strategies and improving organizational performance. Also, by showing our original *KM/BS Alignment* model (Booto and Swain 2008) in the context of specific projects that both succeeded and failed to align their KM and business strategies, we offer researchers and practitioners ideas for further research and applied use. We do not suggest that final proof has been given with our most recent case studies; however, we have found more support and verification of the need for alignment in e-business and m-commerce applications. In addition, we suggest that the procedure for implementation involving concepts, actors, actions and processes has been proven to be appropriate in traditional businesses, non-profits and government organizations, as well as in web-based and smart phone environments. The conceptual framework of Defenders, Prospectors, and Analyzers remains useful when developing a KMS.

Applying this alignment conceptual model requires the individual, business or organization to identify its strategic character. Is it being a Defender of an existing standard product, a Prospector in a new market or technology, or an Analyzer seeking new markets with just the risk as an established product? All are successful strategies in different contexts.

Can alignment help improve strategic planning and the use of knowledge in decision making? Depending on the business and the strategist type, the implemented KMS can support appropriately efficient, flexible and comprehensive interactions associated with knowledge sharing. Both product and knowledge managers can use case studies to promote strategic alignment, which supports improving operations and meeting goals. Researchers can investigate further organizational use of KM to show the extent to which performance objectives and risks are met by appropriately aligned business and knowledge strategies. They may also identify the impact of technology in sharing knowledge in web-based portals, intranet implemented knowledge bases, or applications that bring customers, suppliers, and producers together in a social network.

4.2 Making Recommendations

When researching both transitional and m-commerce e-businesses, four considerations were used in the analysis of case studies: the changing role of business-to-business models, the level of risk preferred, the importance of customer involvement in the KMS, and the rising importance of small businesses. Research from a case study of a large Indian business (Rod et al. 2009) suggests that concerns for balancing knowledge sharing and knowledge protection have changed. Also, development has become faster so that university partnerships can be too slow for a large company but partnerships with outsourcing companies are more practical.

Building on such research, advances in technology may make cloud data and mobile app users seem to follow more of a B2B approach to information sharing. Customers can become partners through interactive, knowledge-sharing technologies. However, the size of many m-commerce businesses is relatively small and perhaps more supportive of knowledge sharing with universities and research organizations compared to large businesses (DiPasquale and McInerney 2010). The case studies in this chapter show how business strategy alignment with KM seems to adjust to technology and continues to follow the alignment model that defines three types of strategists (Defender, Prospector, and Analyzer).

Looking at the defender, analyzer, or prospector approach to strategy can provide context and direction when analyzing case studies. Impact on the model for aligning traditional business and KM strategies was also part of the analysis. As Scarso and Bolisani (2010) have suggested, the development of knowledge-based strategies in knowledge intensive service businesses may lead to new models that integrate knowledge into traditional, strategic frameworks. Whereas those authors suggest integration and adaptation of Porter's competitive strategies model and the Holsapple and Singh knowledge chain, they continue to recommend explorative analysis and support models for descriptive classification and managerial tools (Scarso and Bolisani 2010). Similarly, this chapter integrates e-business into a taxonomy for alignment of KM and business strategies. However, we also show how a matrix-based model might be used to plan alignment of strategies based on the business environment, strategist type, and technology.

Most businesses measure success or failure of KM on improved business performance and meeting strategic goals (Howson 2008). Business performance can be measured quantitatively, but the value of strategic goals can also be measured qualitatively. This chapter provides supporting research and procedures to align business and KM strategies, which vary according to the type of strategists in the organization. For e-businesses, the result of alignment can be success in both organizational and KMS performance. Involving stakeholders and even customers, when determining risk levels, can be part of strategic alignment. Future research might include quantitative analysis of Defenders, Prospectors, and Analyzers as e-businesses adopt new technologies and m-commerce customers increase participation in the KMS.

Appendix

For case study research, historical data about KM applications were collected from textbooks that trace changes in revised editions, business books, journal and newspaper articles, published case studies, and reports about organizations. In addition, researchers used e-journals, web sites and blogs as well. The case studies were classified into two kinds of e-businesses:

Transitional e-businesses

- Alltel
- Boeing
- Canadian Tire Corporation, Ltd.
- CIGNA
- Coca-Cola
- Dunkin' Donuts
- Emergency Medical Associates
- Expedia (travel)
- General Motors
- Hewlett-Packard
- MenuVino, Inc.
- Montgomery County Schools in Maryland (USA)
- Texaco Oil
- Valero Energy
- Xerox

M-commerce businesses

- Amtrak
- Bank of America
- Boy Scouts (USA)
- British Broadcasting Co.
- Carrefour (France)
- Chase
- Deckers Outdoor Corp.
- Delta Airlines
- HBO
- ICICI Bank (India)
- Mercedes-Benz
- Merita Bank (Nordea Bank)
- New York Times
- Nokia
- Wollongong University (Australia)

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Information Systems Outsourcing, the Umbrella Term for e-Business Strategic Management Sourcing: Service Comparison

Ricardo Martins and Tiago Oliveira

Abstract In the business research literature, e-business is considered to be a type of sourcing option of information systems outsourcing (ISO) if it is external to the firm and the renting supplier-owned resource delivers the solution over the internet. As the term "e-business" is conceptually included in ISO, this chapter seeks to investigate the factors that affect the adoption of ISO in general by comparing the effect across five business areas: human resources, finance, logistics, sales, and marketing. Based on the combination of a technology-organization-environment (TOE) framework and the diffusion of innovation (DOI) theory, the authors develop a conceptual model to study the determinants of ISO adoption by business area. This handbook chapter is one of the first to examine ISO adoption in these five business areas and to use a research model that combines the TOE framework and the DOI theory. Data collected from 261 firms in Portugal were used to test the proposed model. Based on a logistic regression, top management was found to be supportive and perceived benefits to be determinants of ISO adoption in all business areas defined. Moreover, other significant factors used to determine ISO included: complexity in human resources, finances and logistics; relative advantages for finance, logistics, and sales; firm size (logistics only); and competitive pressure for business areas (except marketing). Furthermore, attitudes toward change were found to have opposite effects—it is positive for sales and negative for human resources, finance, and logistics.

Keywords Information systems outsourcing (ISO) · Technology-organization-environment · Diffusion of innovations · Human resources ISO adoption · Finance ISO adoption · Logistics ISO adoption · Sales ISO adoption · Marketing ISO adoption

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1 Introduction

Information systems outsourcing (ISO) is the umbrella term that includes a range of options that are external to the firm (Sanders et al. 2007), such as business process outsourcing (BPO) (Lacity et al. 2009); the application service provision (ASP), which is defined as the renting supplier-owned resource delivering the solution over the internet; enterprise resource planning (ERP); customer relationship management (CRM); and all types of e-commerce and e-business, amongst others (Kern et al. 2002). Although in many articles it is common for e-business to be considered the same as e-commerce, the fact is that e-commerce is concerned only with the exchange of goods of financial value, while e-business denotes more general dealings or commercial activities, including operational activities and logistics (Jones et al. 2000). ISO is considered a strategic initiative that enables firm innovativeness through the creation of value networks (Lacity et al. 2010; McFarlan and Nolan 1995; Quinn and Hilmer 1994). Because the decision to outsource an e-business project has significant influence on a firm's ability to balance competing needs, to deploy its best talent, and to prevent leakage of knowledge embedded in assets (Agrawal et al. 2006), this chapter offers guidance on decision making and recommendations for outsourcing any information systems. Also because of rapid changes in technology and ISO activities, both practitioners and researchers must include ever more—and ever more specific—factors in order to understand ISO (Grover et al. 1996). Furthermore, according to IDC the value of ISO in Portugal is 0.66 % of the GDP, and according to the same source this value is much lower compared to the European average (1.47 %) (IDC 2006). Therefore, it is imperative to understand the factors that can most affect its adoption. This chapter seeks to advance researchers' understanding of the determinants of ISO adoption in the different firms' areas, such as human resources, finance, logistics, sales, and marketing. As a result, managers' and academics' future studies can focus on different features of the knowledge used to make ISO decisions. We developed a conceptual model based on the technology-organization-environment (TOE) framework (Tornatzky and Fleischer 1990) and the diffusion of innovation (DOI) theory (Rogers 1995). And to the best of the authors' knowledge, this is one of the first studies to examine ISO adoption in the five business areas, using the conjunction of models proposed. We tested the developed model using survey data from 261 firms that operate in Portugal.

The chapter is organized as follows: First, we present the theories and literature review, and then we describe the research model and hypotheses. Secondly, we describe the research model and hypotheses. Thirdly, we discuss the results of the estimate and tests for the developed model. Finally, we present the main conclusions, including practical limitations and specific suggestions for applications in business firms and future research studies.

2 Literature Review

As the literature reports, creativity and innovation are stimulated by multidisciplinary teams operating outside conventional organization structures (Agerfalk and Fitzgerald 2008; Garvin 1993; Goldman and Gabriel 2005; Inkpen 1996; Leonard-Barton 1995; Nonaka 1991). Since ISO falls into a similar category, we propose that the TOE framework provides a good model to understand the determinants that affect its adoption, because, beyond the features already mentioned, it has many consistent empirical supports (Wang et al. 2010), and is widely regarded as extremely useful in explaining the adoption of technological innovations (Chau and Tam 1997; Gibbs and Kraemer 2004; Oliveira and Martins 2010b; Xu et al. 2004; Zhu et al. 2006). The TOE framework comprises three distinct contexts: technological, organizational, and environmental. The technological context covers the internal and external technologies relevant to the firm, which include current practices and the internal equipment of the company (Starbuck 1976), as well as the technologies that are available externally (Hage 1980; Khandwalla 1970). The organizational context refers to the descriptive measures of the organization, such as its scope and size (Oliveira and Martins 2011; Tornatzky and Fleischer 1990). Finally, the environmental context corresponds to the constraints and opportunities for technological innovation, which include the various actors that may impact the decision process, such as regulators, customers, and suppliers (Tornatzky and Fleischer 1990).

The process of innovation in an organization is quite complex. The number of individuals involved and their attitude to innovation could mean that not all opinions converge in the same direction during the decision process (Oliveira and Martins 2011). As the decision on innovation is seen as a mental process through which an individual first approaches the idea of innovation and then develops an attitude toward it, diffusion plays an important role since is a special type of communication, and the spread of new ideas essentially consists of the creation and sharing of information between participants in achieving a common understanding (Rogers 1995). The DOI theory, developed by Rogers (1995), is related to the organizational innovativeness, which is composed of the individual leaders' characteristics, the internal characteristics of the organizational structure, and the external characteristics of the organization. Individual (leader) characteristics describe the attitude toward change; internal organizational structure characteristics describe their degree of centralization, complexity, formalization, interconnectedness, organization slack, and size. There is a similarity between some of the factors that comprise the DOI theory (Rogers 1995) and the TOE framework (Tornatzky and Fleischer 1990), such as complexity and firm size, which are described further in this chapter. Finally, external environment describes the external characteristics of the organization with regard to the system openness (Oliveira and Martins 2011).

3 Research Model and Hypotheses

We considered four contexts based on both models presented above: technology, organization, and environment from the TOE framework (Tornatzky and Fleischer 1990), and individual (leader) characteristics from the DOI theory (Rogers 1995). The two models are considered to be consistent (Zhu et al. 2006a, b), and are the most widely used firm-level adoption models (Wang et al. 2010). All hypotheses are presented below.

3.1 Hypotheses

The research literature indicates that firms may be less likely to adopt an innovation or technology if it requires a high level of new skills for their employees (Beatty et al. 2001). Since complexity is the degree to which a given innovation is perceived as being difficult to understand or use (Beatty et al. 2001; Corrocher 2003; Rogers 1995), and leads to resistance resulting from the lack of skills and knowledge (Rogers 1983), it could jeopardize the adoption of ISO. Thus, we propose the following hypothesis (Fig. 1).

H1. Complexity will have a negative effect on the adoption of ISO.

Relative advantage refers to the degree to which a particular innovation is perceived as being able to provide greater organizational benefit (Rogers 1983).

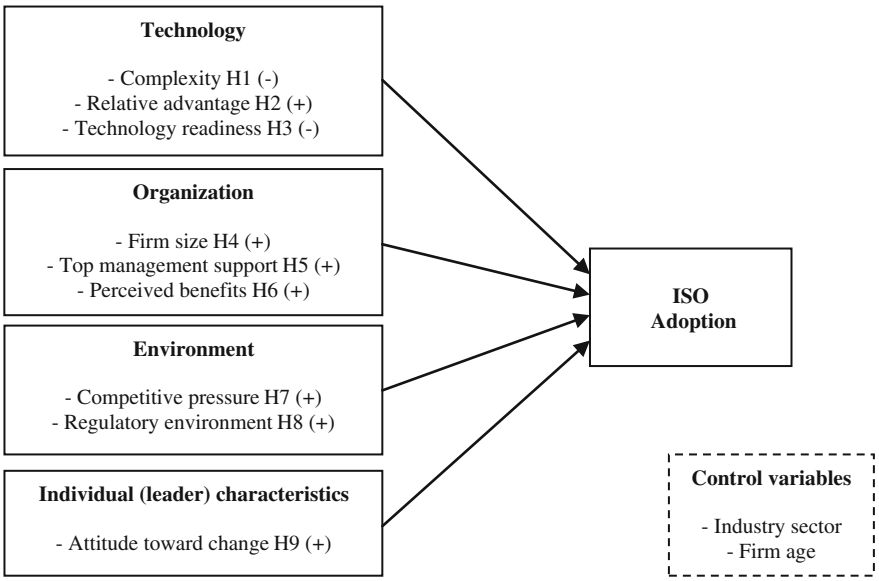

Fig. 1 The conceptual model for deciding on ISO adoption

This variable has been identified as a significant driver for IT innovations usage (Iacovou et al. 1995; Premkumar et al. 1994). Furthermore, the literature reports a positive relationship between relative advantage and IT/IS adoption (Tornatzky and Klein 1982). Thus, the following hypothesis is also proposed:

H2. Relative advantage will have a positive effect on the adoption of ISO.

Technology readiness reflects the physical assets, the human resources (Mata et al. 1995), the IT professionals within the organization who have expertise to implement the innovation, and the IT infrastructure, such as installed technologies, systems, and applications (Ngai et al. 2007). Since ISO is the externalization of these assets (Loh and Venkatraman 1992a), this factor may have a positive influence in innovation adoption (Zhu and Kraemer 2005). In this study, we will assume that the higher the level of technology readiness of an organization, the less likely it will be to adopt ISO. Thus, we propose the following hypothesis on technology readiness:

H3. Technology readiness will have a negative effect on the adoption of ISO.

Firm size is an indicator of the firm's resources and an important factor that influences innovation adoption (Tornatzky and Fleischer 1990). It is defined as an organizational attribute to the diffusion of innovation (Rogers 1995), and is measured by the number of employees and the number of establishments (Cho 2006). The existence of a positive relationship between firm size and adoption of technological innovation has been detected. As larger firms are more likely to make this kind of investment (Majumdar 1995; Quadros et al. 2001; Zhu et al. 2003), the following hypothesis is proposed:

H4. Firm size will have a positive effect on the adoption of ISO.

Top management support has been identified in the literature as a factor that positively affects the adoption of technological innovation (Grover et al. 1996), providing the vision, support, and commitment needed to foster the desired environment for the adoption of innovation (Lee and Kim 2007). In fact, in almost all innovative endeavours, top management support is extremely important (Beatty et al. 2001), and it will help focus efforts toward the realization of organizational benefits and lend credibility to functional managers responsible for its implementation and use (Bradford and Florin 2003). Since ISO is seen as a strategic decision (DiRomualdo and Gurbaxani 1998), this factor can positively affect the adoption of innovation, creating an environment of greater convergence of ideas (McGowan and Madey 1998). Therefore, we propose the following hypothesis:

H5. Top management support will have a positive effect on the adoption of ISO.

Perceived benefits refers to the degree to which new technologies provide more benefits than do old ones (Lin and Lin 2008). This variable has been shown to impact technology adoption (Banerjee and Golhar 1994; Oliveira and Martins

2010a, b). The firm must perceive that the adoption will either resolve existing problems or provide new business opportunities (Beatty et al. 2001), and capture the extent of agreement with claimed benefits relative to its local condition (Chau and Tam 1997). The following hypothesis on perceived benefits is proposed:

H6. Perceived benefits will have a positive effect on the adoption of ISO.

Competitive pressure is defined in the literature as the pressure resulting from a threat of losing competitive advantage (Lin and Lin 2008). It refers to the pressure of competition in the adoption of innovation (Gatignon and Robertson 1989). It is the industry in which the company operates that increases the likelihood of adoption of innovation (Kimberly and Evanisko 1981; Thong 1999; Utterbac 1974). The greater the competitive intensity, the greater is the technology adoption (Gatignon and Robertson 1989; Globerman 1975; Levin et al. 1987; Ngai et al. 2007; Oliveira and Martins 2010b; Teo et al. 2003; Thong 1999). Competitive pressure has been identified as an important determinant in the adoption of innovation (Gibbs and Kraemer 2004; Grover 1993). Firms can simply follow their competitors in order to respond to pressure, regardless of the expected benefits, based solely on their success (Teo et al. 2003). Increased competition makes firms feel the need to seek advantage compared to their peers, through innovation (Wang et al. 2010). Thus, we propose the following hypothesis on competitive pressure:

H7. Competitive pressure will have a positive effect on the adoption of ISO.

The regulatory environment is recognized as a critical factor affecting innovation. The more restrictive the regulatory environment is, the more it is that firms will be willing to delegate management to an entity outside of their organization. The constant difficulty of adaptation for legal requirements can have a positive effect on ISO adoption, so we propose the following hypothesis:

H8. Regulatory environment will have a positive effect on the adoption of ISO.

Attitude toward change describes the attitude of the leader (Rogers 1995). The role played by the leader determines the capacity for innovation (Cannon 1985), and may substantially influence the perception of innovation (Wejnert 2002). Thus, we propose the following and final hypothesis on attitude:

H9. Attitude toward change will have a positive effect on the adoption of ISO.

3.2 Control Variables

It is common to see the use of control variables in information systems studies (Zhu et al. 2006, 2003), since they are used to control the variation of data that were not captured by the explanatory variables. In this study, we need to control for industry sector and firm age.

4 Research Methodology

4.1 Construct Measures and Data Collection

Our construction of items of measurement for the study of ISO adoption takes into account the existing instruments. However, some of the items used were adapted to the context of ISO. Tables 1 and 2 summarizes all of the information about the items measuring the respective independent variables. Most items were measured using a five-point Likert scale ranging from "(1) strongly disagree" to "(5) strongly agree".

The technology readiness and firm size items were not measured by a Likert scale. Table 2 presents the items of these two variables.

The dependent variable, adoption, is dichotomous (0: non-adopter, 1: adopter). It was determined by asking respondents if their firms adopted ISO specifically for the following products: human resources, finance, logistics, sales, and marketing.

A group of experts was formed to analyse each question and suggest improvements for the writing and questionnaire structure. Based on the follow-ups, we reviewed some of the texts of our original research questions. After that, a pilot test was conducted. The pilot test provided the acceptable level of reliability required for all the items comprising the questionnaire.

The sample was obtained from a source list from Dun and Bradstreet, which is one of the world's leading sources of commercial information and insight on businesses. The sample was a random selection of firms from Portugal. In order to meet minimum standards for strata size class of firm, strata were to include a 20 % share of large firms (>250 employees), 40 % of medium-sized firms (50–250), and 40 % of smallest-sized firms (<50 employees). The survey was executed online, with an invitation for participation sent to several managers of the sample firms. The sample was of 600 firms. A total of 261 usable responses were completed, yielding a total response rate of 43.5 %. Table 3 shows the sample characteristics. About 80 % of the data were collected from owners, managing directors, heads of IT, and other senior members of IT, which suggests the high quality of the data source.

4.2 Instrument Validation

A factor analysis was applied in order to assess the construct validation of the measures. Based on factor analysis with varimax rotation (with other rotations the results are similar), eight factors were obtained with eigenvalues greater than 1. These eight factors explain 83.6 % of the total variance in the data. The Kaiser–Meyer–Olkin (KMO) test measures the adequacy of the sample. It returned a value of 0.87, revealing that the matrix of correlation is adequate for factor analysis (Sharma 1996). Table 4 presents only the loadings above 0.5. The results of the

Table 1 Measurement items on five-point Likert scale

Variables	Measurements items	Adapted from
Complexity	C1. Used complexity in integrating system	Grover (1993), Chang et al. (2007), Premkumar and Roberts (1999)
	C2. Complexity in developing the system process	
	C3. Degree of complexity in terms of work practices in operating the system	
	C4. Our firm interaction with the system is clear and understandable	Bradford and Florin (2003)
Relative advantage	RA1. ISO adoption will lead to cost reduction	Li (2008)
	RA2. ISO adoption will lead to transaction acceleration	
	RA3. ISO adoption will provide timely information for decision making	To and Ngai (2006)
	RA4. ISO adoption will increase the business opportunities	
	RA5. ISO adoption improves competitiveness	
Top management support	TMS1. Top management supports ISO adoption	Li (2008)
	TMS2. Top management support is aware of the benefits of ISO	
	TMS3. Top management considers ISO important for the organization	Beatty et al. (2001)
	TMS4. Top management encourages employees to use ISO	
Perceived benefits	PB1. ISO may help improve the performance of my firm	Yiu et al. (2007)
	PB2. ISO can save my firm time in managing their processes	
	PB3. ISO may offer a wider range of products to my firm	
	PB4. ISO may offer a greater number of services to my firm	
	PB5. ISO may offer good investment to my firm	
Competitive pressure	CP1. In our industry, ISO adoption is useful to allow competition	Chwelos et al. (2001) To and Ngai (2006)
	CP2. The leading firms in our industry are committed to the adoption of ISO	Li (2008)
	CP3. Percentage of firms in our industry using ISO	
	CP4. ISO is a strategic necessity to compete	
Regulatory environment	RE1. There is adequate legal protection for ISO	(Zhu et al. 2006)
Attitude toward change	ATC1. For me, the adoption of ISO is desirable	Lee (2009)
	ATC2. When I am confronted with information, both positive and negative, on a new technology, I favour the positive information	Gatignon and Robertson (1989)
	ATC3. Firms outside my industry are usually a better source of information about technologies than firms in my industry. ATC4. I think that using ISO is a good idea	

Table 2 Other measurement items

Variables	Measurements items	Adapted from
Technology readiness	TR1. Number of personal computers that are currently in use in my firm divided by the number of employees	(Zhu et al. 2006)
	TR2. Number of IT professionals located in my firm divided by the number of employees	
Firm size	FS1. Number of employees	Cho (2006), Gibbs and Kraemer (2004), Pei-Fang et al. (2006)
	FS2. Annual business volume	
	FS3. Number of factories	Premkumar and Roberts (1999)

Table 3 Sample characteristics $n = 261$

	Observation	(%)		Observation	(%)
Firm age			*ISO adoption*		
< 10 years	48	18.4	Human resources	86	33.0
11–20 years	74	28.4	Finance	99	37.9
21–50 years	93	35.6	Logistics	68	26.1
> 51 years	46	17.6	Sales	54	20.7
			Marketing	52	19.9
			Industry sector		
Respondent title			Manufacturing	73	28.0
Owner/proprietor	6	2.3	Commerce	35	13.4
Managing director/board member	112	42.9	Services	121	46.4
Head of IT	8	3.0	Construction	20	7.7
Other senior member of IT	7	2.7	Health	12	4.5
Strategy development/organization	74	28.4	*Employee number*		
			<50	99	37.9
Other	54	20.7	50–250	108	41.4
			> 250	54	20.7

items that load higher than 0.50 on their associated factors corroborate the convergent validity of the factors (Chau and Tam 1997). The eight factors found were easily interpreted, they are: perceived benefits (PB), relative advantage (RA), top management support (TMS), complexity (C), technology readiness (TR), firm size (FS), attitude toward change (ATC), and competitive pressure (CP). These results are in accordance with the literature review.

In short, the measurement instrument is valid and reliable, and it can be used to test the proposed research model.

Table 4 Factor and validity analysis

Variable	Perceived benefits (PB)	Relative advantage (RA)	Top management support (TMS)	Complexity (C)	Technology readiness (TR)	Firm size (FS)	Attitude toward change (ATC)	Competitive pressure (CP)
PB1	0.755							
PB2	0.843							
PB3	0.848							
PB4	0.836							
PB5	0.836							
RA1		0.764						
RA2		0.776						
RA3		0.791						
RA4		0.859						
RA5		0.820						
TMS1			0.862					
TMS2			0.864					
TMS3			0.872					
TMS4			0.837					
C1				0.921				
C2				0.925				
C3				0.915				
TR1					0.994			
TR2					0.995			
FS1						0.896		
FS3						0.907		
ATC1							0.789	
ATC2							0.854	
CP1								0.909
CP2								0.687
% of variance explained	16.7 %	16.0 %	14.3 %	10.5 %	8.1 %	6.6 %	5.8 %	5.7 %
Cronbach's α	0.947	0.929	0.943	0.917	0.997	0.784	0.628	0.704

Note *C4, FS2, CP3, CP4, ATC3, and ATC4 question-items were excluded after factor analysis estimation due to low loadings (lower then 0.5). We presented only loadings with an absolute value greater than 0.5

5 Data Analysis and Results

Overall results point to practical ways to apply the model and make decisions based on specific areas. After the measurement instrument was validated and the dichotomous characteristics of the dependent variables defined, a logistic regression was applied to test the research hypotheses in the five ISO products, i.e., human resources, finance, logistics, sales, and marketing. Specifically, we began analysis by checking the multicollinearity, for which we calculated the variance inflation factor (VIF). The VIF ranged from a low of 1.05 to a high of 2.04. The values are below the threshold of 10, indicating that there is no problem of multicollinearity amongst the variables (Hair et al. 1998).

The goodness-of-fit of the five regressions were assessed in three ways. Firstly, to analyse the joint statistical significance of the independent variables, we computed the likelihood ratio (LR) test, which is statistically significant (p value < 0.01) for five regressions. This implies a strong relationship between the dependent and independent variables for all regressions. Secondly, we used the Hosmer–Lemeshow test (Hosmer and Lemeshow 1980; Lemeshow and Hosmer 1982), which reveals that there are no differences between fitted values of the model and the actual values for all regressions (p-value is 0.69, 0.22, 0.70, 0.51, and 0.54, respectively for human resources, finance, logistics, sales, and marketing). Finally, the discrimination power of the model was evaluated in two ways. We used the area under the curve (AUC), which varied from 0.74 to 0.84 (see Table 5), revealing an excellent discrimination (Hosmer and Lemeshow 2000). Also, the corrected classifications of logistic regression varies from 75.3 to 83.4 % (Table 5). The adoption by random choices ([adopters/(adopters + non-

Table 5 Logistic regression

Independent variables	Human resources (β)	Finance (β)	Logistics (β)	Sales (β)	Marketing (β)
Complexity	−0.489***	−0.307*	−0.396**	−0.244	−0.182
Relative advantage	0.042	0.476***	0.572***	0.424**	0.188
Technology readiness	−0.580	1.243	1.107	−2.602	3.043
Firm size	0.413	0.079	0.553*	−0.323	−0.149
Top management support	0.591***	0.781***	0.784***	0.643***	0.616***
Perceived benefits	0.841***	0.731***	1.031***	0.668***	0.741***
Competitive pressure	0.770***	0.786***	0.800***	0.879***	0.258
Regulatory environment	0.339	−0.151	−0.314	−0.349	−0.242
Attitude toward change	−0.318*	−0.351**	−0.364*	0.699***	−0.224
Goodness of fit					
Random choice (%)	55.8	52.9	61.5	67.2	68.1
Correctly classified (%)	77.8	75.7	78.8	83.8	78.4
Area under curve	0.83	0.82	0.83	0.84	0.74

Note β: standardized coefficients. *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$

Table 6 Summary of confirmed hypotheses

Hypotheses	Confirmed hypotheses				
	Human resources	Finance	Logistics	Sales	Marketing
Complexity H1 (−)	Yes	Yes	Yes	No	No
Relative Advantage H2 (+)	No	Yes	Yes	Yes	No
Technology readiness H3 (−)	No	No	No	No	No
Firm size H4 (+)	No	No	Yes	No	No
Top management support H5 (+)	Yes	Yes	Yes	Yes	Yes
Perceived benefits H6 (+)	Yes	Yes	Yes	Yes	Yes
Competitive pressure H7 (+)	Yes	Yes	Yes	Yes	No
Regulatory environment H8 (+)	No	No	No	No	No
Attitude toward change H9 (+)	No	No	No	Yes	No

adopters)]2 + [non-adopters/(adopters + non-adopters)]2) varies between 52.9 and 68.1 % for five ISO adoption, which is much less than in the case of our regressions. We, therefore, conclude that the five logistic regressions have much higher discriminating power than the random choice. The three statistical procedures reveal a substantial model fit and a satisfactory discriminating power, and there is evidence for accepting an overall significance of the five models.

The logistic regressions results are presented in Table 5. To test the significance of regression coefficients of the independent variables, the Wald test was used. As shown in Table 5, complexity was statistically significant for human resources ($p < 0.01$), finance ($p < 0.10$), and logistics ($p < 0.05$) business areas, and by the coefficients we see that it is negatively related. Relative advantage is positively and statistically significant for finance ($p < 0.001$), logistics ($p < 0.001$), and sales ($p < 0.001$) business areas. Firm size is only statistically significant ($p < 0.10$) for the logistics business area. Top management support and perceived benefits are positively related to all business areas ($p < 0.001$). Competitive pressure is positively related to all business areas ($p < 0.001$), except for marketing. Attitude toward change is negatively and statistically significant in the following regressions: human resources ($p < 0.001$), finance ($p < 0.001$), logistics ($p < 0.001$); contrarily, this variable is statistically significant for sales regression ($p < 0.001$). Finally, technology readiness and regulatory environment are not statistically significant for any business area.

Table 6 summarizes the hypotheses tested. Several hypotheses are supported: H1 for human resources, finance, and logistics; H2 for finance, logistics, and sales; H4 only for logistics; H5 and H6 for all business areas; and H7 for all business areas, except marketing. H9 is only supported for the sales business area. On the other hand, only two hypotheses are not supported for any business area (H3 and H8).

In the next section, discussion is based on the results of Table 6.

6 Discussion

The study identified the determinants of ISO adoption in different business areas, such as human resources, finance, logistics, sales, and marketing. Because ISO is an umbrella term that includes a range of sourcing options, we offer e-business recommendations and suggest how to use them, along with ideas for further research.

Based on the results of the study and the organizational context, we can recommend that implementation of decision making on ISO include top management support and emphasize perceived benefits (H5 and H6). These two are statistically significant facilitators for ISO adoption in all business areas. In addition, these findings are supported in literature (Cho 2006; Lee 2009; Pan and Jang 2008). These two factors are, therefore, the basis for the adoption of ISO, and all types of sourcing that are associated with it. Firms must perceive the clear and tangible benefits to adopt (Cho 2006), as the adoption of new technologies requires top management support (Lee 2009; Pan and Jang 2008). Secondly, and similarly noteworthy as determining factors, are the finance and sales business area. Using these factors could better position the providers of such solutions when submitting their offer(s), and we recommend that a similar methodology be applied for both areas. However, despite the similarities observed, substantial differences exist between the determinants when comparing the different business areas. We, therefore, recommend that managers, decision-makers, and future researchers apply the following determinants for each business area.

For the human resources business area, we suggest that top management support, perceived benefits, and competitive pressure be used in evaluating ISO. Perceived benefits are positively related with innovation adoption (Beatty et al. 2001), as well as top management support (Lee and Kim 2007) and competitive pressure (Wang et al. 2010). Complexity and attitude toward change were found to be statistically significant inhibitors because they affect ISO adoption negatively. This is an area that is very sensitive to business, as it has direct implications on employees, where a simple mistake could destabilize the normal function of company activity. Hence, the management of all processes between the supplier and the firm must be clear and simple in order to mitigate the risk of error. The attitude toward change will have a negative impact on the human resources business area, contrarily to what we had said initially. Also, firms see in the outsourcing of this business area a way to improve themselves, and focus on their core business. Complexity is negatively corroborated by earlier studies (Chau and Tam 1997; Low et al. 2011), as well as an attitude toward change (Illegems et al. 2001).

In finance and logistics business areas, we suggest that complexity, relative advantage, top management support, perceived benefits, competitive pressure, and attitude toward change be used in evaluating ISO. These variables have opposite effects, i.e., complexity and attitude toward change are inhibitors and top management support, perceived benefits, competitive pressure, and relative advantage are facilitators. Relative advantage significance was reported in earlier studies

(Li 2008), as well as the remaining factors, which were presented above. Despite the similarity, there is a difference with respect to the influence of firm size that is only statistically significant in the logistics business area. Earlier studies found that firm size facilitates innovation (Cho 2006). These findings indicate that managers for both business areas must apply practically the same methodology, taking into account the differences indicated above.

In the sales business area, we suggest that relative advantage, top management support, perceived benefits, competitive pressure, and attitude toward change be used in evaluating ISO. All these findings have literature support, as presented earlier. The fact that attitude toward change is positively significant in only the sales area could be related to the fact that this business area is more dedicated to outside actors (customers), and thus the individual characteristics assume a major role in the sales business area. This finding is very useful for suppliers, as they may focus their efforts on the individual (leader) characteristics and increase their chances of success.

The marketing business area was found to have the smallest set of determinants of all. We suggest that top management support and perceived benefits be used in evaluating ISO. The literature support for these findings was presented earlier. One possible explanation for this finding could be more restricted offers and knowledge about ISO in this particular area. Thus, it is important for suppliers to provide more solutions of this kind for this business area.

7 Theoretical Implications

In other studies about the adoption of ISO, the comparisons between business areas are missing. Thus, this chapter offers recommendations for areas of business when applying analysis of the value of ISO. As the rates of ISO adoption were lower than expected in the past, it is very important to understand the factors that affect it. As a result, business managers and decision makers may apply balanced perceptions of ISO in different areas and decrease, increase, maintain, or invert the situation. Based on the conjunction of the TOE framework (Tornatzky and Fleischer 1990), and the DOI theory (Rogers 1995), we offer our newly developed model for research to study the determinants of ISO adoption across the different business areas of firms. To the best of our knowledge, this study is one of the first to examine the adoption of ISO comparing the different business areas and using the combination of the two models. Despite the importance of all contexts not taking place in each business area alone, in general we found importance for all contexts. Although we found differences in the importance of drivers for ISO adoption in the different business areas, managers, decision makers, and researchers can apply appropriate forms of analysis of ISO using all H1–H9 areas respectively, except H3.

8 Conclusions

In recent years technology has continued to enable new sourcing models of ISO—such as application service provision (ASP), business process outsourcing (BPO), and cloud computing (Lacity et al. 2009; Lacity et al. 2010). However, the value rates of ISO in Portugal are still lower compared to the European average (IDC 2006), and in order to promote ISO adoption, it is essential to clarify the factors that explain this adoption, and make a deep analysis to see if different business areas have the same drivers.

In this handbook chapter, we propose a conceptual model with nine determinants for the adoption of ISO. We empirically tested our model in five business areas (human resources, finance, logistics, sales, and marketing). In general, our hypotheses are confirmed. Thus, our research model seems appropriate. Through the comparison of different business areas, we can see the statistically significant differences between them, as well as their similarities. Notably, top management support and perceived benefits are important factors in all business areas. Also, there is a clear similarity between the factors that affect the adoption of financial and logistics business area. Moreover, technology readiness and regulatory environment have no significance for the adoption of each business area. This means that it does not matter how well a firm is provided with information systems infrastructure and individual experts when making a decision on ISO adoption in the different business areas. Also, the rules imposed by business regulators are not sufficiently difficult to perform for a company to negate the adoption of ISO in the several business areas.

9 Limitations and Future Studies

The research supporting the use of the merged model is limited in some ways. Firstly, it is based on data from a single country, and the findings, therefore, may not seem sufficient to the entire international business community. To solve this limitation, future research might extend the study to other countries. Secondly, the study analysed only the adoption decisions, so for a better comprehension of ISO, it is suggested that future research focus on the stages of post-adoption, in particular the use and impact. Thirdly, for the study of the proposed model, the variables included in our team's view best pertained to the subject under study. However, for future research and implementation by managers, we recommend adding other variables in order to improve the understanding of the topic. Fourthly, since the studied term covered a variety of sourcing options, we encourage future, confirmatory studies of the model that can be applied in a more focused way to every type of IT adoption covered. Finally, in future research new sampling and analysis might be used to validate our model, such as analysing comparative samples between two specific types of industry.

In summary, the procedures to follow to implement the model are:

Step 1. *Provide top management with the need to outsource.* Give all the information that will help them realize the need for outsourcing of information systems. Naturally, when one intends to carry out this change, it is always for a better and a more innovative solution, justifying the change. But what often happens is that the top management is not sensitive to the current difficulties in the management of processes by their employees with current systems. And so they ask themselves: why change when the work appears done? Hence, there is a need to explain the current difficulties and that there may be benefits in terms of efficiency if the existing information systems are switched to outsourcing.

Step 2. *Formulate a comparative list of all the benefits offered by potential suppliers.* There are many solutions, and they differ. It is, therefore, important to choose the solution that meets the real needs of your company. This will be important in terms of process management efficiency and costs savings for the outsourcing solution.

Step 3. *See what your competitors do.* The best way to implement a successful outsourcing solution is to analyse what your competitors do. Given the difficulty inherent in this analysis, the best approach is to examine potential suppliers with outsourcing solutions already in place with your competitors and from there extract the best practices.

Step 4. *Analyse the degree of innovation* that outsourcing could lead to compared with existing systems, as well as the degree of complexity in its implementation.

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Organizational Websites Need Developmental Guidelines

Abeer A. Al-Hassan and Edgar H. Sibley

Abstract Researchers have made suggestions about the content of websites and tools have been developed to help in producing and maintaining them, but there is little commonality between the structure and content of the material presented on the many thousands of websites worldwide. Observing this led us to ask four questions: (1) What advantage does an organization hope to achieve when developing and maintaining a website? (2) Can these factors be used to develop a list of contents for an effective website? (3) Are some of these essential to a particular industry of website and why? (4) What advantages would the users and website communities receive from an effort to develop prototype standards for websites? To answer these, we inspected websites of corporations, governmental offices, and not-for-profit organizations, including various sized ones. We concluded that there is a need to produce guidelines. We identified portions of sites that are excellent and might be recommended as guidelines for developing sites and felt that an effort could make websites easier for users to understand and navigate to complete their transactions, though the content could depend on the website's purpose, the organization's industry type, and its mode of doing business.

Keywords Website architecture and content · Guidelines · Standardization · E-commerce · E-government · Non-profit sites

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1 Introduction

The implementation of the Internet and the world wide web (WWW) have allowed businesses to change from brick and mortar stores into e-businesses and governments to modify their mode of operation from mailing material and hardcopy forms to developing e-government websites that allow citizens to use on-line tax forms and information. Thus the new technologies have removed the access restrictions imposed by time and space to one where access is available anytime/anyplace. Many entrepreneurs have further changed what we shall call the electronic-New-World or *e-NewWorld*; some are providing inexpensive access to entertainment sites offering films on demand, and delayed TV programs; others are providing both simple and complex games, while still others offer free or inexpensive access to social meeting places, both public and private (e.g., to members of a professional society). With a spirit of cooperation, others have set up not-for-profit organizations to provide a website where unpaid individuals can help develop free or inexpensive software systems or write entries for an online encyclopedia. Indeed, the various types of *e-NewWorld* activities have already started to overlap so that simple e-games or e-crosswords now exist on some e-commerce websites (to allow customers to amuse themselves possibly while waiting for special services).

The world is now at a point where the science-fiction-seeming view of the 1970s, an *e-home*, is starting to be more-than-a-demonstration, as the reduced costs of servomechanisms and mechanical interfaces make the concept economically viable: thus an automated transfer of food from a refrigerator to an oven would allow the preparation of a meal while a family is on its way home from a day at the beach or provide a warm house when the family arrives home from a ski-trip. However, such futuristic trends will first need the internet and its user interfaces to be defined so that early implementations are not overwhelmed by a surge of many different systems that do not easily interact.

Noting the amazing advances in the past 30 years led us to ask: what motivates the developers of websites? This led to: how has this affected the content provided on websites? And thus: should the presentation of the contents of websites be designed according to a set of guidelines that provide a comfortable and easily understood interface for the customer/user who wishes to access and/or interact with any website?

Undoubtedly, the development of e-commerce worldwide has outpaced any careful consideration of the need for guidelines for website design. Indeed, the web itself has become so vast and distributed that any change to its protocols or interfaces becomes expensive and thus implementing standards, such as IPv6 for secure transmission of data, has proved costly, as it requires major modifications to a large and (necessarily) somewhat rigid international system. The addition of *cloud computing* from several vendors who have little or no interest in interfacing with others is further complicating the web. Indeed, the difficulties that existed for more than 20 years when there were many different Database Management

Systems (DBMS) but no standards are examples of the need for early standards or guidelines.

We decided that the guidelines should be constructed to satisfy the website's users. We realized that they varied widely, ranging both inside and outside the organization, and thus including: customers interested in buying a product or service via a website, CEOs wishing to impress company shareholders of their organizations' viability, citizens interested in using a governmental website, people wishing to help develop a new piece of software, and those needing to relax by listening to music, playing a game, or solving a puzzle.

Considering the complex problems of designing websites for such a range of sites and activities, we therefore limited our study to addressing the guidelines *from the viewpoint of its users.*

Interest in the internet has grown incredibly rapidly. A driver of this growth was that virtually anyone could create any new kind of webpage. This led to the appearance of numerous novel and highly successful sites. However, as this technology matures and stabilizes, we should begin to consider the value of design standards. Our paper therefore reflects a step in this process. By analysing the needs of users and the content of many websites, we feel that we have laid a solid foundation for some guidelines or proto-standards that would bring more consistency to the user experience of the WWW.

To the best of our knowledge, no direct work has been performed on the need for guidelines on the content of websites. It seems that all prior interest was on developing ways of measuring the effectiveness of sites; recent examples of these include Tran (2009) and Rocha (2012), among others. As our overall objective was to generate guidelines leading to standardization of the important interfaces to common contents of several types of websites for users, we first considered it necessary to determine the set of motivations of the developers of the websites. It seemed axiomatic to assume that the motivation of the developers of the site was to interest, and thus retain, the users who visited the site. Therefore, the organization would require the website to satisfy the needs that they *believed* user hoped to fulfill when using the site. This effort is discussed in Sect. 2, where the types of websites are discussed, leading to Sect. 3, in which the corresponding types of users are categorized. This allowed us to consider and propose the set of needs of the users in Sect. 4 and thus to select a set of modules that would be needed to satisfy these needs (in Sect. 5). The resulting set of components of modules as guidelines or proto-standards were thus reported as a major output of our work in Sect. 6.

The next part (Sect. 7) deals with our way of confirming that our proposed guidelines would provide what the users required. We accomplished this in two ways:

- We analyzed the contents of a set of websites worldwide selected to be as diverse as possible, both in organizational size and industry type, etc. The contents are reported in Sect. 7.1 and these are compared with material in our guidelines in Sect. 7.2;

- Then, based on our assumption that providers of tools to help in producing good websites worldwide must understand the needs of users according to their own experience, we briefly surveyed website-tool-merchants' systems to determine their spectrum of website functions, as described in Sect. 7.3. These results were then also compared with our guidelines.

The chapter then provides a discussion of our conclusions, in Sect. 8, including a discussion of the need for guidelines, possible limits of our study, and recommendations for future work. It ends with a set of references and two appendices providing the lists of sites we searched and the list of website developer tools consider in our work.

2 Types of Websites

Corporations no longer wonder whether they should launch or own a website. Commercial websites have become a competitive necessity. Indeed, their activities are limited by many laws, both Federal and State (e.g., Westermeier 2011), that have been passed to control the ways that the website receives, distributes, and stores private information (Federal Trade Commission 2007). Organizations are no longer restricted by their geographical location and can enhance their supply chain by sharing their information via a portal on their websites which allows access to up-to-date company information; this information can be used in planning systems to lower the average inventory by reducing work-in-progress. Online presence allows companies to serve their customers better by providing a 24 hour service ranging from answers to simple inquiries to providing a full shopping experience. This can help to improve customer service and provide a solid basis for customer relationship management (CRM) (SAP CRM Notice 2012).

Customers also benefit from an online presence: information is readily available. This allows potential or actual customers to learn more about available products and services. Thus e-NewWorld systems allow customers to attempt to find less expensive or more competitive delivery of products and services.

In the e-government sector, departments have been required to reduce their and the public's paper handling according to the PRA (PRA 44 USC 3501 et seq. 1980); the use of a departmental website helps in reducing the printing and transcribing of paper forms to help achieve this by allowing citizens to download forms, fill them in on-line, and upload them when completed for taxation and other purposes, such as announcements of changes to local tax rating of property and for paying traffic fines. Moreover, governmental organizations worldwide are passing laws that require all website owning organizations to provide access to all users including the disabled (e.g., the Disability Discrimination Act and the proposals of the W3C that require legal prosecution of site owners who ignore the laws),

We surveyed websites, as illustrated in Appendix 1, and decided that there were nine prime types. The most well-known today are *e-commerce* sites, as provided by major international companies, who use them, among other purposes, for selling products or services: these can be split into sites for *products* (Website-type 1) or *services* (Website-type 2); naturally they are not unique, as many organizations provide both products and services (or soft-products). Indeed, some services are informational in nature (such as online news) while others are data download sites (allowing access to databases or maps).

Probably the next most prolific websites are those associated with supernationals and countries (Website-type 3), or with administrative portions of countries (Website-type 4), such as states, counties, cities, towns, and other municipalities. These websites are generally used for distribution of forms and information on taxation, fines, necessary forms, and local meeting dates and agenda, etc.

A very rapidly growing set of websites is involved in entertainment of the public, using traditional modes distributed over the web (Website-type 5), including motion pictures (films), original or delayed TV programs, etc. Another major segment and wildly growing group of websites provide complex games (Website-type 6), which allow either people or groups to play an on-line game (well-known, traditional board-games or battle-games with rapid activities, such as fights with demons or warriors).

The growth of *social networking* has also been rapid and there are many worldwide groups (Website-type 7) who provide relatively unformatted content-free space for posting blogs and photos, etc. These may be freely-available to anyone or be provided for special groups such as professional organizational members.

Naturally many non-profit organizations use their site to explain their *modus operandi* and advertise their philanthropy or seek funding to support their activities (Website-type 8). There is also a type of such websites whose role is to provide a place where freeware or free information is developed by people who are knowledgeable or skilled in their development (Website-type 9).

2.1 A Generic Architecture of a Website

The normal website today seems to be one with a hierarchy of components linked through pointers that allow navigation between major components (See Fig. 1). Thus the typical corporate website has a "click-point/button" that allows a person who is not interested in the general information on a site to click a button on their homepage, this takes them to a page that contains a catalogue or search-engine to help them find information about their item of interest and purchase it if it satisfies their price and other needs.

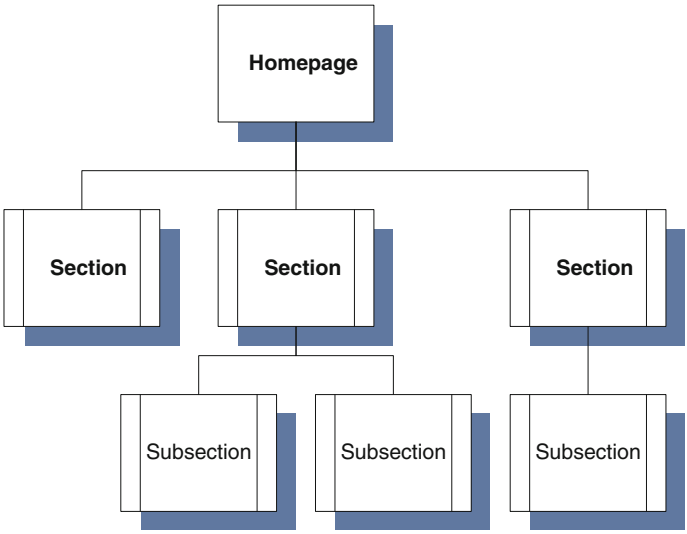

Fig. 1 A generic example of a hierarchal website structure

3 Types of Website Users

There are many different types of website users (citizens, customers, browsers), each having some distinctly different need(s), and being interested in one or more types of website; most expect to find answers by logging into the organization's website. Obviously, all their needs should be considered when architecting a site. Sharp (2002) has suggested that there will be one or more of six positive response actions when users are motivated by their experience with a website, they:

- remain for more than a short time at the site;
- download some content from the site;
- send some content to another person;
- subscribe to some regular reaction, such as a regular catalogue;
- purchase an item from the site;
- return to the site at some future date.

She states that a website should provide *strategic stakeholder communication* being "based upon at least one conscious measurable objective, applicable to its very existence" and that this leads to the user having "a state of self-gratification" (Sharp 2002) after interacting with the site.

Most websites today are modified regularly due to changes in the marketplace or world conditions, such as the effects of external incidents, such as messages to employees after a local earthquake. Also, some people are interested in the financial viability of an organization (e.g., when wondering whether to invest in or partner with it).

Users may, of course, be external or internal to the organization, depending on the user's objectives and the motives of the developer; e.g., an employee who is a site maintainer uses it when changing prices, etc. Even criminals who abuse the site by breaching security, and possibly stealing or disclosing private information, must be considered as (unwanted) users: specifically when designing ways to exclude them from breaking into restricted portions of the site.

3.1 User-Types for Website-Type-1 and -2

These users are interested in e-commerce sites providing products (type-1) and/or services (type-2) and also include people interested in learning about and partnering with the firm; they also include:

- Customers, either personal shoppers or purchasing agents of a corporate buyer, interested in buying goods or services from the firm. Different classes of users may require different processing, such as browsing the site to find interesting products and/or services and then determining their price and availability, including transportation details and their promised date of delivery;
- Potential employees, interested in working for, or with, the firm and looking for job-openings. Hiring is, of course, normally a task of the human relations department of the organization and it is serviced via on-line bulletin boards;
- Potential shareholders, interested in buying Shares, and part-owners of the organization (holders of preferred or ordinary shares, etc.), who wish to know the financial state of the organization: its income/return per share for the current fiscal period, expected return for the next fiscal period, etc. Some of the material may need to be located behind a password protected firewall to ensure that only those with a need-to-know are allowed access;
- Suppliers of materials or services to the firm and users working for an organization with contractual obligations with the site owner and normally joined to it through a supply chain. They are potentially interested in responding to bids on items of mutual interest and may have signed a contract to provide material or service over the next fiscal period on an as-needed basis;
- People interested in using the site as an entry point to a social network for personal or professional sharing of information. This may, of course, be a service provided internally;
- Scholars Providing social, technical, or informational material by entering material into an encyclopedia or dictionary internal to the organization (an internal form of users of Website-Type-9);
- Criminals hacking into website; they should be excluded, when possible.

3.2 User-Types for Website-Type-3

National and super-national organizations include the countries of the world and the United Nations (with its many Agencies, such as the World Bank, IMF, UNDP, and ILO), the European Community (EC), and international organizations such as NATO, SEATO, the African Union (AU), and OPEC. Their users can be categorized as citizens of countries or officials assigned to organizations interested in:

- The types of services provided and how to access them;
- Ways for users to access and request information (including a search-engine to help in finding the correct addresses for manual or e-commerce use);
- Historical notes about the organization, country, or agency;
- Discussion of special laws and restrictions, with explanation of taxes and other issues that a visitor may need to know;
- Special rules about medical conditions and medication, such as anti-bacterial shots required for entry to the region;
- An explanation or discussion of any laws and regulations in process with a warning if any seem to be likely to cause trouble to a traveler in the near future;
- The published or internally available activities of the international department, such as minutes of prior meetings on important issues and dates of future meetings (*especially* for officials of member countries assigned as workers at, or hired as employees of, the organization). News reporters and lawyers may also be interested in the same information, if it is public in nature.

As with Users of Website-Type 2, contractors supplying or hoping to supply material to the organization are likely to be interested in hearing of, and replying to, RFPs published on the website; users may also be interested in joining a social network sharing information.

The users of super-organizations are generally interested in similar issues, except that they are not always bound by law to the requirements, except when they deal with financial matters, such as taxes on purchases (normally as country VATs in most of the world).

3.3 User-Types for Website-Type-4

This type of user are the citizens of a country who, because of their home location or place of purchase of a product or service, are subject to a different set of laws or taxes. For example, in the US all non-income taxes depend on the location of the transaction; e.g., as simple percentage sales-tax by states and municipalities. Some countries have special tax laws that lower taxes on transactions of citizens or organizations of other nations or members of their group (such as the EU), These are also discussed on some websites and help users determine their way of reducing payments or obtaining refunds on taxes paid but not applicable on their transaction.

Otherwise, the users of this type of website are similar to those of the national and super-national community.

3.4 User-Types for Website-Type-5

Entertainment covers many types of websites including TV, with both real-time and rebroadcasts, films, with opera and music performances as special instances. For most of these user-types, quality of the material is important, as the user expects to enjoy the material presented and not have extraneous jumps in the presentation due to lower-than-needed bandwidth of the transmission or delays while the material downloads, thereby inserting annoying interruptions in the performance. Otherwise the users behave in a similar way to those who are buying a service, except that they are generally "consuming" it immediately.

3.5 User-Types for Website-Type-6

Games, when small or relatively easy to solve may be provided either free or as a service to amuse customers who are forced to wait for an activity and thus need a *fun project* to retain their interest in a purchase. The users of long running games are generally either working alone or in groups to achieve some goal (to *win* the game). Thus they generally are motivated to play by the friends they meet or play with them as a team or opponent or they like the script, illustration, and music played during the game. Otherwise the users have very similar expectations to those who are being entertained on website-type-5.

3.6 User-Types for Website-Type-7

Public social networks are a rapidly increasing way of meeting new friends and renewing old friendships, They are somewhat of an anomaly as the first provider in a country sometimes becomes the only one that can maintain the cost of the enormous growth needed to become profitable (presumably as people blog in their own language and tend to cluster on a particular provider). However, non-public sites provided as a membership privilege to users in a professional group or social club, are becoming popular. Users of this type of website need little other than an ability to write as many and as large a set of blogs as they wish and post them with photos or films for access by friends and other bloggers.

3.7 User-Types for Website-Type-8

Not-for-profit sites provide material on specific philanthropic and charitable organizations. In general the users of this type of site are looking for similar material to that of users of e-commerce sites: availability of funding for their project, operation, or research experiments. Some users also wish to know how they can contribute to the charity or foundation.

3.8 User-Types for Website-Type-9

Producers of freeware or compilations of information provide a site and some management help to the users who are willing to spend their time in developing a part or component of the material. Such users are motivated by their pride in producing a useful product and a feeling of achievement in the results (Li et al. 2012).

3.9 Some Interim Conclusions About User-Types

The largest number of users of the different website-types are people wishing to access it to obtain information, products, and services from it and often to respond to the site to complete their operation; other people or organizations are looking for opportunities for working with or together with the organization as an employee, partner, or sub-contractor to bid jointly for work in response to some published need, such as an RFP, for a contract from a Government or major organization; of course, these activities can be more effective when supported by a supply chain linking their websites. Thus, it appears reasonable to suggest that the websites of the future should be developed using proto-standards or guidelines so that the user only needs to learn one general set of navigation rules and then be able to access any website.

4 Needs of Users

Users of commercial sites and citizens using Governmental sites are often searching for and either purchasing or downloading material. They therefore need to follow a process that entails searching for the information needed, selecting the way it will be delivered, and paying for any costs. The use of a site by local governments also requires transactions that involve similar processes such as downloading forms, paying fees, fines, real estate taxes, etc.

Almost all users of websites need a well interfaced *bulletin board* equipped with a good *search engine*. Such interfaces are relatively easy to build. For example, users wishing to learn about the history and management of an organization or to learn of available partnerships or supplier opportunities need to access and respond to a bulletin board and directory on the organization's website. The same site can service people interested in purchasing a corporation's shares, though they probably would, at that time, like to access a copy of the organization's financial accomplishments in recent years. Lawyers may wish to know of the restrictions to access placed on site visitors and this type of user generally requires a separate section of the site, to deal with the site rules of operation. Foreign visitors to a country should know of any visa or legal restrictions of the country they intend to visit: this also suggests a need for a bulletin board to request and receive information, provide responses to questions and submit filled-in forms. People wishing to find and access entertainment also need very similar interfaces with different material in their databases, while those seeking games may either know their interface or choose them using the manufacturer's website or a search engine. Social websites are either public, and entered via a separate portal, or private to an organization, when they are accessed via its website, possibly behind a firewall. Freeware sites have a similar need to provide a special portal.

5 Modules to Satisfy the Major Needs of Users

By working on and analyzing many websites including the Fortune 500 Corporations and large Governmental departments as well as those of small and medium sized organizations, we concluded that websites can be modeled into a three part architecture that includes:

- a *General* Section, providing the *history and status* of the organization or department;
- a *Business* Section, providing ways to *satisfy their users' needs*, such as a process for purchasing goods or services, or a way of downloading forms, or paying taxes online, etc.; and
- a *Legal* Section, holding all statements that *protect* the website and its owner by adding Terms of Use, a privacy statement, a copyright statement, and a security logo, etc.

Such an architecture is provided on almost all types of websites. This is illustrated in Fig. 2.

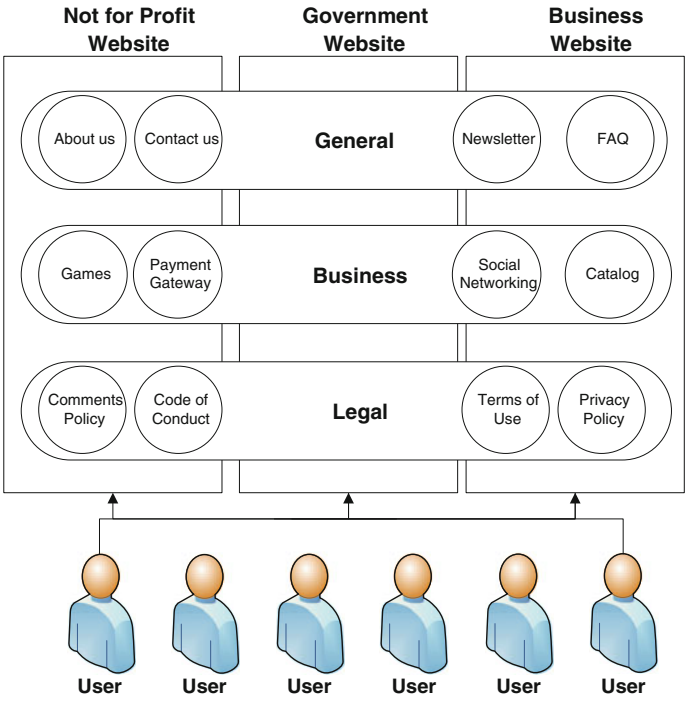

Fig. 2 The generic architecture of an organizational website

5.1 The General Section

This section is unlikely to be standardized as it serves as a place where the organization disseminates information or boasts of its special abilities and achievements, such as new products or processes developed or new laws or regulations that are important to the public, etc.

5.2 The Business Section

People who need financial or company history will be serviced by accessing material provided in this section. Those interested in partnering with an organization need to know what bids or RFPs the website owner is expecting to answer (and when). They obtain this information either from their Marketing Department or via a direct query from the website owner interested in establishing a joint task force to prepare a response; this entails working on the proposed effort, its cost estimate, schedule, and management plan. Such an effort can be conducted using direct meetings, e-mails, or an internet blackboard with a meeting room. At present, such an activity is not

normally provided on an organization's Website, but in future it will be possible to add modules that support such efforts. Similarly, those who have contractual obligations to work together can do so through a blackboard system operating via a supply chain. Although these do not currently work through the website of the prime contractor, there is no reason why they should not do so, at least virtually, by linking systems through the websites.

Users who are making a purchase of goods or services from a retailer and citizens needing Governmental information need to follow a process that can be completed in five steps:

Step 1. *Search for a Corporate Store or government department Selling or providing the goods, services, or forms needed*. This may involve the use of a search engine or intelligent autonomous software agents (*bots)* to gather information about choices available to the user.

Step 2. *Navigate and Select the Product of Interest.* This may result in a customer selecting a particular item because of its price or other criteria, such as its availability and the seller's reputation, or a citizen finding the necessary forms or information to complete a requirement, such as paying taxes. A transaction may also depend on negotiating a price in some medium of exchange or barter. Navigating the site is provided by a search of a *catalogue* of products and/or services offered by a company or services offered by a government site. In a commercial company once a user select an item the data on it is collected into a *shopping cart* for later payment.

Step 3. *Checkout (Payment).* This involves any form of electronic payment available *from* credit or debit card *to* payment through a Bank, etc.

Step 4. *Delivery of any hard goods purchased or downloading forms or software.* The parties must agree on the time and method of delivery of the purchase. For hard goods, the vendor will send a confirmation that allows the buyer to track the process of delivery.

Step 5. *Recording the transaction and storing it for future data mining.* Though this is optional it is generally added on larger websites.

Other types of websites have similar processes that depend on their function and type but generally are subsets of the more general retail site.

5.3 The Legal Section

T*erms of use* and *privacy* statements are familiar elements on website today for net shoppers. Even if they are not noticed by the user at the start, once they try to register, buy a product, or request a service, a request will generally appear asking them to read the *material in the legal section* and agree with its requirements (e.g., by signing an agreement as a potential customer) before trying to further interact with the site.

Today most websites that collect information include such statements to both protect themselves from user misuse of their site and to assure the user that the company will not misuse any personal information that they were required to divulge in signing on as customers or other users. Social network websites may not need strict copyright or other legal strictures, though their use world-wide can mean that a corporate website providing a social net component needs to protect itself from litigation due to trouble with illegal material (such as lists of passwords for other sites or copyrighted material) placed on its site and thus disclosed to anyone surfing the site. Also, people working on a website to generate (normally-free) software, such as LINUX, are little restricted but, in future, they may be made to comply with laws that affect their use of software copied from another site, etc.

6 Components of Modules as Proto-Standards

We downloaded and analyzed many websites and report later in this section on their contents, but could find only a few examples that could be used as a starting point by a committee formed to develop a set of guidelines or proto-standards. In fact, it seems that the components of the business sections have already been implemented as modules and procedures in various implementations of CRMs.

The legal section (*q.v.*) has, however been carefully implemented on many international organizations, and therefore its material can be mined for good proto-standard component definitions.

6.1 Components of the General Section

Most organizations have their own opinion on what they wish to include here, e.g., there is no reason why an organization should not include much of its annual report or general physical site information here. Indeed this is a place where the head of the organization (public or private) decides on the information that must flow in and out of the organization.

6.2 Components of the Business Section

As already suggested, this is where the CRM software may be joined to the organization's website. Indeed, it probably does not make sense to try to incorporate this in the guidelines except as links—or the problems of bringing together the major providers of CRM and similar software to produce guidelines will probably prove impossible.

6.3 Components of the Legal Section

We are proposing three legal components for incorporation into a draft standard/guideline document: the *Terms of Use, Privacy Policy Statement,* and *Intellectual Property Rights.*

6.3.1 Terms of Use

This is a legal statement of the ways that a user may access and interface with the website; it explains the policy of the organization about its use, usually requiring the "user" to agree to the conditions before downloading or otherwise interfacing with the site unless the customer is merely "window shopping" or navigating in the electronic catalogue, though even this material is often considered proprietary and thus may be copyrighted to protect its image and use in future promotion campaigns. The typical components are:

- Company Name/Website Information
- Changes to Terms
- Scope of Use and User E-mail
- Intellectual Property
- Links
- No Warranties

A *terms of use* statement ensures that the user of the site agrees to the rules of the site when navigating and using it. An excellent example of a website's *Terms of Use* statement is that of the Microsoft Corporation (Microsoft Corp 2012) as updated on January 26, 2012, it includes:

- Acceptance of Terms Each of these should probably have some explanation
- Description of Service
- Personal and Non-Commercial use Limitation
- Privacy and Protection of Personal Information
- Notice specific to available on this web site
- Notice specific to documents available on this web site
- Notices regarding software documents and services available on this web site
- Members account, password, and security.
- No unlawful or prohibited use.
- Use of services
- Material provided to Microsoft or posted at any Microsoft web site
- Notice and procedure for making claim of Copyright infringement
- Link to Third Party Sites
- Unsolicited idea submission policy
- Copyright Notice
- Trademark.

6.3.2 The Privacy Policy Statement

The operation of a website normally requires the site owner to store and retain information culled from any transactions between it and a customer, including a statement that assures the user that any personal data that they provide to the organization will be secured from access while being moved and stored in the organization's database; the organization generally (legally in most major countries today) informs the user providing any data of any ways that such data may be divulged to third parties (generally requiring the person's agreement if any is to be divulged between the organization and another organization or user). Obviously, all organizations must generate a database of information about their customers and retain it securely to complete any purchase and for use in future contacts.

6.3.3 Intellectual Property Rights

These include protection, of course, of all four major components: patents, copyrights, trademarks, and trade secrets. Of these, copyrights and trademarks were included in the terms of use statement of Microsoft (above) and could be separated from that sub-section if there were any special issues that needed to be discussed, for example if the copyright of a motion-picture had different interpretations in different locations (such as the colorization of a Woody Allen movie in Europe infringing the law, while it does not in the US), etc. The question of patents is also an area where there may be differences of opinion in different parts of the world, for example in the question of when the patent comes into effect—at application for it, or when granted by the patent authority.

7 Confirmation of Our Guidelines

We confirmed our results by making two comparisons: (1) of the proposed guidelines with the contents of a relatively large and diverse set of websites downloaded from the WWW, and (2) of our proposed components with those culled from software currently available for developing websites worldwide.

7.1 The Contents of Our Downloaded Sites

In 2012, we downloaded the legal portions of the *US FORTUNE* 500 companies. We augmented these with downloads of other sites picked from different countries and representing different sized (large, medium, and small) organizations and industries; these we split into *types of websites* and decided on the *types of users* for each and their apparent *needs*; this allowed us to map the

Table 1 The privacy policy used on a website

The parts of the privacy statement	FIPP
Mazzoldi hotels global internet privacy policy	Notice/Awareness
Web site privacy statements	Notice/Awareness
Information collected on Mazzoldi hotels internet sites and how it may be used	Notice/Awareness
Sharing personal information	Notice/Awareness
Security of personal information	Integrity/Security
Links to third party internet sites	Notice/Awareness
Access to personal information	Access/Participation
Retention of personal information	Notice/Awareness
Children and parents	Enforcement/Redress
Questions about this policy or our privacy statements	–
Changes to this policy and our privacy statements	–

This Policy was last revised on March 28, 2012

needs into *modules*, leading to a definition of the *components* that could become the topics of guidelines for website design or *standardization* efforts.

In general, Corporations in the US included, on their website, material to satisfy all five core principles of the US Federal Trade Commission's Fair Information Practice Principles (FIPP) (Federal Trade Commission 2007): Notice/Awareness, Choice/Consent, Access/Participation, Integrity/Security and Enforcement/Redress These five principles ensure that the users have the right to know how the company is using the personal information that they had had to provide to complete their transaction (hence *Notice/Awareness*). The *Choice/Consent* principle allows the user to be in control of *what and how this information may be used*. The user may access and change or update the information where he/she is allowed to view, update, or change the data according to the *Access/Principle*. The *Integrity/Security* principle ensures that the website guards the data to make sure it is not accessed or corrupted at the site and to ensure that the data is protected using an encryption or protection method both at the site and when sent elsewhere to a valid user such as the bank. The *Enforcement/Redress* principle states to who is held accountable if abuse occurs.

Table 1 shows the parts of the Privacy Statement extracted from the site of the Mazzoldi Hotels (2012) with their mapping to the FIPP.

7.2 Analysis of these Sites to Validate the Study

By looking at different websites of organizations in different industries and different sizes (Large, Medium and Small) we were able to confirm that the websites may indeed be separated into three sections:

The Identity Section consisting of general information that has to do with the company, including sub-sections such as: *about us*, *FAQ*s, *Who are we*, *News Letter*, and *contact u*s.

The Business Section consisting of products and services offered and other marketing and sales processing such as *advertisements* and *social networking entry points* (e.g., to SSR, Twitter, or Facebook), *shopping carts*, *product catalogues*, and an entry for *creating a use account.* This therefore provides the "market space" that a customer navigates in a commercial website. It is interesting to note that government websites include many of the same features, such as payment methods, and, on some websites, the government even allows some commercial advertising.

The Legal Section containing many different elements that strive to protect the clients' data and other private information and also to protect the organization from intruders and other criminal activities. It also has material drawn up by the corporate lawyers dealing with the website's *terms of use*, its *privacy statement*, *condition of use*, *copyright*, *quality* and *security.* Its logos are generally also displayed.

In addition to the 500 sites of the 2012 Fortune 500, our analysis concentrated on four different industry-types: Apparel, IT/Software, Advertising, and Entertainment. From these industry types we chose different size companies and companies from different continents. In addition, we reviewed several government and non-profit corporations from different regions and countries. The set of websites surveyed is shown in Table A in the Appendix.

By examining the different industry and government websites we identified the elements that we extracted from reviewing the website development companies such as: (*About us*, *Contact Us*, *Catalogue* (business, service, or information), *Search Engines*, *Subscription*, *FAQ*, *Social Networking*, *Terms and Condition*, *Registration*, *Site Map*, *Copyright Notice*).

Our results were:

About Us. 100 % of the companies included this. *Hermes* a Large company instead of using the term *About Us* used the term *KNOW-HOW* for the portion that talks about its history. This field also discusses: Who are we? What do we do? When did we begin our business? or When was this department initiated by the government? What is our history? And, Do we complete our short-term goals? All companies contained this section but not necessarily in the same part of the main page.

Contact Us. All companies provided this. It was interesting to note the different methods used: 27 used e-mail as their mechanism, small companies used the telephone, two large government sites also provided phone numbers but had a directory that could be surfed to locate the number of an employee in a particular department; only one company used live chats, and all of them had either an address or an e-mail address, except for one small company, BBDO Asia, which provided only an e-mail address.

Social Networking. All Government Sites examined had access to this module on their main page. Commercial sites varied substantially, 62 % of Large

Businesses had Social Networking on their Homepage including Twitter, Facebook, RSS, Flicker, Instagram, and YouTube. One-third of the medium sized companies had this section available, but only 38 % of small businesses provided such access. All Not-for-profit organizations had such sections and all used Linked in as another access icon on their homepage.

News. There are many sections that contain news. A simple News section with updates daily, weekly or even monthly were found on all on sites exception those of small companies. *Newsletters*, however differed from one industry to another. The *Apparel* Industry all had newsletters or similar types of promotions. The *Nonprofit corporations* all had newsletters. Of the other industries and government sites, only 50 % had newsletters or promotions evenly distributed amongst large, medium, and small companies.

Catalogues of products or services. We found that three of the industries—*Apparel*, *IT/Software*, *and Entertainment*—had catalogues. The *Advertising* Industry varied, with one large and one small company having a catalogue section. Government sites also varied, with 60 % having an information catalogue section. The *Nonprofits* all had a catalogue displaying their portfolios and current projects and services.

Search. 75 % of all *companies* included this on their homepage. The *Government* and *non-profit organizations* all had a search section on their sites. Also the *Large companies in each* i*ndustry* had a search mechanism. Small and middle sized companies did not always have a search mechanism on their site.

Terms and Conditions. This section occurred on 62 % of the sites. Large Companies in all had such sections. The *Apparel* Industry had such Sections in their companies, but for other industries, only the large and medium organizations had such facilities. It was surprising that only one government site—Dubai.ae—had a *terms of use* portion, but this site was the only one that allowed citizens to pay bills and traffic violations online; thus it included most of the sections of a commercial website.

Privacy Policy. This was found on the homepage of 81 % of the company websites. The *Apparel* and *IT/Software Industries* had this statement on all their site. One of the companies from the *Entertainment* industry did not have a privacy statement while all others did. However, the Entertainment Industry, in general, lacked many of the elements discussed earlier. All *government* sites except one included a privacy section and all *nonprofit organization*s had a privacy section on their site.

FAQ and Help Sections. The government sites were the only ones that included a FAQ or Help Section. Most of the nonprofit organizations had it on their websites. In the Apparel Industry, all but one had a section, while the other industries varied with no apparent effect of company size.

From these observations we conclude that most companies included these basic elements (*about us*, *contact us*, access to a *catalog*, *news*, a legal statement on *privacy,* or *terms of use,* or both).

We also noted that, not surprisingly, larger companies provide more advanced features, such as a search engine. Also, for most sites users (visitors) may not be

required to sign into navigate the site, but if customers decide to buy a product or service or otherwise complete a transaction, they must, obviously, register. Other advanced features, such as a paying mechanism are found in all larger companies, but only in some medium or small sized organizations. We found a payment mechanism in one of the government sites.

7.3 Analysis of Commercial Tools for Developing Websites

Presumably the continued existence of a website-tool developer depends on its matching the output of the tool with *what the market demands*; i.e., what their customers feel should be present on their website after developing it by using the tool. Thus, no matter whether a company decides to develop and maintain its own website or out-source its development to a vendor, the website should contain similar material and might be expected to contain a similar set of modules. We therefore reviewed website developing company's material and tried to highlight the common parts that we found in them.

We explored and reviewed website design companies available on the web (see Table B in the Appendix for those considered). Though many different types of website building tools are offered—including those for commercial websites, personal websites, and blogs, educational websites, government websites, and even tools for smart-phones–, we focused on tools for commercial websites, such as those used by small, medium, and large enterprises.

We began by analyzing the sections provided on the website of website development vendors and analyzed some samples of websites that they had developed (as stated in their portfolio). This allowed us to review templates that website developers sold to those interested in developing their own site. Thus, we were able to assess what packages were available and their contents. We found material on over 200 companies on the WWW and examined about 100 by using a webhosting search (Webhosting Search 2012), we also looked at some randomly selected large enterprises and evaluated some Free website development companies online. All of the companies specialized in web design. They ranged *from* large companies such as (AT&T Website Solutions) (AT&T 2012) in the United States *to* a medium size web design company (Siam Communication) in Hong Kong (Siam Communication 2012), and *to* a single owner company (DCC Design), a small company in the UK (Dcc Design 2012). See Table 2.

We noted that the medium to large developers normally offer bundles of modules that could be selected by their customer. *AT&T Website Solutions*, for example, offers three bundles:

- *Basic*: a 3 page Design with a simple website design that provides simple features, such as information about the company, the product or service, and contact information, with one mobile page;
- *Enhanced*: an advanced design with two sections of choice such as FAQ, or Blogs and three mobile pages; and

Table 2 A sample of website design companies and the packages they offer

	Developing company name	Packages and options offered			
Large company	AT&T Website Solutions	Basic (3-Page Design)	Enhanced (5-page design)	Premium (store design)	–
Midsize company	Siam Communication	Basic	Word press customization	E-commerce	PhP/ MySQL business intelligence
	Go-Globe	Startup	Business	Custom	Premium
Small company	DCC design	Design and build	–	Ecommerce websites	Content management
Build and maintain your own site	Webs (free site builder)	Basic site builder with premium templates	Enhanced	Ecommerce and other features	[Professional analytical with all features

- *Premium*: a "store design" that contains a full online and mobile design including many built-in features, such as: catalogue, shopping cart, and payment feature.

Siam Communications also offered different packages that range from Basic (similar to that of AT&T) to solutions that sell products. It also expanded its product to provide more advanced security and business intelligence by using CRM solutions.

Smaller companies seem to follow a similar strategy. Their websites are simple and they do not become involved in huge projects but, in general, design websites of small and medium companies who do not need advanced features, especially those that would require intelligence about its data.

As an example of a website developing company, we concentrated on the packages and feature offered by *Go-Globe A* (2012a). The company has a wide variety of customers worldwide, including large companies, such as Bytech (offering products and services in the UK), Verve international (a consulting company based in Hong Kong) and Noel Duigan (a modern design organization based in Australia). The Go-Globe company has also developed sites for clinics and hospitals (such as the Infinity Clinic in Dubai and the Oasis Hospital in Al-Ain, UAE), as well as for governmental sites, such as the Department of Transport in Abu-Dhabi and the Abu Dhabi Education Council. Table 3 shows the range of packages it offers (Go-Globe B 2012b).

Thus by exploring the different Software Companies, we found that all offer similar packages, agreeing on the general features and sub-sections that are needed for a modern website.

When we examined personal websites, the Basic package with the minimal requirements consisted of Home, About Us, Service, and Contact us sections. But if we considered commercial websites, whether they did or did not include a store front, they definitely contained the *basic* plus all the sections that dealt with any

Table 3 The packages offered by GO Globe, a website developer

Package name	Description	Details	
Startup	Basic module suitable for personal sites, blogs or small startups	Home about	Services contact
Business	Primarily for medium businesses	Blog	E-mail letters
		Enquiry cart	Calendar/Events
		FAQ	News
		Newsletter	Photo gallery
		Products	Showcase
		Tell a friend	
Custom	Suitable for e-commerce carts	Ads management	Auction
		Business Directory	Classifieds
		Intranet/Extranet	Inventory management
		Invoice, Sales reports	Membership
		Payment integration	Shopping cart
Premuim	Suitable for large corporations	Compiling competitor analysis and comparison report	Defining business and user goals and objectives
		Evaluating design alternatives, building prototypes	Conducting tests: threat modeling and vulnerability analysis

information about the company, such as the Blogs, e-mails, calendar, events, FAQ, News, the Photo gallery, etc.

Finally, small, medium, or large companies acting as a store front (providing the website as an online store) included sections that provided more advanced ecommerce features, such as a shopping cart, payment feature, inventory management, etc.

We expect that better sites will be provided by large organizations, as they are likely to have a more complex structure with better software additions, such as *search engines* and *data mining tools* that make the site faster to use and seamless.

8 Conclusions and Proposed Future Work

The architecture and components of a website that we have proposed have been shown to be very similar to those:

1. developed by or for the FORTUNE 500 companies and all but the smallest in most industries;
2. developed by or for governmental agencies, again excepting the smallest;
3. produced by software tools available from website developers to aid in the development of the website;

This can be considered to be a proof by example that our suggestions are reasonable and correct. There are however several limitations in our work and other issues that need to be discussed before any proto-standards committee could expect to make any headway in developing guidelines to aid the users and organizations publishing websites (i.e., essentially all organizations today). These issues are now briefly discussed.

8.1 The Need for Guidelines for Website Designs and Practitioners

Users of websites throughout the world have found that navigation to find products and services is confusing and/or annoying because substantial differences in architecture and formatting of sites often makes a user *learn* each specific site's idiosyncrasies before being able to assess its advantage over others to determine its competitive advantage. This obviously affects the user, who may just "give up" searching for the best offer or affect the website owner by "losing a customer" to a competitor, resulting in loss of income. The same is true of national and international agencies are seldom structured in the same way and thus have frustrated users searching for the information or forms they need to download.

Thus both the publishers of websites and their users would find that browsing, modifying, making transactions through sites, and generally utilizing their capabilities would be easier if they provided a uniform interface; differences today occur both in the formatting and language for accessing and interacting with the sites as well as the process needed to navigate their architecture. We have shown that all sites have large sections that perform essentially the same activity and that they could be navigated easily and effectively if all developers complied with the same set of guidelines for their implementation. However, the process of developing large proto-standards is never simple and should be started before there are many different implementations that become difficult to unify and coordinate.

8.2 Limitations of Our Work

In order to confirm the material needed on a website formally, we should confirm the components by a survey of many users to determine whether there were more than the nine that we postulated (which includes the unwanted hacker). It would also be reasonable to survey the owners of websites of a wide range of

organizations including all our types with variations in industry type and organizational size to determine whether region of the world or other factors seem to change the needs of organizations. In this sense, the limitations to our work become the suggestions for future work on the topic.

8.3 Recommendations for Future Work

We intend to survey CIOs, VPs. or other top executives of organizations to determine their reasons for financing the development and Maintenance of a website and also to find whether their own website is, in their opinion, effective in satisfying their needs.

Apparently, large, medium, and small organizational websites can adopt similar architectures and standards, though smaller organizations may have problems with cost resulting from maintenance of the site, due to fluctuations in price of raw goods affecting the cost and hence the price and the effect of special marketing ploys or offers of bulk discounts, special deals, etc. It might not be difficult to achieve this with a site that is carefully architected as a linked set of components or modules and with buttons that transfer the process flow to a new or easily modified component. However, this mode of operation may increase the cost and slow down access for the user.

Appendix

Table A Websites surveyed to determine their modules

		Name	Website address	HQ location
Apparel	Big	Adidas	www.adidas-group.com	Germany
		Hermès international S.A	http://www.hermes.com/index_us.html	France
	Medium	Maverik Lacrosse, Inc.	http://www.maveriklacrosse.com/about	US
		Volcom, Inc.	http://www.volcom.com/index.asp	US
	Small	Mechanix Wear, Inc.	http://www.mechanix.com/	US
		Threadless	http://www.threadless.com/	US

(continued)

Table A (continued)

		Name	Website address	HQ location
IT/Software	Big	Tata consultancy services	http://www.tcs.com/Pages/default.aspx	India
		Unit 4	http://www.unit4.com/	Netherland
	Medium	2 Wire inc.	http://www.2wire.com/	US
		Bottonline Technologies	http://www.bottomline.com/about/facts_at_a_glance.html	US
	Small	112db	http://112db.com/about/	Netherland
		Ashampoo	https://www.ashampoo.com/en/usd	Germany
Entertainment	Big	Ea Games	http://www.ea.com/about	US
		Xsens	http://www.xsens.com/	Netherland
	Medium	Imagi animation studios limited	http://www.imagi.com.hk/eng/	Hong Kong
		Bavaria film	http://www.bavaria-film.de/index.php?id=917	Germany
	Small	Aniplex	http://www.aniplex.co.jp/eng/index.html	Japan
		Riot games	http://www.riotgames.com/company	US
Advertising	Big	Publicis groupe	http://www.publicisgroupe.com/	France
		Omnicom group	http://www.omnicomgroup.com/home	US
	Medium	Dentsu Razorfish Inc	http://www.dentsu-razorfish.com/en/	Japan
		BBDO China advertising co.	http://www.bbdoasia.com/	China
	Small	Creative land	http://www.creativelandasia.com/contact.htm	India
		CPP studios	http://cppstudios.de/en/home_en/	Germany

	Name	Website address
Governments	US FCC.Gov	http://www.fcc.gov/
	US DOC.Gov	http://www.commerce.gov/
	US DOT.Gov	http://www.dot.gov/
	France diplomatie	http://www.diplomatie.gouv.fr/en/
	Dubai.ae	http://www.dubai.ae/ar/pages/default.aspx
Non-profit organizations	Bill and Milenda gates foundation	http://www.gatesfoundation.org/Pages/home.aspx
	Redhat	http://www.redhat.com/
	CHF international	http://www.chfinternational.org/
	IFRC	http://www.ifrc.org/
	Unicef	http://www.unicef.org/

Web development companies	http://www.webhostingsearch.com/web-design-companies.php
Another list with ranking	http://tinyurl.com/Top10bestwebhosting

Table B Website development companies examined

Commercial	
Name	URL
VrinSofts	http://www.vrinsofts.com/
ISPG	http://www.ispg.co.uk/index.html
Logo Design PROS	http://www.logodesignpros.com/web-it/
Dubai net solutions	http://www.dubainetsolutions.com/
Jatech	http://www.jatech.ca/
Ipage	http://www.ipage.com/ipage/index.html
Freeware	
Name	URL
Wix	http://www.wix.com/
Webs	http://www.webs.com/
Moonfruit	http://www.moonfruit.com/
Web Start	http://www.webstarts.com/
Ucoz	http://www.ucoz.com/
Weebly	http://www.weebly.com/
Imcreator	http://imcreator.com/
Official site builder	http://www.officialsitebuilder.com/
Byet	http://byethost.com/
X10hosting	http://www.x10hosting.com/
Freehostia	http://www.freehostia.com/index2.html
Biz.ly	http://www.biz.ly/
Freehostingeu	http://www.freehostingeu.com/
Biz.NF	http://www.biz.nf/

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Enhancing Knowledge Marketplaces Through the Theory of Knowledge Measurement

David G. Schwartz

Abstract This chapter discusses the creation of objective measures for the comparison of different types of knowledge repositories (KR) to enhance the linkage between knowledge management and strategic e-business with a specific focus on knowledge marketplaces. Knowledge repositories proliferate yet our ability to objectively assess the value and suitability of a given knowledge repository for a given task has much remained in the realm of trial and error. Knowledge marketplaces can help organizations leverage the wealth of information gathered through e-business activities. The field of knowledge management has grown significantly over the past decade yet we are lacking formal methods through which knowledge management resources can be measured. In order to facilitate such measures, and enable more effective use of knowledge marketplaces, we must first deal with comparing the value of different types of knowledge in an organizational setting and how such value is measured in and reflected by knowledge repositories. In this chapter we present the background and definition of the problem, and introduce an approach based on semantic calculus and set theory to create a theory of knowledge measurement. We then discuss how a theory of knowledge measurement (TKM) can be applied to knowledge marketplaces improving the linkage between knowledge management and strategic e-business.

Keywords Knowledge repositories · Knowledge management · Information quality · Metrics · Ontology · Measurement · Knowledge value · Knowledge quality · Semantics

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1 Introduction

When faced with decision problems, tight deadlines and multiple organizational knowledge systems users typically follow a *path of least resistance* to finding what is *perceived* to be the *most relevant* knowledge needed for their decision making (Anderson et al. 2001; Culnan 1983; Gerstberger and Allen 1968; O'Reilly 1982; Shah and Oppenheimer 2009). Knowledge marketplaces suffer from lack of objective valuation functions limiting their acceptance and organizational use (Brydon and Vining 2006; Kafentzis et al. 2004). It has been well-established that decision making based on poor or incomplete information will result in poor decision making and adverse organizational consequences (Anderson et al. 2001; Culnan 1983). Yet if five different organizational systems contain important pieces of information that could help, but each system has a different interface, different types of knowledge, different media types, and different levels of verification, how is a decision-maker to focus his or her efforts? How can one determine which system or knowledge repository (KR) is most worth our knowledge seeking efforts? How can values be assigned to KR contents facilitate active knowledge marketplaces for the trading of knowledge both within and external to an organization?

Knowledge management (KM) is the discipline encompassing the tools, techniques, and processes for the most effective and efficient management of an organization's intellectual assets (Davies 2000). In the modern organization, knowledge management is generally implemented through or supported by one or more Knowledge Management Systems (KMS). Knowledge management systems, defined by Alavi and Leidner (2001) as the "IT-based systems developed to support and enhance the organizational processes of knowledge creation, storage/retrieval, transfer, and application" generally act on or manage a series of knowledge repositories which form an organizational memory "…based on the combination of two main components: (1) a knowledge base which contains the content of knowledge that is of value to the organization; and (2) a well-defined set of meta-knowledge which is used to determined how and when knowledge or content should be applied." (Schwartz 1999). Figure 1 illustrates the relationship between these three levels.

Knowledge management has long been recognized as holding the potential to be leveraged by e-business activities by helping evaluate what type of work firms are doing in the e-business environment; better understand how those processes work; and help determine why certain processes and organization will continue to undergo change (Fahey et al. 2001). E-business activities continue to grow and produce larger and more sophisticated bases of knowledge upon which business decisions can be based. This type of problem will increasingly appear as systems that catalog and track unstructured information proliferate. Even with federated search across organizational knowledge repositories (Asher et al. 2013), the results presented may show relevance to a user's query but provide no objective indication as to the value of the knowledge repository from which it was drawn. The link between KM, e-business, and business processes has been explored by many (Fahey et al. 2001; Helms et al. 2008; Kafentzis et al. 2004; Lin and Lee 2005;

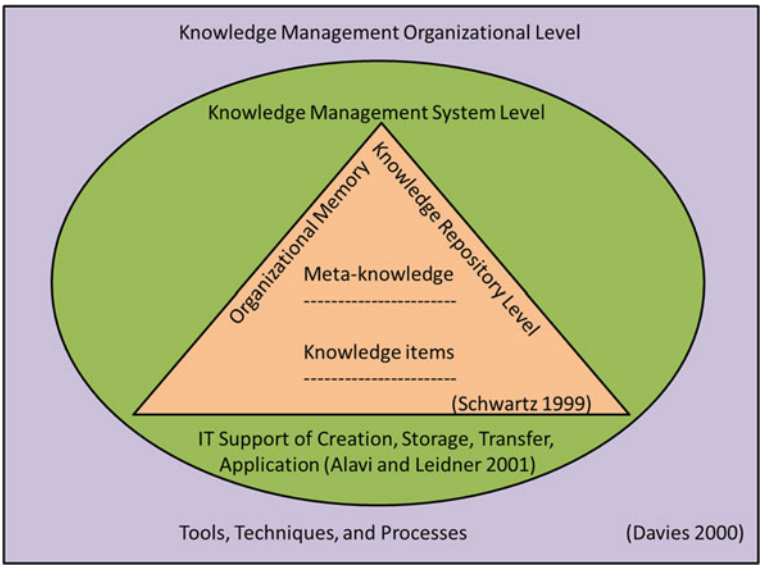

Fig. 1 KM levels

Mentzas and Apostolou 2001; Oppong et al. 2005) yet in exploring those links little attention has been paid to how different types and qualities of knowledge can be reconciled. In this article we will revisit a number of the links drawn between KM and e-business and show how those links would benefit from a formal theory of knowledge measurement.

As the types of knowledge stored in repositories and accessed through Knowledge Management Systems becomes increasingly diverse, we must develop measures of comparison and indices that can take into account this diversity. Many metrics based on facets of knowledge have been investigated (Abecker et al. 2003) but without regard as to how those metrics can be reasoned over in assessing the value of knowledge repositories. In this chapter we discuss the need for and implementation of a theory of knowledge measurement (TKM). In presenting the TKM requirements we present the example of a semantics-based knowledge-comparison function—a mechanism by which diverse knowledge repositories may be measured and compared. An example illustrating how the function can be applied to e-business strategy is given.

2 Motivation

As the well-worn management adage states, “If you can’t measure it, you can’t manage it”. It is surprising, therefore, that such little attention has been given to concrete methods for measuring the core element of KMS, the knowledge itself.

One of the significant shortcomings of knowledge management systems as identified by Davies (2000) is the lack of sophisticated *search* techniques that go beyond keyword-based retrieval to actually consider the semantic nature of the knowledge repository being queried and interrelationship between multiple knowledge entries within a repository. The importance of *semantic search* extends beyond individual knowledge management systems and should be addressed across multiple KMSs both within and between organizations (Davies et al. 2003). *Search* is a logical as well as practical starting point for the introduction of semantic services to knowledge management systems. However, the mere presentation of semantic search results without a fundamental understanding of the nature and value of the different repositories from which these results are drawn leaves us without the ability to support our search results with objective measures of their importance and usefulness. We believe that measures of semantic equivalence, importance, and significance of knowledge drawn from multiple KRs must be explicitly represented by systems and provided to users. The same science of semantics that enables semantic search in the first place provides us with a powerful tool that can be applied to accomplish these goals.

How have collections of knowledge—today's repositories—traditionally been compared? Over the past decade conventional library resources (CLS), once the bastion of knowledge repositories, have undergone fundamental changes and comparing the effectiveness of CLS to resources such as Google Scholar, Summon, or EBSCO Discovery Service is difficult (Asher et al. 2013; Brophy and Bawden 2005). In the past we were able to compare two library collections on the basis of the number of books held; compare two marketing databases on the basis of number of products covered; or compare two financial systems on the basis of number of equities covered; and of more recent relevance, compare two search engines on the basis of pages crawled. As long as the primary method of representation within these systems was textual or numeric, there was a measure of comfort provided by the fact that we were comparing apples with apples and oranges with oranges. But once an organization begins to accumulate large and diverse bases of e-business knowledge there is a need for management-friendly metrics to help assess the types and quality of that knowledge. The specific need for better evaluation of the nature of knowledge being stored by KRs is identified by Jennex (2006) as a KMS critical success factor.

3 Related Work

3.1 Knowledge Value Measurement

Our work follows in the spirit of Pirolli and Wilson (1998) and Reich (1992, 1995) who focuses on the theory underlying measurement and its application to knowledge valuation. Reich proposes the construction of meaningful objective

knowledge measures that go beyond just the desirable properties of measures such as reliability or validity. He also touches upon formally expressing the relationship between such measures which is the focus of our Theory of Knowledge Measurement. Stranieri and Zeleznikow (1999) build on Reich's approach noting that evaluations of knowledge systems are often done without regard to theoretical concepts associated with the nature of measurement and the identification of appropriate evaluation strategies. Pirolli and Wilson (1998) describe a class of measurement models that enable consideration both of observed user behavior and objective knowledge metrics. The above work found its application in the area of intelligent agents and knowledge-based systems. We seek to extend some of those developments into the area of knowledge repository measurement which can then be applied to the collection of e-business knowledge and its sharing through knowledge marketplaces.

Kankanhalli et al. (2011) highlight the importance of a user's perception of the value of knowledge within a given repository by measuring what they term 'perceived knowledge repository capability'. That work measures the users' perception of the relationship but does not suggest or investigate how factors influencing such perception might be objectively measured. A measure of may be a first step towards establishing useful and objective metrics.

3.2 Knowledge Equivalence

Knowledge equivalence as defined by Weinberger et al (2007) refers to determining the equivalence of the individual knowledge of learning partners. As their work deals with individual human learners, tests applied to measure knowledge equivalence are relatively straightforward—tests completed by the learners can be compared to measure equivalence. We are extending the concept of knowledge equivalence to encompass knowledge held by two different knowledge repositories.

Woolridge (1996) addresses knowledge equivalence in intelligent autonomous agents by suggesting equivalence exists when both agents have the same information and are thus the knowledge they provide would be indistinguishable. Such an approach to knowledge equivalence may be achievable with engineered artificial agents but is not feasible for the comparison of independent knowledge repositories in an organizational setting.

Indicators of knowledge equivalence such as content ratings and credibility measures have been investigated by Poston and Speier (2005). These relate to individual knowledge items and not the overall value of a given repository. The work we describe can serve as a basis to extend the measures proposed by Poston and Speier (2005) to create applied comparison mechanisms.

Transactive memory theory (Weigel et al. 2012) builds on the importance of identifying the location of the highest quality knowledge and discovering methods through which that quality can be measured and shared.

Much work has been devoted to measuring the value of a firm's intellectual capital (Bontis 2001; Hsu and Mykytyn Jr. 2006). That work focuses primarily on knowledge effectiveness and the relationship between knowledge and the bottom line.

3.3 Knowledge Quality

Knowledge quality has been widely identified as an important component in the creation and assessment of knowledge repositories and management systems (Chung and Galletta 2012). Most research deals with determining a measure of *perceived quality* (Yoo 2012) such perception based on different forms of user survey.

Surveying a wide range of previous work that includes (Burton-Jones et al. 2005; Holsapple and Joshi 2001; Jarke et al. 1999; Kwan and Balasubramanian 2003), Rao and Osei-Bryson (2007) collect a set of test measures for knowledge quality in KMS. They produce a list of seventeen quality dimensions ranging from a*ccuracy* to *traceability*. However their analysis, and by reference the underlying literature, deals primarily with the quality of an individual piece of knowledge. The sole foray into the realm of the complete knowledge repository—termed *codified knowledge retainer* in that work—are to the two dimensions of *degree of context* and *security*. Rao and Osei-Bryson (2007) effectively conceptualize the need for knowledge quality dimensions at the repository level. We believe that the work we present below extends this from the conceptual level into a formal theoretical framework through which knowledge repository quality can be measured and compared.

3.4 KM Metrics

In a well-cited survey of knowledge management metrics, Bose (2004) calls for standardized metrics to quantify knowledge and convince management as to the value of KM initiatives yet finds little concrete research being done in this area. Those initiatives identified in (Bose 2004) focus almost exclusively on financial, customer, or process measures from an accounting perspective and do not go down a level to address objective measures of the underlying knowledge repositories. Similar problems and results are identified by Kankanhalli and Tan (2004) and were more recently reported by Bolisani and Oltramari (2012).

Our goal is to extend the three research streams of *knowledge value measurement, knowledge quality* and *knowledge equivalence* to develop a theory of knowledge measurement that will equip us with both theoretical metrics and practical tools to measure and express elements of knowledge quality and make statements of knowledge equivalence that can be reasoned over. The metrics of knowledge repositories which reflect different facets of the knowledge stored therein can become powerful indicators of both knowledge relevance and quality.

One of the primary applications of such a theory is in helping assess and guide the e-business value of knowledge repositories. The weakness of the links between knowledge management, knowledge repositories, and e-business has been discussed by many (Apostolou et al. 2004; Fahey et al. 2001; Helms et al. 2008; Kafentzis et al. 2004; Oppong et al. 2005; Shin 2004). We believe that TKM will provide managers with an important toolkit through which such linkage can become clearer, stronger, and more valuable. But before the practical value of such measures can be tested, they must first be formalized. In the remainder of this chapter we will focus on defining the framework for the theory of knowledge measurement and its potential application to knowledge marketplaces.

4 A Theory of Knowledge Measurement

Before discussing the business decision environment for TKM, we will briefly introduce the main elements of the theory and do so through the example of one TKM function—knowledge comparison. A knowledge comparison function is used to determine the extent of knowledge equivalence providing an indicator of preference between repositories.

The uses of knowledge comparison functions are many. Given the choice between two related but not integrated knowledge management systems, how can one a priori select which system to query? As inter-organizational knowledge management efforts evolve, how does one determine which organization or unit within an organization has the preferred KR for a given topic? How can one assess the e-business value of knowledge repositories? Let us first consider the following two concepts:

Knowledge Equivalence between Repositories: The problem of establishing *knowledge equivalence* between *repositories* is determining where *n* knowledge items in repository 1 (KR1) have an equivalent decision or informational value as *m* knowledge items in repository 2 (KR2).

Knowledge Equivalence between Topics: The problem of *knowledge equivalence* between *topics* is determining where *n* knowledge items on topic 1 have an equivalent decision or informational value as *m* knowledge items about topic 2. This can be used to determine the suitability of a given knowledge repository, KR1, to address different topic areas. For example, information about Machine-A in KR1 may include a service history, parts-list, costing tables, and customization requests. Information about Machine-B in that same repository may include a blueprint, digital images, an operator simulation, and sales history. Does KR1 have an equivalent amount of knowledge about the topics Machine-A and Machine-B?

In order to further this discussion and lead towards functional tools to assess and compare knowledge equivalence, we begin by presenting the concept of a representative subset. We then describe a *knowledge comparison function* and show how it can be used to describe and assess relative significance across knowledge and information systems.

4.1 Representative Subsets

A representative subset is defined in (Schwartz 1997) as follows:

> A representative subset s of S, is a subset that retains a qualitative distribution identical to that of the full set with respect to a certain property of S. For example, t, a subset of the set of positive integers I = {0,1,2,3,4,5,6,7,…} is a representative subset with respect to (wrt) parity (even/odd) only if it has the same proportion of odd versus even numbers as does the full set. Thus, t = {5,11,39,8,100,72} is a representative subset of I wrt parity whereas g = {5,11,39,103,21,4} is not.

Let us extrapolate our numeric example to *K*, the set of Knowledge as represented in a knowledge repository. Let each element of *K* be assigned an attribute called its knowledge-category *Ck*. The knowledge-category attribute provides a qualitative description of each element in *K*, much the same as parity can be used to describe an integer.

A set *k* will be a representative subset of *K* wrt knowledge-category if and only if *k* has the same properties of knowledge-category distribution as does *K*.

4.2 The Knowledge Comparison Function

In order to provide a test for representative subsets of knowledge, we define the knowledge comparison function. The knowledge comparison function s(*c*, *S*, *y*) is defined to return the relative significance of *c* within set *S* with respect to property *y*. Given the set of knowledge, *K*, we can define a function s(*c*, *K*, *y*) which returns the relative significance of a knowledge element *c*, within the set of knowledge *K*. A subset *k* of *K* is a *representative subset* wrt *y* if: s(*c*, *k*, *y*) = s(*c*, *K*, *y*).

Referring back to our numerical example, we can now say:

{s(*c*, t, parity) = s(*c*, *I*, parity) = 0.5} <==> t is a representative subset of *I* wrt parity since it retained the distribution of odd–even numbers whereas,
{s(*c*, *g*, parity) <> s(*c*, *I*, parity) = 0.5} <=> g is not a representative subset of *I* wrt parity since it did not retain the distribution of odd–even numbers.

4.3 Relative Significance Within a Knowledge Repository

Within a given knowledge repository, we may be interested in determining whether a technician diagnosing a problem with Machine-A will find an equivalent amount of information to that which a manager pricing support contracts for Machine-B will find. This is expressed as:

$$\mathrm{s}(\text{Machine}-\text{A}, K,\ \text{knowledge}-\text{category}) = \mathrm{s}(\text{Machine}-\text{B}, K,\ \text{knowledge}-\text{category})$$

This statement gives us an indication as to the tendency of a specific information resource with respect to certain categories of knowledge. It is completely justifiable to claim that a given knowledge repository is science-specific, legal-specific, or medical-specific. Few, if any, extant information resources need adhere to the standard set by the above expression, but we would expect an internal organizational knowledge management system to have and report such measures. Even if there is no objective reason that a given knowledge repository should contain the same amount of information on Machine-A as it does on Machine-B.

4.4 Relative Significance Across Knowledge Repositories

Far more interesting is determining the relative significance of Machine-A versus Machine-B in two different knowledge repositories, KR1 and KR2 thus giving us a basis for valuing knowledge repositories in a knowledge marketplace. How much confidence do we have in the following statements?

1. s(Machine-A, *KR1*, knowledge-category) = s(Machine-A, *KR2*, knowledge-category)

The relative significance of Machine-A in KR1 is equivalent to the relative significance accorded to Machine-A in KR2.

2. s(Machine-A, *KR1*, knowledge-category) = s(Machine-B, *KR2*, knowledge-category)

The relative significance of Machine-A in KR1 is equivalent to the relative significance accorded to Machine-B in KR2.

And in general, how confident are we that:

3. s(*x*, *KR1*, knowledge-category) = s(*x*, *KR2*, knowledge-category)

The relative significance of any knowledge item in KR1 is equivalent to the relative significance of that item in KR2.

Proving (1), (2), or (3) with respect to specific knowledge repository gives us a valuable insight into the nature of those resources and the potential for bias if the KM systems are used improperly.

4.5 Measures of Significance

In the above examples we have limited our measure to the use of *knowledge category*. The structured nature of many knowledge management systems, such as CODE4 (Skuce and Lethbridge 1995) make it easier to utilize meta-knowledge fields, such as knowledge-category used above, in implementing knowledge comparison functions. The choice of which meta-knowledge to use, however, is not a trivial one. In the CODE4 system alone there are nine different semantic element categories describing knowledge items that could be considered. However, even when considering structured systems, existing measures and metrics are sorely inadequate (Liebowitz 2001) though progress in identifying them has been made by Abecker et al. (2003). The choice of semantic categories which should be used as input into the knowledge comparison functions described is non-trivial and must be the focus of further research.

5 Discussion: TKM and Knowledge Marketplaces

A knowledge marketplace is a place where knowledge is traded. Kafentzis et al. (2004) discuss a number of strategic issues pertinent to the linkage between knowledge marketplaces and e-business. They conclude that in order for knowledge trading between organization to become a reality "well-defined meta-data that will provide a clear description of knowledge assets and its attributes are necessary". The use of TKM in establishing the next generation of knowledge marketplaces is therefore fundamental to frameworks such as the Knowledge Trading Framework described in their work.

Other factors influencing knowledge market failure are discussed by Brydon and Vining (2006). Perceptions that knowledge isn't valuable and the lack of adequate measures are identified by Matson et al. (2003) as key factors in the failure of knowledge markets. We cannot effectively trade that which we cannot effectively value and assess.

Issues such as the relative value of individual knowledge items, for example a schematic diagram versus a service history, have yet to be addressed in the organizational knowledge management literature. Some work related to this is being done in the comparison of ontologies (Maedche and Staab 2002), but that is limited to formal descriptions of knowledge items. This too will become an integral part of the meta-data available in knowledge marketplaces.

An approach that combines case-based reasoning with metadata descriptions has been used in the INKASS system (Apostolou et al. 2004) to support the development of a knowledge marketplace. In that case, the metadata is used to describe the actual knowledge on offer and not at a higher level to assess the value or quality of a knowledge repository. The TKM approach, being based on semantic calculus, has the advantage of being able to represent metadata from systems such as INKASS.

5.1 Examples of TKM Usage

Just as the set of Integers can be described in many ways other than on the basis of parity, (i.e. Prime numbers; Numbers divisible by 3; 4-digit numbers etc.) so too knowledge repositories with growing multimedia content can be compared on the basis of the various types of content that they provide. Potential frames of reference for such systems are, for example, *ImageType* and *SoundType*.

Rewriting the knowledge comparison functions discussed earlier within this frame of reference will let us address questions such as:

$$s(x,\ KR1,\ ImageType) = s(x,\ KR2,\ ImageType)$$

The relative significance of Images in KR1 is equivalent to the relative significance of Images in KR2.

In other words, which KR is better suited for use when images are most desirable in the decision making process, either due to the nature of the decision, or the specific preferences of the user.

And;

$$s(x,\ KR1,\ AudioType) = s(x,\ KR2,\ AudioType)$$

The relative significance of audio recordings in KR1 is equivalent to the relative significance of audio recordings in KR2.

Given the above, a useful comparison of two KRs that claim to deal with Machinery for the organization would be:

$$s(Machine{-}A,\ KR1,\ ImageType) = s(Machine{-}A,\ KR2,\ ImageType)$$

i.e. Do KR1 and KR2 have an equivalent levels of image knowledge regarding Machine-A?

5.2 Choice of Metrics for Knowledge Marketplaces

Developing and implementing metrics such as those describe above to describe complete repositories can enable meaningful trade and transactions in knowledge marketplaces. Additional metrics should be drawn from the knowledge marketplace literature to reflect the desired information that would enhance this trading. Knowledge category, image type, and audio type have been described above. Other potential metrics include: Knowledge domain, industry, content richness, source reliability, and source reputation (Kafentzis et al. 2004; Matson et al. 2003); Knowledge quality; knowledge actuality, and validation (Apostolou et al. 2002, 2004); validity, credibility, and usage (Poston and Speier 2005); context, community, domain, history, evaluation, application, transition, business, and security (Abecker et al. 2003). Each of the above facets are target metrics which can be reasoned about in TKM knowledge repository statements.

6 Conclusions and Future Work

Knowledge repositories have become an important part of organizational information systems. KRs present challenges related to metrics and the evaluation of just how useful and complete the knowledge stored may be. Measuring the value of knowledge within a system is extremely difficult and the relevant and required facets have been address by many researchers. We have set the basis for a theory of knowledge measurement that allows us to reason about measures and discussed ways to assess how well suited a given KR may be to specific categories of knowledge and problem areas.

By focusing on the question of knowledge equivalence between repositories we have taken steps toward a formal solution and provided a mechanism for evaluation we presented the concept of a representative subset. Using representative subsets as a basis to define the knowledge-comparison function gives us a tool that can be used to evaluate relative knowledge content within a particular KR, or more importantly between two distinct KRs. The knowledge comparison function is the first element that we have proposed in what will be a comprehensive theory of knowledge measurement. The conceptual guidelines and functional descriptions that we have presented must be addressed through implementation. Future development of more precise measures of *knowledge equivalence* and variants on the knowledge comparison function may also enable a more accurate comparison of general search results, enabling the improvement not only of organizational knowledge utilization but of Internet search results as well.

By applying TKM to knowledge marketplaces we can strengthen the tenuous connection between the wealth of knowledge being collected through e-business and the organizational use of that knowledge through marketplaces.

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Part IV.1
Emerging Issues, Trends and Opportunities: e-Business Issues and the Social Web

Web 2.0 and Digital Business Models

Bernd W. Wirtz, Linda Mory and Robert Piehler

Abstract The increasing acceptance and prevalence of the Internet as a modern information and communications technology has advanced the commercial use and enabled the development of digital business models. Since 2005, increasing Internet services can be noted in this context, that can be associated with the phenomenon of Web 2.0 and that changed the Internet Economy (Wirtz 2010, p. 328). This paper analyses the strategic implications of the changes of digital business models through Web 2.0. For this reason, Internet business models are first classified based on the 4C-Net-Business-Model typology (Wirtz 2000; Wirtz and Lihotzky 2003, p. 522), then the term Web 2.0 is defined and an empirically validated model of explanation regarding strategically relevant components of the Web 2.0 is shown (Wirtz et al. 2010). Using these components, the influence of Web 2.0 on single Internet business models is explained. Thereby, various Web 2.0 applications are assigned to the business models. Moreover, the effect of individual Web 2.0 components towards the applications is explained and implications for practice are derived.

Keywords Web 2.0 · Social media · Business models

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1 Introduction: Business Models on the Internet

The business model is a holistic management approach that reflects the fundamental value creation logic, value creation architecture and the functioning of a company (Timmers 1998). Here, various sub-models can be considered, which can be assigned to the strategic domain, the customer and market domain or the value creation domain. Since the late 1990s business models have evolved to an established management tool, and accordingly have gained an increasing importance within the scientific literature (Ghaziani and Ventresca 2005, p. 543; Wirtz 2011a, p. 6 et seq.).

For further analysis, a structuring of the different business models on the Internet makes sense. For the B2C sector, four basic business models can be identified on the Internet which are characterized by different service offerings. Since these encompass the areas Content, Commerce, Context and Connection, the classification is considered as 4C-Net-Business-Model typology (Wirtz 2000, p. 218). The individual sections are designed to exhibit a high degree of heterogeneity among themselves, but internally to possess of preferably homogeneous elements. The typology thus corresponds to a holistic approach and therewith forms the majority of business activities on the Internet as a prototype. In practice there are often hybrid forms of these prototypes in the appropriate service offerings which are known as hybrid or integrated business models (Friedman and Langlinais 1999, p. 38). Nevertheless, the typology can be applied in these cases as well, to draw conclusions from the combination of several areas or to place an emphasis on the strategic orientation. An overview of the 4C-Net-Business-Model typology is shown in Table 1 (see in the following Wirtz 2011b, p. 445 et seq.).

Internet business models, which consist primarily of the area of *Content*, focus its activities on the collection, selection, systematization, processing and distribution of information. These are allocated on their own online platforms. The central value proposition in this type of business model is the user tailored access to relevant content. Revenues are generated through advertising, subscriptions and charges for individual content. The variants of the content business model are distinguished by their different accents of entertainment and information services. The Wall Street Journal online is an example of a company that focuses on this type of Internet business model.

In contrast, the Internet business model *Commerce* focuses on the initiation, support or handling of business transactions. A market platform that provides both sellers and buyers an efficient environment, in this context consequently represents the value proposition. Revenues will be achieved either directly through sales or as an intermediary through commissions. Further differentiation of this type of business model is possible through the different phases of a purchase transaction which are supported by the online platform (initiation, negotiation, implementation). Amazon is an example of a company for the Commerce model which both attains direct sales revenues as well as commissions from its marketplace platform.

Internet companies that specialize in the *Context* type of business model are characterized in their value creation mainly through the aggregation, sorting and

Table 1 The 4C-net-business-model typology

	Content	Commerce	Context	Connection
Definition	• Companies that archive, select, compile, distribute or present content online	• Companies that initiate or handle business transactions	• Companies that sort and aggregate information	• Companies that provide physical or virtual network infrastructure
Value proposition	• User friendly and convenient access to various content	• (Cost-)efficient market platform for sellers and buyer	• Reduction of intransparency and complexity for users	• Requirements for exchanging information over the Internet
Forms of revenue	• Advertising • Subscriptions • Pay-Per-Use	• Sales Revenue • Commissions	• Advertising	• Advertising • Subscriptions • Time-/Volume-Based Billing
BM-variants	• E-Information • E-Entertainment • E-Education • E-Infotainment	• E-Attraction • E-Bargaining/-Negotiation • E-Transaction	• E-Search Engines • E-Web Catalog	• E-Intra-Connection (community) • E-Inter-Connection
Examples	• Wallstreet journal online	• Amazon	• Google	• Intra: Facebook • Inter: Vodaphone

processing of information. Thereby, the central value proposition is the reduction of intransparency as well as complexity between various Internet offers to the user that are manifested for example by a shorter information processing task. To a great extent revenues are achieved through advertising and as alternatives of the business model the search engine and catalogue approach is available. Google is an example of a company that uses the Internet business model type Context.

Internet business models whose value creation is primarily focused on the provision of physical or virtual network infrastructure are assigned to the category *Connection*. This infrastructure provides the requirements for exchanging information over the Internet as a key value proposition. Basically it can be distinguished between two variants of this business model. First, there are Intra-Connection providers that provide communication services within the Internet and in the broadest sense feature a community-concept. On the other hand, there are Inter-Connection companies that primarily establish and merchandise access to the physical networks. Revenues are realized in the Connection business model through advertising, subscriptions or time- or volume-based billing. Facebook is an example of a company that is primarily characterized by Intra-Connection and Vodafone is an example of the Inter-Connection model.

2 Web 2.0 as a Game-Changer

Since 2005, in the context of Internet offers, a sustainable trend has evolved. There was a growing number of platforms and services that have a novel combination of existing web technologies and are characterized by a high degree of participation, networking and social interaction in their service offerings. This phenomenon is referred to as Web 2.0.

The term can be traced back to Eric Knorr as well as Dale Dougherty and Craig Cline, who used it in late 2003 or early 2004. In public, the concept was finally established in 2005 by a widely noticed article of O'Reilly (O'Reilly 2005). To date the scientific definitions of Web 2.0 are heterogeneous (Song 2010, p. 249 et seq.). Nevertheless, a number of basic dimensions, such as platforms, networks or participation, can often be found in the literature (Koh et al. 2007; Park 2007). Taking into account subject-oriented, goal-oriented and functional aspects the following definition can be derived: Web 2.0 includes innovative applications and platforms across the Internet, which exhibit a high creative potential. By actively shaping the content and the cooperation between users and providers as well as users among one other, social networks are created that serve the permanent networking of users and the distribution of content (Wirtz 2010, p. 328 et seq.).

Companies using traditional Internet business models, need to respond to these changes and make appropriate adjustments, because the business sector of the Internet is a high-velocity market. In particular, a systematic analysis of the key trends, influences, and changing user expectations is the starting point for a successful implementation.

2.1 The Web-2.0-4-Factors-Model

For structuring and evaluation of relevant changes that are induced by Web 2.0 in Internet business models, the Web-2.0-Factor-Model can be used. It includes four key dimensions of impact, which consist of several sub-factors: Social Networking, Interaction Orientation, Customization and Personalization as well as User-Added Value. Through technological advancements and changes in the expectations of Internet users, these four factors have become increasingly important for Internet business models. They stand close to each other in a substantive connection as regards content, so that a clear-cut delineation is not always easy to establish. The Web-2.0-4-Factors-Model is shown below in Fig. 1.

The construct *Social Networking* includes concepts that describe the structures of the direct interaction between Internet users. The relevant services are aimed at a preferably durable connection of users that are reached by the treatment of specific topics, the mapping of real-existing kinship and familiarity levels and assessment tools. Social Networking generates various benefits for the users, including opportunities for self-reflection, image building, maintenance and access to important information. The relevant trends in this area include the four subcategories: Social Trust (Valenzuela et al. 2009), Social Identity (Gangadharbatla 2008), Virtual Word of Mouth (Dwyer 2007; Vilpponen et al. 2006) and Customer Power (Constantinides and Fountain 2008). These categories are further explained in Table 2.

The second important factor in Web 2.0 is referred to as *Interaction Orientation*. This construct describes the ability of a company to establish an authentic dialogue with customers on the basis of individual interactions and to obtain these (Ramani and Kumar 2008) and therefore encompasses interactive phenomena

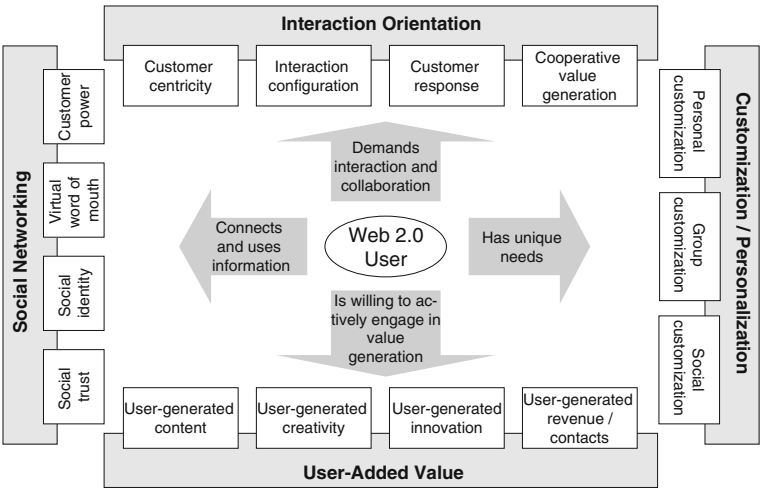

Fig. 1 Web-2.0-4-factors-model (Wirtz et al. 2010, p. 279)

Table 2 Categories of social networking

	Definition
Social trust	• Denotes the trust of Web 2.0 users in reciprocal interactions that are based on participation and control • Examples: Wikipedia, product reviews online
Social identitity	• Denotes the image-management and membership in social groups on the Internet, aiming at social reinforcement and self-realization • Examples: Second Life, group function at Facebook
Virtual word of mouth	• Refers to the informal transfer of information between various stakeholders through Internet applications • Examples: blogs, review sites, e-mail
Customer power	• Refers to the increasing influence of consumer opinions on decision making in companies • Examples: open innovation, evaluation of support requests

Table 3 Categories of interaction orientation

	Definition
Customer centricity	• Denotes the central focus of business activities on the customer's perspective • Implies organizational change processes in order to simplify customer interaction • Examples: Amazon order transaction
Interaction configuration	• Refers to the structure of the interaction possibilities of a company • Includes types of information, responsibilities and standardized procedures (routines, codes of conduct) • Examples: Dell support
Customer response	• Refers to a company's ability to perform customer dialogue • Response patterns for individual customer feedback and the collection of relevant data to improve customer dialogue are essential components • Examples: Amazon product recommendations
Cooperative value generation	• Refers to a company's ability to integrate the customer into business transactions as equal partners • Develop and maintain a customer-based competitive advantage through direct information to improve the service offerings • Examples: Apple App Store

between companies and customers. This ability is made up of four components: Customer Centricity, Interaction Configuration, Customer Response and Cooperative Value (Ramani and Kumar 2008). These are summarized in Table 3 and an example of each is illustrated.

The factor *Customization/Personalization* of the Web-2.0-4-Factors-Model displays adjustment phenomena as well as segment-accurate alignment and consists of the sub-categories: Personal, Group and Social Customization. These constructs capture the opportunities to customize service offerings on the Internet (Kumar 2007). Here, the contextual focus goes beyond similar considerations in the context of e-business and information system. The individual components are shown in Table 4.

Table 4 Categories of customization/personalization

	Definition
Personal customization	• Refers to the ability to customize Internet offerings to meet specific needs and preferences of the user • Examples: Avatare in communities
Group customization	• Denotes adjustment possibilities of Internet offerings by groups • Examples: rankings of service offerings through users
Social customization	• Designates service offerings on the Internet that are used to represent membership in social groups • Examples: Second life

Table 5 Categories of user-added value

	Definition
User-generated content	• Designates Internet user-generated content of diverse characteristics that can be used for information or entertainment • Examples: profiles, websites, videos
User-generated creativity	• Refers to user feedback to improve business processes, service offerings and organization • Examples: Open Innovation (product and process innovation)
User-generated innovation	• Refers to innovation processes outside the company which are related to the company's service offerings • Examples: Open Software
User-generated revenue/contacts	• Denotes the expansion and optimization of the service offerings of a company by the inclusion of users as entrepreneurs with the help of a platform • Examples: App stores

The last factor of the Web-2.0-4-Factors-Model is called *User-Added Value*. This construct reflects the growing importance of value adding by the customer. Herewith, it is a series of phenomena that are being discussed intensively in the literature (Franke et al. 2006; Füller et al. 2006; Bilgram et al. 2008; Daugherty et al. 2008; Strube 2011). Table 5 shows the individual sub-categories.

The interplay of the components of the Web-2.0-4-Factors-Model result in a number of specific implications for the Internet business models according to the 4C-Net-Business-Model approach. These are presented in the next section.

2.2 Impact of the Factors on Internet Business Models

The four Web-2.0-Factors have a different meaning of success for individual Internet business models. Therefore, they are evaluated separately using the 4C-Net-Business-Model types. In this context the allocation is based on conceptual considerations and the analysis of existing Internet services. Table 6 presents the results in an overview.

Table 6 Impact of the Web-2.0-factors on Internet business models (adapted from Wirtz et al. 2010, p. 285)

Web-2.0-factors / Business models	Social networking	Interaction orientation	User-added value	Customization / personalization
Content	◕ • Value offering model • Distribution model	◑ • Value generation model • Distribution model	◕ • Sourcing model • Value offering model	◕ • Value offering model • Distribution model
Commerce	◔ • Value offering model • Distribution model	◕ • Value generation model • Distribution model	◑ • Sourcing model • Value offering model	◑ • Value offering model • Distribution model
Context	◑ • Value offering model	◔ • Value generation model • Distribution model	◑ • Sourcing model • Value offering model	◑ • Value offering model • Distribution model
Connection	◕ • Value offering model	◑ • Value generation model • Distribution model	◑ • Sourcing model • Value offering model	◑ • Value offering model • Distribution model
Explanation:	○ No effect	◔ Low effect	◑ Moderate effect	◕ High effect	● Very high effect

In the Content business model a high or very high relevance emerges for all four Web-2.0-Factors. Thus, Social Networking affects for example the service offerings as well as distribution. By integrating Social Networking tools like blogs and chats, on the one hand, the core content is expanded and on the other hand the reach is enhanced in the outreach. They can also be used as a means of maintaining customer relationships. Interaction Orientation affects companies in the Content sector mainly in the service generation and distribution. Direct customer contact and the corresponding ability to integrate customer feedback adequately is of relevance to each stage of value creation. The most important influencing factor for Content-based business models on the Internet is presented by User-Added Value. Thereby, user-generated content can serve as a source for the own content platforms but also expand the whole range of services by user-generated innovation/creativity. An example of this is the integration of Twitter responses as a complement of opinion leaders in news items. In addition, the area of Customization/Personalization also has a major potential influence on Content business models. The customization of the presentation of content and segment-specific alignment of content improves the perceived value of content.

In Commerce-based Internet business models, however Interaction Orientation is referred to as the most important influencing factor. In this context the ability to tailor the service generation and distribution processes to the customer is considered as a differentiator with competitors. This is particularly relevant for long-term customer loyalty. However, aspects of the Customization/Personalization can be used for differentiation of service offerings of a Commerce Internet business model. Especially in light of the increasing mass orientation of Internet trading and related services, these two aspects constitute the starting point for potential competitive advantages (Artefact Group 2008). For example, the success of

Amazon was influenced extensively by the use of intelligent product recommendation algorithms that shorten the search process of the customer as well as influence personalized request lists, and simplify the ordering process (one-click-checkout, shopping cart metaphor). User-Added Value is especially relevant for Commerce business models in the context of innovation. Crowdsourcing and co-creation are the corresponding phenomena which are used to explain this impact. However, the importance of User-Added Value is not as high as in the Content business models because it is only relevant to one part of the value creation logic.

Internet business models from the field of Context can benefit from the developments in Web 2.0 by focusing primarily on Social Networking and Customization/Personalization. One example is the search engine market leader Google which increased the user loyalty and the average time a user spends on the site, by the introduction of the social networking platform Google+ as well as the ranking of search results through the function +1. In addition, through individualized search results a stronger value proposition is established.

Intra-Connection-based business models on the Internet are particularly affected by the phenomenon of Social Networking. While classical Intra-Connection providers have offered special one-to-one communication, such as e-mail or instant messaging, in their service offering, many-to-many communication has gained a stronger meaning through Web 2.0. In addition, for Intra-Connection providers also Customization and Personalization are relevant. Hotmail, the e-mail service from Microsoft, is an example of this. In 2005 the service was incorporated into the larger Windows-Live-platform, which offers e-mail and contact management as well as messenger-support and interfaces for the integration of social networks like Facebook or LinkedIn. Companies pursuing business models in the Inter-Connection area, however, should focus on the area of Interaction Orientation. In particular, strongly complex products in the categories of triple or quadruple play require a responsive pre-and after sales communication with fast reactions.

Overall, it can be stated that companies that have an Internet-based core business, should constantly scan their environment for new trends and developments. Thereby, technological developments are relevant, but especially changes in user behaviour need to be paid close attention. The willingness to recognize changes and further develop these as a source of competitive advantage should be anchored at all levels of the company. In this context, the integration of innovation that occurs outside the company is of major relevance, for example through Open Innovation. In addition, a basic knowledge about the business model and appropriate structures and processes for an effective change management within the company, are the prerequisite for further development. Especially in the implementation phase of business model modifications or redevelopment, a high demand for supporting management activities is given.

3 Applications of Web 2.0 Business Models

In Web 2.0 a number of new interactive applications and tools are developed, each providing different customer value. They are based on a combination of various existing Internet technologies with the aim to improve the communication within the network. In scientific publications different classifications of Web 2.0 services or applications have been established. Early approaches often used the type of content or the functionality of the service as a classification criterion (e.g. Kolbitsch and Maurer 2006). Constantinides and Fountain identified five basic categories of Web 2.0 applications on a more abstract level: Blogs, Social Networks, Content Communities, Forums and Content Aggregators (Constantinides and Fountain 2008, p. 233). Hoegg et al. also incorporated a business model perspective, which leads to three superordinate classes. These classes are based on case study research and can be identified as Community, Platform/Tools and Online Collaboration (Hoegg et al. 2006, p. 8). However, these dimensions are not mutual exclusive. In summary it can be stated that the different classification approaches of Web 2.0 applications are quite heterogeneous. Based on these considerations Web 2.0 applications, their service offerings and their benefits are shown in (Table 7) with reference to the approach of Constantinides and Fountain, who proposed "a basic classification based on application types divided into five main categories: Blogs, Social networks (Content) Communities, Forums/bulleting boards, Content aggregators"(Constantinides and Fountain 2008, p. 233).

Blogs are a form of chronological web diaries which are mostly issue-oriented or individual-related and are equipped with commenting features as well as journaling. Moreover, also link collections, and What's-New areas may be part of a Weblog. Interaction takes place through comments and links to other blogs. In contrast, File Exchange and Sharing comprise platforms spreading multimedia content. Well known examples are YouTube for videos, Flickr for images or Slideshare for presentations. The offers are supplemented by comments and subscription features that enable interaction with users.

In connection with modern technology-based knowledge management, as a Web 2.0 application Wikis have gained particular importance. They constitute a set of web-based tools for content creation as well as further development in groups. Thus, their orientation is on the publishing and sharing of knowledge. Podcasts, however, provide topic-oriented audio or video information that can be updated automatically through a subscription feature. Their characteristics are very similar to those of Weblogs.

Mash-Ups can be categorized as a kind of meta-offer. They allow the user-specific data integration and sharing of different service offerings on Web 2.0. For example, address data from the contacts application of the social network Windows Live can be displayed directly within the platform on a virtual map of Microsoft's search engine provider Bing Maps. On the contrary, tagging

Table 7 Overview of Web 2.0 applications (Enderle and Wirtz 2008, p. 37; Constantinides and Fountain 2008, p. 233)

	Service offering	Customer value	Categorization by Constantinides and Fountain 2008
Blogs and RSS—Feeds e.g. Blogger.com	• Provision of an authoring tool for creating blogs • Hosting of blogs • Categorization of blogs	• Unfiltered and personal publishing opportunity for "everyone"	Blogs
Podcasts	• Topic-specific audio and video content • Possibility of a subscription	• Location and time unbound consuming of content • Automatic update	
Social networking e.g. Facebook.com	• Self-presentation of the users • Linking among users • Linking of users and content	• Mediation of social contacts through virtual interaction	Social networking
File Exchange & Sharing e.g. Youtube.com	• Provision of online storage • Systematization of content, such as by categories and ratings	• Broadcasting for "everyone" • Provision of an audience	
Wikis e.g. Wikipedia.com	• Tools for creating and editing of content by users • Provision of a platform for searching and presenting information/knowledge	• Aggregation of topic specific information • Freedom regarding the contents and authors • Users as a collective editorial	Content communities
Review Sites e.g. Ciao.com	• Aggregation of product information • User-generated product reviews • Price comparison with links to online stores	• Independent product reviews from users • Simplification and support of decision–making and purchase process	Forums/Bulleting boards
Mash-Ups e.g. Windows Live	• Combination of basic data (mostly maps) with additional information (addresses, pictures, events, etc.)	• Added value by linking related information	Partly content Agregators and others
Tagging e.g. del.icio.us	• Central archiving and ubiquitous availability of bookmarks • Tagging of bookmarks • Access to collections of links from other users	• Individual editorial processing of the Internet	

applications target editorial processing of lists of favorites and links through the Internet users. Thereby, meta-information is generated and shared with other users.

Social Networking is one of the most important Web 2.0 applications. Services are subsumed under this term, that provide platforms for social interaction as well as information exchange and that are aimed at the networking of users. Examples of this are Facebook and Twitter. Frequently, user profiles, chat systems, group functions, comment functions, and interfaces to transfer information from external sources, such as game consoles, are deployed. Review sites are however mainly focused to specific topics. The central function of the user integration and interaction is the creation and evaluation of feedback on service offerings of companies. For that purpose, comment functions and comparison lists are primarily used. In the next section the importance of each Web-2.0-Factor for specific applications is explained.

4 Influence of Web-2.0-Factors on Applications

The various Web 2.0 applications are characterized by the strategic characteristics of Web 2.0 in varying degrees. Table 8 summarizes this and in the following examples are used for further explanation.

In the areas of Social Networking and Interaction Orientation Blogs and RSS Feeds have only a limited creative potential. They can, for example, be used for virtual word-of-mouth campaigns or as part of the interaction configuration. In the field of User-Added Value, a wide range of user-generated content offerings can be integrated within this instrument. The possibilities for personalization are however small. File Exchange & Sharing platforms are used primarily for the dissemination of user-generated content and the extraction of user know-how. Here, comment functions and evaluation systems are available as well as possibilities for social interaction. Although these are used very often, the degree of interaction is not overly strong. Due to the possibility of a topic-specific selection of platforms the ability to personalize is given.

Because Wikis are used as participatory knowledge storage tools, their strengths lie in the areas of User-Added Value and Interaction Orientation. In particular, the utilization of user know-how is paramount. Social Networking and Customization can be used with this application, however limited. Podcasts, given their mass-media-sized structure, have almost no interaction potential. They allow only simple forms of individual customization. Hence its importance in Web 2.0 is classified as increasingly low.

Mash-Ups also exhibit a low interaction potential for companies. The integration of interfaces to other Internet service offerings, however, may represent an added value for its own offer. Thus, a map extract of Google Maps broadens the offer of an address search provider. In the area of Mash-Ups are especially interfaces to services with high added value such as Google Maps, and interfaces to Web 2.0 services with a high number of users, such as Facebook, of relevance.

Table 8 Impact of the Web-2.0-factors on Internet business models (adapted from Wirtz et al. 2010, p. 285)

Web-2.0-instruments \ Web-2.0-factors	Social networking	Interaction orientation	User-added value	Customization / personalization	Overall evaluation
Blogs & RSS Feeds	• Low capacity for dialogue	• Low interaction possibilities	• User reviews • User-generated content	• Rather address the "masses"	
File Exchange & Sharing	• Partial capacity for dialogue	• Frequent interaction between companies and users	• User-generated content • Extraction of user know-how	• Specific communities enable individualized approach	
Wikis	• Capacity for dialogue hardly given	• Users as a collective editorial	• User-generated content • Extraction of user know-how	• Rather address the "masses"	
Podcasts	• No user-dialogue	• No interaction	• No user added value	• Subscription of podcasts individually allocable	
Mash-Ups	• No user-dialogue	• No interaction	• Low user added value	• Few options available for customization	
Tagging	• No user-dialogue	• No interaction	• Low user-generated content	• Individual editorial processing of the Internet	
Social Networking Communities	• Company-participation • Dialogue with users	• Strong interactions between the company and users	• User reviews • Media uploads	• Alignment of service offers to customer needs possible	
Review Sites	• Capacity for dialogue hardly given	• Reviews only from the customer side possible	• User reviews	• No options available for customization	
Explanation:	○ No effect	◔ Low effect	◑ Moderate effect	◕ High effect	● Very high effect

Tagging and Social Bookmarking applications are particularly important in the area of Customization/Personalization. Within this application, however, there is a low impact potential on the part of the company.

Social Networking communities like Facebook or Twitter, utilize all Web-2.0-Factors. They also represent the most commonly used instrument. The strategic direction of the Internet business model to this application also requires a consideration of additional content and services, in order to create real customer value that goes beyond a static web page. For companies, Review Sites such as Google Shopping are especially relevant in the field of User-Added Value as the possibility to analyze customer feedback is given. Additionally, support activities may also be executed on these platforms.

In summary, it can be stated that for a successful alignment of Internet business models in the context of Web 2.0, an integrated use of various applications is necessary. Thereby an adequate customer benefit is created for all Web-2.0-Factors. In this context the following points summarize the central findings of this contribution:

- Through the four strategically relevant factors of Web 2.0, Social Networking, Interaction Orientation, User-Added Value and Customization/Personalization, Internet business models are subjected to peer pressure.

- Thereby, different types of Internet business models have a different sensitivity to influencing factors.
- For the use of the Web-2.0-Factors a number of different applications and tools are available.
- The applications/tools can in terms of their effects also be assigned to the Web-2.0-Factors in varying degrees.
- A successful strategic alignment of Internet business models therefore postulates an integrative set of applications/tools–depending on the type of business model.

5 Managerial Recommendations

The environment of a company has a significant impact on which business models lead to a successful value creation on a specific market. Since in a variety of industries a high level of continuous environmental change is given, the ability to recognize these changes and to adapt the business model accordingly or further develop it is the foundation for a sustainable competitive advantage. As an example, this paper has shown how the phenomenon of Web 2.0 affects Internet business models and which action parameters for adaptation are available.

Web 2.0 was conceptually divided into sub-characteristics and transferred into a management-oriented evaluation system. This was done on the basis of the specific influences. Thus, various trends and developments in the field of Web 2.0 and social media can be classified with respect to their relevance for Internet companies. In addition, practical applications have been presented and evaluated, which can serve as a reaction pattern for the integration of Web 2.0 characteristics into existing Internet business models.

Firstly, marketers have to analyze the core aspects of their business model and choose the most important aspects of a potential Web 2.0 strategy accordingly. After this step an evaluation of the best suited Web 2.0 applications and instruments follows up. Therefore existing Web 2.0 applications have been classified and matched with basic Web 2.0 characteristics in this paper. This allows marketers to adjust their Web 2.0 online campaigns according to strategic key aspects and increase campaign success in terms of impact. However, besides the evaluation processes discussed, which are primarily related to value generation, options of value capture have to be considered as well.

Secondly, an adjustment between the perceived environmental changes and the individual aspects of the affected business model can be made with the help of the discussed Web 2.0 assessment tools. The aim is to identify market opportunities and challenges early on, in order to anticipate countermeasures through the modification of the business model. However, this requires an exact knowledge of the business model, which is facilitated by systems such as the 4C-Net-Business–Model typology and a clear image of potential competitors and their Web 2.0 activities. The structured analysis of the core aspects of the business model makes it easier to respond to environmental changes appropriately.

A final important aspect of managerial practice is the tracking of the implementation status of the business model modification, which is relevant for the successful application of the concepts. In particular, changing business processes and organizational structures require an extra degree of enforcement and control by the responsible managers. The corresponding resources should be considered in the planning process. Overall, the tools presented in this paper allow an early detection of relevant fields of action in the context of Web 2.0 for Internet business models and support the decision-making to adapt the business model accordingly.

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Rethinking Social CRM Design: A Service-Dominant Logic Perspective

Hong-Mei Chen and Stephen L. Vargo

Abstract The rapid rise of powerful social customers has drastically changed the e-business landscape. Social CRM (SCRM) emerged in late 2009 as an e-business strategy for companies to enable customer relationship management (with social customers) utilizing social technology. Despite the many applications that are labeled as SCRM, there is a dearth of guidelines for SCRM design and development. Many companies are trapped using social media as just another communication channel, and have naively applied traditional Electronic CRM (ECRM) practices on social platforms based on a model of exchange that centers on goods (e.g., goods-dominant logic or G-D logic), with value created by the firm and relationship implying multiple transactions of value-laden output. G-D logic might have served companies in the pre-Web 2.0 environment in which the interaction with customers could be contained in one-to-one, closed, well-defined channels. However, in a collaborative open, social environment in which interactions cannot be contained and are often unpredictable, this firm-centric, transaction-oriented approach is at odds with how social customers behave and expect, and therefore becomes inadequate in fostering true relationships that cultivate devoted advocates and brand co-creators. In this chapter, we offer an alternative logic called service-dominant (S-D) logic for SCRM design to meet new challenges. S-D logic is based on the reciprocal application of applied competences (service), which sees relationship in terms of co-creation of value. We argue that the S-D logic perspective for SCRM is appropriate, if not essential. We offer S-D logic-informed strategies for SCRM and next-generation CRM system design.

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1 Introduction

We are in the midst of a radical global technological and economic transformation. The fast proliferation and wide-adoption of Web 2.0 technologies have given rise to a new class of customers, called social customers. More than four in five US online adults now participate socially. Facebook, founded in 2005, already has more than 1 billion active users. Twitter, a micro blogging site, has close to 500 million registered accounts and 250 million active users. Social customers are technologically empowered, digitally resourceful, and globally connected. They can access large amount of information never imagined before by a quick finger tap on their iPhones or a click on their iPad. They have digital "friends" or "circles" or communities with whom they can influence personally or get advice/recommendation from or collaborate. They are more sophisticated, demanding, impatient and fickle than ever before (Chen and Vargo 2008). The extent of their power in the business ecosystem has become apparent, as evidenced by the explosion of web-based reputation systems, and user communities. Many companies see tremendous opportunities in harnessing the social technology to build relationship with this new class of customers. As such, Social CRM (Customer Relationship Management), or SCRM, has emerged in late 2009 and become the latest chapter of Electronic CRM (ECRM) initiatives.

However, SCRM is yet to be fully utilized as a tool in improving customer relationship—which is believed to eventually drive profitability—as companies are still trying to understand this new type of customer and are adapting to the new social commerce environment. The context of SCRM today is drastically different from the pre-Web 2.0 era in many ways. In particular, the interaction space on social media cannot be controlled by the firms as they did in the past with well-defined, one-to-one channels, such as phone calls to call centers. There are no more "channels" in social media, only touch points: Customers are interacting with many companies and "friends" in different platforms *simultaneously*. Furthermore, the speed of eWoM (word of mouth) is unprecedented: social customers can become a firm's free promoters or brand destroyers; their likes/dislikes can spread virally and instantly. For example, a United Airline customer complaint went viral on YouTube (titled 'United Breaks Guitars') and was estimated to have cost the airline $180 million (Huffington post 2011). The fast real-time ripple effect of brand damage raised urgent needs to address the challenges of SCRM design and implementation.

Despite the many applications that are labeled as SCRM, there is a dearth of guidelines for SCRM design and development (Greenberg 2010). Many companies are trapped, using social media as just another communication channel, and have

naively applied traditional ECRM practices on social platforms. This approach, if oriented in what is called goods-dominant (G-D) logic (Vargo and Lusch 2004, 2008) is likely to be met with great disappointment. G-D logic refers to a design foundation built upon the model of economic exchange, which views units of output, embedded with value in the production process, as the central components of exchange. This G-D logic design thinking is firm-oriented, transaction-based and sees customers as an exogenous to the value-creation process. As such, firms are "targeting," "segmenting" and marketing "to" (instead of "with") the customers. Customer loyalty is equivalent to repeat patronage in this G-D logic. This G-D logic might have served companies in the pre-Web 2.0 environment where the interaction with customers could be contained in one-to-one, closed, well-defined channels. In a collaborative social environment, however, this firm-based, transaction-oriented approach is at odds with how social customers behave and expect, and therefore becomes inadequate in fostering true relationships that cultivate devoted advocates and brand co-creators.

Changes in the social commerce context necessitate companies to expand their thinking beyond the goal of optimizing a two-way relationship between an enterprise and a customer (e.g., one-to-one interaction via closed, well-defined channels) to include the simultaneous interactions that customers have among themselves and with other companies including their competitor companies on social platforms, which we term "many-to-many" interactions in the service ecosystem. Companies are required to think beyond customer satisfaction measures to think about how to cultivate true value co-creators and advocates through reciprocal relationships in this new SCRM environment. This calls for a different perspective on SCRM design than the traditional firm-centric, goods-based logic.

In this chapter, we offer an alternative logic, called service-dominant (S-D) logic, (Vargo and Lusch 2004, 2008) for SCRM design to meet these new challenges in the open, socially competitive environment. S-D logic calls for a genuine reconnection to the original roots of CRM, focusing on the "C"—Customer—and the "R"—Relationship. It also embraces a process orientation ("service"—the use of one's resources for another's benefit), rather than an output orientation ("goods and services"). It recognizes that all social and economic actors are resource integrators and makes the customer endogenous to value creation by arguing that value is always co-created with customers (and others), rather than unilaterally created by the firm and then distributed. In a S-D logic perspective, relationship is a characterization that captures the networked, interdependent, co-creative nature of value creation through reciprocal service provision (Vargo 2009). This is precisely the perspective that is appropriate for SCRM development.

In what follows, Sect. 2 will first examine the new context of SCRM and its differences from traditional ECRM, which motivates a different design thinking from traditional G-D logic. Section 3 will compare G-D logic and S-D logic in greater detail. In Sect. 4, we portray SCRM as transitioning from G-D logic informed ECRM to S-D logic informed ECRM. Section 5 presents S-D logic informed system design implications on SCRM development. Section 6 provides the conclusion of the chapter and future research directions for SCRM system design.

2 SCRM: The Changing Landscape

Social CRM, as the name implies, was broadly and loosely defined to integrate CRM technology and social platform capabilities to engage customers and optimize customer experiences to drive profitability (Greenberg 2010). Since its conception in late 1990s, ECRM, or simply CRM, appeared to be at the core of strategic initiatives for businesses to compete profitably (Chen and Chen 2004). It is well-recognized as information-technology (IT)-enabled relationship marketing (Ryals and Payne 2001). The premise of ECRM is that customer equity (Rust et al. 2004) is the key to increasing enterprise value and customer equity is a partial function of customer relationships. Social CRM continues ECRM's central practice of using IT to enable relationship management. It is also called CRM 2.0 by some, mirroring its underlying technology—Web 2.0—which enables virtual communities and collaboration on a scale never seen before.

2.1 Evolving SCRM

The differences between traditional ECRM and SCRM contexts and goals are shown in Table 1 and described below. It is important to note that SCRM is a continuous evolution of ECRM and that SCRM is still evolving.

Business Philosophy: SCRM continues the philosophy of ECRM to use IT to enable customer relationship.

Technology Base: Traditional ECRM uses Web 1.0 technology in facilitating customer relationship-building (e.g., to attract and retain profitable customers) while SCRM is enabled by Web 2.0 technology.

Process: There are five broad technological "engines" used in a traditional ECRM system including: information storage engine (database or data warehouse), customer segmentation engine, personalization engine, multi-channel broadcast engine, and transaction engine (Microstrategy 2001). These five engines support four generic CRM processes (IDIC): Identification, Differentiation, Interaction, and Customization (Peppers and Rogers 2004). The difference is that in traditional ECRM the IDIC processes are internal, and transaction-based and can be easily applied in well-defined, firmed controlled channels while SCRM has dynamic customer-driven processes wherever touch-points the customers happens to be active. For instance, a customer may complain about a brand on a blog, or help solve another customer's problem on Facebook through an iPhone app or may provide a product review on YouTube.

Interaction place: Traditional ECRM typically engages customers in one-to-one interaction via well-defined channels, such as email, phone calls, direct marketing, a company website, or face-to-face in physical stores. In a SCRM context, "many-to-many" interactions in the service eco-system are typical, where customers simultaneously interact with many other customers and other companies

Table 1 Traditional ECRM vs. Social CRM

	Traditional ECRM	SCRM
Business philosophy	IT-enabled relationship marketing	IT-enabled relationship marketing
Technology base	Web 1.0	Web 2.0; social technology
Process	Transaction based: one-to-one interaction	Interaction based: dynamic; many-to-many interaction
Interaction place	Defined channels: email, phone calls, websites, stores, etc	Dynamic customer-driven touch-points realized in social media
Segmentation	Traditional demographics	NA
Broadcast message flow	Push-based; inside-out	Pull-based; outside-in
Control	Firms	Social customers
Design/Analysis scope	Internal focus	Company value chain
Data store	360° customer transaction data	All interactions or conversations across all touch points; user contributed contents
Data analysis	Subject-oriented analysis	Network analysis
Metrics	Transaction-based	Interaction-based
	Customer life-time value (CLV)	Customer referral value (CRV)
	Share of market	Share of voice
	RFM analysis measures	Size and engagement of communities, sentiment
Viral marketing	NA	Can easily develop a viral marketing campaign
Crowd sourcing	NA	Integral part of SCRM strategy
Customer loyalty	Static; repeated patronage	Dynamic; eWoM; advocacy

(including competitor companies) on social platforms. As such, there are no well-defined "channels" for interaction but dynamic, customer-driven touch-points realized in social media.

Segmentation, **Broadcast Message flow**, **Control**: Traditional ECRM segmented customers' transaction data for campaigning/customization and broadcasted messages from firms to customers including phone calls, email, TV ads; these are pushed-based communications. A SCRM system does not usually segment customer data, as it is less meaningful or effective. In the SCRM context, message flow is often pull-based, such as through a Really Simple Syndication (RSS) feed or by having customers follow companies on Twitter or "like" companies on their Facebook pages. The company is no longer in control of the process; the social customers are:

Design/Analysis scope, **Data Store**, **Data analysis**: Traditional Analytical CRM is based on advanced data warehousing and mining technology to offer a 360° view of customers (based on transaction data) that allows profiling, personalization, customization and making recommendations for cross- or up-selling. These are subject-oriented techniques of data warehousing technology, in which

each item of customers' transaction data can be a "subject." Many systems for personalization are in use for ECRM in general and SCRM as well but many more, new analytical tools mining social data have been developed, combining web crawlers technology and, for instance, deep packet inspection (DPI) of social customers' click stream behavior across all touch points at ISP levels. The data of interest are not transaction-based only, they focus on customer network effects, interactions, conversations, sentiment, advocate behaviors, customer contributed content, etc.

Metrics: New metrics are being called for and are rapidly emerging. In traditional ECRM, quantitative measures such as Recency, Frequency, Monetary (RFM) or Customer Lifetime Value (CLV) analysis based on transactional data are common but these are not suitable for SCRM. SCRM is more interested in, for instance, how influential a customer is among his or her community—Customer referral value (CRV). Also of interest are share of voice, size and engagement of communities, and sentiment (like or dislike). Many commercial SCRM technology companies, such as IBM, now offer a range of new metrics (Forrester 2010).

Viral Marketing, **Crowd sourcing**, **Customer Loyalty**: Viral marketing campaigns are easier to achieve with SCRM technology. Instead of, or in addition to, repeat patronage, social customers provide electronic word of mouth (eWOM); their advocating for a brand is viewed as a sign of customer loyalty. Crowd sourcing strategies such, as collective product reviews and the creation of new products, can be affected by SCRM technologies to achieve lower operation costs and greater innovation for companies.

2.2 Need for a New Design Thinking

Although SCRM aims to foster outcomes from good relationship marketing practices and the social technology provides ample opportunities for open dialogue to engage and co-create with customers, many SCRM initiatives have nonetheless fallen short. This is because some companies are unable to adjust their design thinking for the new social, Web 2.0 context. There are two major reasons for this.

First, some companies see the new social platform as just "another" communication channel. We have seen that the one-to-one "channel" approach is at odds with how social customers communicate and act in their networks. Without changing their design thinking, the companies' messages are *pushed* to customers on social media, just like in traditional ECRM in the Web 1.0 era. The pushed messages run the great risk of being perceived as lacking in perceived sincerity (O'Malley and Mitussis 2002; Mitussis et al. 2006). Customers' reaction on the social world is unpredictable. For example, McDonald sent two tweets with the hashtag "McDStories" to customers, which were hijacked by customers and the messages were changed not in the way McDonald has expected or hoped for (Huffington Post 2012). This firm-centric approach of pushing messages, grounded in G-D logic, renders their SCRM efforts ineffective. This is because customers are

not seen as value-creation partners; they are seen as outside the company and processed as transactions, rather than cultivated for value-creating relationships. Moreover, the perceived insincerity can spread virally and damage their brand image more quickly and widely than ever before.

Second, many managers view SCRM, like traditional ECRM, as a technological magic bullet that will dramatically improve their bottom line. ECRM has not been the panacea that many had hoped (Kale 2004; Newell 2003). It is clear that IT does not create relationships or customer advocacy. It is, arguably, a necessary condition, but not sufficient for ECRM or SCRM success. Despite the lessons from traditional ECRM failures in past years, companies view SCRM as yet another new technology to be implemented without fundamentally rethinking the ways they do business in the new social commerce, multi-dimensional network context.

To take advantages of the new social technology, and thus to enable authentic (social) customer relationship management, we believe that companies must approach their design from a different perspective: away from G-D logic, and towards S-D logic. We will more clearly discern the differences between G-D logic and S-D logic in the next section and offer a S-D logic informed approach for SCRM design in Sect. 4.

3 Service-Dominant Versus Goods-Dominant Logic

In this section, we will examine two fundamentally different perspectives on the concept of service(s), which is at the heart of customer-centricity and relationship (Berry 1983). In fact, the notion of customer relationships originated in service marketing. One perspective views goods (tangible outputs embedded with value) as the primary focus of economic exchange and "services" (usually plural) as either (1) a restricted type of (intangible) good or (2) an add-on that enhances the value of a good. Vargo and Lusch (2004, 2006) call this logic goods-dominant (G-D) logic. Others have referred to it as the "neoclassical economics research tradition" (Hunt 2004), "manufacturing logic" (Normann 2001), "old enterprise logic" (Zuboff and Maxmin 2002), and "marketing management" (Webster 1992).

Irrespective of the label, G-D logic points toward using principles developed to manage goods production to manage services and relationship "production" and "delivery." That is, in G-D logic, services are intangible units of output and relationships are defined in terms of repetition in selling these units to a given customer. Thus, ECRM based on G-D logic becomes more of an operation-centric, transaction-based, efficiency "machine" to process "customers" as "goods."

This G-D logic perspective predictably leads to relatively superficial attempts at a "relationship," such as addressing customers by name, personalizing written communications, and cross selling, which, while a step beyond mass-marketing, fall short of true relationship building. Thus, while these activities sometimes lead to convenience-based repeat purchases, they often do not build emotional loyalty with customers based on more effective value creation or co-creation.

The second perspective of exchange and marketing considers "service" (singular)—a process of doing something for another party—in its own right, without reference to goods, and identifies service as the primary focus of exchange activity. Vargo and Lusch (2004, 2008) call this logic service-dominant (S-D) logic. S-D logic is captured in the following 10 foundational premises (FPs):

- FP 1: Service is the fundamental basis of exchange. The application of operant resources (knowledge and skills), "service," as defined in S-D logic, is the basis for all exchange. Service is exchanged for service.
- FP 2: Indirect exchange masks the fundamental basis of exchange. Because service is provided through complex combinations of goods, money, and institutions, the service basis of exchange is not always apparent.
- FP 3: Operant resources are the fundamental source of competitive advantage. Goods (both durable and non-durable) derive their value through use—the service they provide.
- FP 4: Goods are a distribution mechanism for service provision. The comparative ability to cause desired change drives competition.
- FP 5: All economies are service economies. (Note that "service" is singular). This is only now becoming more apparent with increased specialization and outsourcing.
- FP 6: The customer is always a co-creator of value. This implies value creation is interactional.
- FP 7: The enterprise cannot deliver value, but only offer value propositions. Enterprises can offer their applied resources for value creation and collaboratively (interactively) create value following acceptance of value propositions, but cannot create or deliver value independently.
- FP 8: A service-centered view is inherently customer oriented and relational. Because service is defined in terms of customer-determined benefit and co-created, it is inherently customer oriented and relational.
- FP 9: All social and economic actors are resource integrators. This implies the context of value creation is networks of networks.
- FP10: Value is always uniquely and phenomenologically determined by the beneficiary. Value is idiosyncratic, experiential, contextual, and meaning laden.

These FPs are extensively described elsewhere (Vargo and Lusch 2004, 2006, 2008); we provide only a brief summary here. As pointed out in FPs 1-5, goods continue to play an important service-delivery role, at least in a subset of economic exchange. As described in FP1, the most important foundational proposition of S-D logic is that organizations, markets, and society are fundamentally concerned with the exchange of service—the applications of competences (knowledge and skills) for the benefit of a party. That is, service is exchanged for service; all firms are service firms; all markets are centered on the exchange of service, and all economies and societies are service-based. In contrast to implying the modification of goods-based models of exchange to fit a transition to service, S-D logic provides a service-based foundation based upon service-driven principles.

As described in FP6-FP9, S-D logic recognizes that value is (co)created collaboratively, rather than being a property of goods that are created by the firm and distributed to "consumers," (value destroyers), as in G-D logic. Thus, the service provided (directly or through a good) by the firm is only input into the value (co)creating activities of the customer. As described in FP9 and shown in Fig. 1, before value can be realized, that input must be integrated with other resources, some of which are also obtained through the market and some of which are privately (e.g., personal, friends, family) or publically (e.g., government) provided.

Thus, value creation is always an interactive process that takes place in the context of a unique set of multiple exchange relationships. Hence, value creation is mutual and reciprocal (i.e., service is exchanged for service), almost by definition. That is, not only does the firm provide inputs for the customer's value-creating activities but the customer does the same for the firm, usually somewhat indirectly, through money. But customers co-create value with firms in additional ways, such as by enhancing brand and relationship equity for the firm, either directly through their purchasing or indirectly, through influencing the attitudes, the making of meanings, and the behavior of others toward the firm.

Most important to SCRM development, it is through interactive, collaborative, unfolding and reciprocal roles in value co-creation that S-D logic conceptualizes relationship. Co-creation and service exchange imply a value-creating relationship or, more precisely, a complex web of value-creating relationships, rather than making relationship an option. In S-D logic, this meaning of relationship is punctuated in FP8. In the S-D-logic ecosystem view, actors are connected, directly or indirectly, and become dependent and interdependent through a web of relationships that extend beyond traditional notions of the transaction and economic exchange. Although disquieting to some, firm activity and value (co)creation must

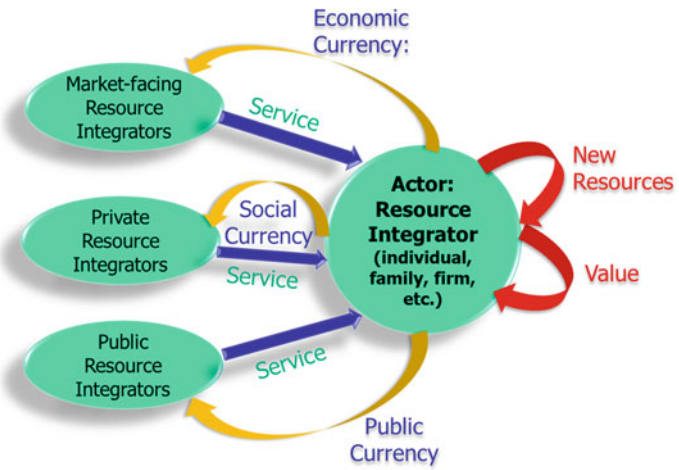

Fig. 1 The S-D logic actor: Co-Creating through resource Integration & Service Exchange (Vargo and Lusch 2014)

be understood in the context of relationships among a complex web of actors (customers, employees, suppliers and other stakeholders) that transcend transactions (single or repeated). S-D logic, with its focus on relational, collaborative, systemic value creation, driven by resource integration and mutual service provision, points toward the need to approach relationship management in terms of dynamic service ecosystems (Vargo 2009), as depicted in Fig. 2. In this context, firms and customers are *both* resource integrators involving service exchanges in complex, multi-level networks.

Critical to SCRM implementation, at the very minimum, S-D logic suggests the following transitional shifts to move from a goods focus to a service focus:

1. From thinking about the purpose of firm activity as making something (goods or "services") to a process of assisting customers in their own value-creation processes.
2. From thinking about value as something produced and sold, to thinking about value as something co-created with the customer and other value-creation partners.
3. From thinking of customers as isolated entities, to understanding them in the context of their own networks.
4. From thinking of firm resources primarily as operand—tangible resources such as natural resources—to operant—usually intangible resources such as knowledge and skills.
5. From thinking of customers as targets, to thinking of customers as resources.
6. From making efficiency primary, to increasing efficiency through effectiveness.

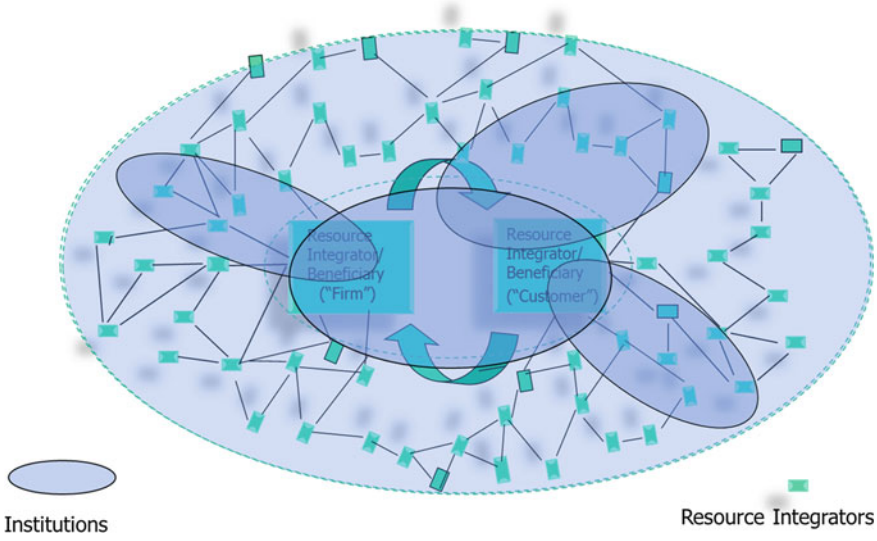

Fig. 2 Resource Integration & Service-for-Service Exchange within Service-Ecosystems (Lusch and Vargo 2014)

4 SCRM at a Cross Road

Table 2 summarizes the difference in influences on ECRM from these two different perspectives detailed in the previous section: G-D logic versus S-D logic. SCRM is depicted to be at the crossroad of these two approaches: G-D logic informed ECRM and S-D logic informed ECRM.

As summarized in Table 2, the major differences between G-D logic informed ECRM and S-D logic informed ECRM are in the strategic orientation, data or information scope, value definition, relationship base, process, product/services, and system design focus. In most deployments of the G-D logic based ECRM, social or emotional engagement is exploited for near-term financial gain, whereas a central implication of a S-D logic perspective of ECRM is that the creation and maintenance of the "relationship" might be as important as the creation and maintenance of financial transactions. The S-D perspective understands customers

Table 2 G-D logic informed ECRM versus S-D logic informed ECRM

	G-D logic informed traditional ECRM	SCRM at a cross road	S-D logic informed next generation ECRM
Strategic Orientation	• Firm-centric • Operation-centric	• Firm-centric • Operation-centric • Conversation-centric	• Customer-centric • Customer as a partner • Value co-creation • Resources integration • Relationship and emotional experience
Data scope	Customer transaction data with the firm	Interaction in social media with the firm and other firms	• Customer in his/her context, networks • Interaction & feedback in service ecosystem
Value	• Firm produced • Value in exchange	Co-production	• Co-creation • Value in use • Value in context
Relationship base	• Repeat patronage • Output-production orientation	Social interaction "friends"	• Value co-creation • Positive experience • Reciprocation
Process	Discrete transaction	Discrete transaction with interface with customers' social networks	Customer's and firm's and partner's or competitor's processes integrated
Product/service	Mass-customization	Value-added services	Operant resources
System design focus	Efficiency	Efficiency	Efficiency through effectiveness

as active participants in complex, dynamic service eco-systems; it broadens the scope of customer data collection, views customers as resources, and taps into customers' networks for co-creation of value.

G-D logic informed ECRM only recognizes interactions by individuals in their role as customers, and only within the firm. In this view of ECRM, the data typically available to the firm is limited to transactions and communications between that firm and its customers. Yet, a customer will usually transact with multiple firms in a given industry. Previous ECRM system efforts do not incorporate details of transactions that a customer might have had with a firm's competitors. Even for operation-centric purposes, this lack of data severely limits a firm's portfolio of strategies for interacting with customers and the comprehensiveness and precision of the firm's suggestions and advice to customers. In a social commerce environment, S-D logic points out the importance of understanding customers in their own context and in their own network, not just within the value chains of the firm.

G-D logic informed ECRM has almost exclusively focused on integrating internal processes for the customers as opposed to S-D logic informed ECRM's inclusion of relationships with suppliers, competitors, intermediaries, as well as non-market-facing resources—public, personal, etc. SCRM helps to learn more about social customers and to increase utilizing social media to interact with customers in real time. Based on G-D logic, however, SCRM will actually expose the companies to *more* risks: risks of losing their customers as their expectations have dramatically changed. The interaction with customers has become more dynamic and customer/crowd behaviors have shown to be unpredictable in new social network environments.

G-D logic informed ECRM systems are generally concerned with emphasizing firm goals and profiling customers for retention and cross selling, rather than being concerned with customer desires. By contrast, S-D logic informed ECRM is highly customer-centric and can utilize systems, technologies, and processes to improve the customer's experience with the company, a practice conventionally referred to as Customer experience management (CEM). The aim is to manage the development of relationships with customers which evolve from their positive experience to loyalty and then to advocacy (Smith and Wheeler 2002).

To understand the differences in the two approaches to ECRM, it is useful to distinguish among the concepts of value-added, co-production, and value co-creation (see Table 2). The value-added perspective suggests that value is embedded in the firm's output and is thus independent of the customer's perceptions of value. This is clearly the G-D perspective. Co-production refers to participation in the core good (if any): product "finishing", product/service design and development using lead users, existing product/service adaptation based on customer feedback, mass customization, open community ideation for product design and development (Woodruff and Flint 2006). S-D logic informed ECRM is centered on customer-centric value co-creation—value-in-use and value-in-context (see FP1 and FP6)—which captures the fact that value creation occurs as the customer integrates firm resources with personal and other market-facing resources (FP9) and is therefore uniquely and experientially determined by the customer (FP10).

As already noted, developments in social technology have increased the salience of customer power. Customers now have vast social and economic networks, through which they are empowered by new opportunities for value creation and that they can use as for peer-to-peer influence (e.g., through wikis, blogs, social networks, virtual communities, etc.). Thus firms have new opportunities to involve customers and their "networks" as resources and collaborators in value creation, but only if they look beyond the customer as a (possibly repeat) purchaser of firm-created value. To capitalize on these opportunities, we argue that the S-D logic perspective for SCRM is appropriate, if not essential. The S-D logic perspective creates new challenges for SCRM development, including system design issues and new metrics for capturing the value of the firm to the customer and the customer to the firm. These and related issues are discussed in the following section.

5 S-D Logic Implications for SCRM System Design

S-D logic has the potential to influence SCRM design in a profound way while posing many design challenges that go beyond the traditional system-development scope. FP6, FP7, FP8, FP9 and FP10 have a direct impact on all phases of system development from requirements specification to implementation. System designers and IS researchers are challenged to develop new design methods for SCRM from the S-D logic perspective. We discuss design implications from each of the FPs. Traditional and S-D logic influenced ECRM system design is compared in Table 3.

FP6 (**the customer is always a co-creator of value**) challenges the theories and practice of system design by moving from viewing customers as external entities of the "system" to including customers as an integral part of the value co-creation "system". Note that the newer "agile" system development methods have included customers as part of the project team, they are, at best, seen as "co-producing", but not yet value co-creating. The view of the role of customers has also changed from static to dynamic and thus traditional segmentation and profiling techniques will have difficulty being effective in the new business environment as mentioned in the previous section. Importantly, the design extends "one-to-one" (one firm to one customer) (Peppers and Rogers 2004) customer modeling and analysis to "many-to-many" (many firms to many customers) (e.g., Gummesson 2006), or network-with-network (Vargo et al. 2008) design, in which the firm's networks (including competitors) and the customers' networks are modeled and analyzed. This can be compared to the traditional IDIC processes where needs are identified based on the static perspective of customers: the firm tries to "identify" known or latent needs and desires of customers through requirements solicitation techniques such as interviews, surveys and observations. Customers are then differentiated by needs and economic values. By way of contrast, a S-D informed ECRM (or SCRM) system design implies modeling both

Table 3 Traditional versus S-D influenced ECRM system design

S-D logic FP	Traditional ECRM design	S-D informed ECRM (or SCRM) design
FP 6: The customer is always a co-creator of value	• One to one design • Customer as external entities • Strict system boundary; static view of users/ customers and interaction process • Single-view of customer, focus on firm's processes • Requirements relatively well-defined	• Many-to-many design • Include customer competencies and networks • Fluid system boundary; dynamic service adaptation for customers • Focus both firms' and customers' processes and others • Analysis of the entire customer network • Shared information among customers, firms and networks • Some requirements unknown
FP 7: The enterprise cannot deliver value, but only offer value propositions	• Value presumed by firms • Firm internal process integration • Value configuration from firm's resources	• Value in context • Internal & external process integration in the customer's context • Dynamic value configuration with customers' network and supplier chains • Firm propositions as part of customer's value creation
FP 8: A service-centered view is inherently customer oriented and relational	• Treat repeat patronage as relationship • Shorter term economic benefit/value/ profitability measurement	• Treat relationship as core process in value creation • Longer term customer advocacy measurement; customers and their networks are co-creators of the brand
FP 9: All social and economic actors are resource integrators	• Firm competency and resources • Relative fixed design outcome or service innovation	• Including both firm's and customer's competencies and resources for value co-creation • Dynamic integration for personalization; end-to-end process integration • Capability of emergent outcome or unexpected service innovation
FP 10: Value is always uniquely and phenomenologically determined by the beneficiary	• Metrics: value assumed pre-determined (disconfirmation-based)	• Metrics for emergent concept of (co-created) value • Value measurement needs to be capture intangible, experiential, contextual, meaning-laden quality of interaction (dynamic) at each touch point • People, process, product (service) are integrated for each interaction

the customer's and the firm's competency and networks as well as the firm's competency and network to allow for dynamic service adaptation.

FP9 (**all social and economic actors are resource integrators**) influences ECRM design to view the firm's value propositions in terms of operant resources, which serve as inputs for customers' value-creating processes through resource integration. That is, firm resources (including those created by integrating firm network resources) and customer resources are dynamically integrated by the customer with other customer-accessible resources to co-create value. Unexpected service innovation is thus, not only possible, but likely. This extends the resource-advantage theory of competition (e.g., Hunt 2004) beyond the firm's resources and requires arraying customer resources in the "value configuration." This is considerably different from traditional ECRM design methods, which are often more goal-oriented and have a desired 'state' of outcome, and challenges SCRM designers to model emergent outcomes and be able to cope with the indeterminate design outcome.

Consistent with FP9, **FP10 (value is always uniquely and phenomenologically determined by the beneficiary)** implies the need for SCRM metrics based on emergent concepts of value, rather than metrics based on predetermined value standards (e.g., disconfirmation models). That is, value is always idiosyncratically determined by the customer; it is experiential, contextual, and meaning-laden and requires metrics compatible with the phenomenological nature of co-created value. It thus suggests that for SCRM, evaluation research needs to be extended beyond customer satisfaction and service quality measures. FP10 also suggests that the internal and external link between people, process and products/services must be integrated and adaptive to allow positive experience of dynamic value co-creation.

In sum, due to the rise of social customers and constant technological advances, a S-D informed ECRM (or SCRM) system design requires a change in strategic focus and a departure from traditional system design thinking. It needs to facilitate resource integration from *both* the customer's and the firm's perspectives and needs; the resources to be included may be in the firms' and/or the customers' networks. This heavy emphasis on resource integration across firm and customer boundaries requires a new technological capability of dynamic resource discovery, decomposition, and re-composition (Chen 2008). New methods are needed for S-D informed SCRM design, e.g., the many (firms) to many (customers) model. Network-to-network "touch points" modeling is needed to capture the process of knowledge sharing and interaction to create customer experiences. The S-D informed SCRM model calls for new technology and strategy in integrating customers' processes with the firm's business processes in a service ecosystem. What is important is that the process integration is to assist in the customer's value creation process; the focus is on value "in-use" or "in context," not the product or the firm's value proposition. New metrics for co-created value need to be devised.

6 Conclusions

Facing "formidable" social customers, companies are forced to rethink their ECRM design in general and SCRM design in particular. SCRM emerged only recently, in late 2009, and many people today are still defining what SCRM is even though some already believe that SCRM has become mainstream (Forrester 2010). Despite the fact that concepts appeared in emerging SCRM definitions (Greenberg 2010) are seemly S-D logic friendly such as customer engagement, customer experience and advocacy, some companies have continued approaching SCRM implementation with G-D logic, rendering their efforts ineffective.

This chapter contributes to examine the new social commerce open environment context for SCRM development as opposed to the traditional closed world of pre-Web 2.0 era for traditional ECRM development. We reviewed the 10 foundational premises (FPs) of S-D logic and point out the fundamental difference in the two approaches–G-D logic versus S-D logic–to ECRM design. We have shown that SCRM is at the cross-road of the two approaches and urge companies to shift their design thinking from a goods- and transaction-based, firm-centric model of exchange and marketing, in which value is created by the firm and delivered and where "relationship" means repeat patronage, to a true relational, customer-centric model in which value is created collaboratively and relationship is based on reciprocal service provision. We explained how S-D logic provides fundamental principles from which SCRM and next-generation ECRM systems can be developed. Design implications from each of the FPs of S-D logic on SCRM have been discussed.

S-D logic informed system design represents a shift in logic for ECRM design in general and SCRM design in particular. Traditionally, IS designers are trained to focus on "value propositions" of the firms instead of "value co-creation." At best, "co-production" with customers has been considered in design methodologies such as Joint Application Design (JAD) and Rapid Application Development (RAD) and, more recently, in agile methods in which customers' elusive requirements are solicited and modeled through an iterative design process that can incorporate customer feedbacks (Jaworski and Kohli 2006). The focus of these design methods is still largely coming from a G-D-logic—that is, "services" as an extension of a product or a different type of product. Product focused design treats customers as isolated entities and neglects customers' resources for collaborative value co-creation. Therefore, S-D logic informed ECRM design should closely examine social customers in their own context and their own networks, understand relationship-building in a multi-level service ecosystem and consider resource integration from various entities (customers, firms, suppliers, and their networks) for value co-creation. We caution that social technology emphasized in SCRM is simply a technology and its strategic use should be guided by the value co-creating, relational S-D logic or its use would easily fall under firm-centric, output production or transaction-based G-D logic.

A simple shift in perspectives results in a fundamental rethinking of system design and challenges the traditional ECRM or IS design methods for SCRM development. This chapter calls for future research on open, adaptive service ecosystem, e.g., Ultra Large-scale Systems, crowd-sourced, edge-dominant Metropolis Systems (Kazman and Chen 2009), in addressing the new issues posed, including, to name a few, modeling and measuring customer competency in participating in value co-creation, modeling and network analysis of many-to-many interaction in social media, customer experience design for value co-creation in service ecosystem, dynamic process modeling for value co-creation, and adaptive service-oriented design methodologies for SCRM development.

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e-Novation: A Platform for Innovation in the Digital Economy

Hugh M. Pattinson

Abstract e-Novation is innovation developed and delivered through a collaborative information platform evolving in sophistication and capability in the digital economy era. A neo-Schumpeterian perspective of innovation through an age of technological revolution focused on computerising (digitising) the global economy running from about 1971 to about 2020 to 2030 in this chapter. A platform perspective is outlined, offering insights into developments in innovative digital technology and business, institutional, economic and social development. The Wide–Wide Web is discussed as a "Platform" (Web 2.0 and Social Media), with reference to e-Marketing 2.0 based on a Service-Dominant Logic Perspective (S-D Logic). Innovation sensemaking, visualisation, mapping and operationalization into collaborative information platforms are discussed, with reference to a selection of approaches for incorporating conscious and unconscious decision-making into software applications and systems—including Decision-System Analysis (DSA), Roadmapping, Business Models, Case-Base Reasoning (CBR), and Cognitive Task Analysis (CTA). Next generation e-Novation will be characterised by development of an increasingly intelligent collaborative information platform capable of producing a fully digital innovation cycle (ideation, feasibility and digital commercialization), including new developments in "additive manufacturing", and rendering of digital economy services—including group and individual digital "selves".

Keywords e-Novation · Innovation · Digital · Platform · Collaborative · Information · Service-dominant · e-Marketing · Sensemaking · Neo-Schumpeterian · Technology · Technoeconomic · Age

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1 Introduction

During the mid-2000s, various business teaching and research experiences focused on emerging e-business technologies and e-marketing strategies and implementation, were compiled and presented in a special session at the 2007 Australian and New Zealand Academy exploring marketing and business developments using Web 2.0. Web 2.0 was not just reshaping marketing (into new forms of "e-Marketing"), but also value creation and, by logical extension, innovation. A project emerged out of the Special Session to develop a perspective of innovation combined with Web 2.0 and new generation e-Marketing—the "e-Novation Project" (Low et al. 2007; Pattinson 2010, 2011). Hugh Pattinson and David Low developed and refined the term "e-Novation" producing the book, "*e-Novation for Competitive Advantage in Collaborative Globalization*: *Technologies for Emerging e-Business Strategies*" in 2011.

This chapter grounds "e-Novation" within a Neo-Schumpterian perspective of innovation within a long-term technological revolution—wave—or "Age" of computing and telecommunications, focused on computerization (known today as "digitization") of the global economy.

A platform perspective is applied to development and deployment of key technologies within the Age, including the World-Wide Web as a platform (Web 2.0). e-Marketing 2.0 (i.e. Marketing in Web 2.0 environments) is discussed with reference to a Service Dominant Logic (S-D Logic) perspective. Innovation enactment and operationalization into software applications and systems—collaborative information platforms—is also discussed. Next generation e-Novation featuring an advancing collaborative information platform with full digital innovation capability, to render new digital economy business, institutional and social goods and services—including powerful digital representations of 'groups' and one's "self".

2 What is e-Novation?

Low and Pattinson (2011) define *e-Novation* as:

> a combination of Innovation and e-Marketing enabled by New Collaborative Platforms that are being developed and released using Web 2.0 methodologies, allowing for a different level of connectivity around the world. e-Marketing is defined as marketing within Computer-Mediated Environments focused on Web 2.0, including the Social Web component, better known as Social Media. A Service Dominant Logic (S-D Logic) marketing perspective is incorporated to highlight collaborative information-intensive value creation (Low and Pattinson 2011, 49).

Figure 1 highlights e-Novation as a combination of innovation, collaborative information platforms and e-Marketing.

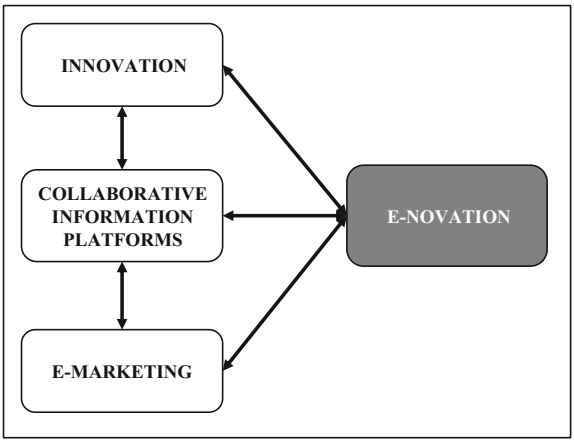

Fig. 1 E-Novation–Adapted from Low and Pattinson (2011, 9)

e-Novation has emerged as a platform for future technological, business and social innovation in the current longer term information processing techno-economic paradigm focused on digitizing the global economy.

3 e-Novation as Innovation in the Age of Computing and Telecommunications: A Neo-Schumpeterian Perspective

Schumpeter's view of innovation can be viewed as the commercial introduction of a new product or a 'new combination' that links technological, economic, institutional and organizational factors. The 'new combination may wreak creative destruction which may in turn and time unleash cycles or waves of profound and transformational regional, national and global economic development..

Followers of Schumpeter's views—the Neo-Schumpeterians–exemplified by Christopher Freeman and Carlotta Perez "analyse technical change and innovation, with their regularities and evolution, delving into the characteristics and dynamics of innovation, from individual technical changes through clusters and systems to technological revolutions" (Perez 2010, 185). Perez outlines a hierarchy for technologies and technical changes:

> The *technological trajectories* of individual products (Themselves made up of technology systems and subsystems as described by Arthur (2009)) are grouped in technology systems that are in turn grouped in technological revolutions; the system trajectories overlap generating externalities and markets for each other, thus influencing the direction of further innovation.
>
> *Technological revolutions* are clusters of interrelated technology systems that only merit the term 'revolution' because their impact extends far beyond the boundaries of the new industries they introduce. Arthur (2009) defines technologies as principles developed into

subsystems and systems. Arthur (2002, 72) also suggests that some clusters of technologies may trigger structural deepening and possibly industrial and economic revolution.

A great surge of development is the constitution of the process of diffusion of these massive changes and of their economic and social effects.

The technoeconomic paradigm is the vehicle of wide-ranging change of direction in innovation associated with the surge of development, and is a best practice model gradually emerging from practical experience in applying the new technologies (Perez 2010, 199–200).

Explosive growth based on discontinuous innovation emanating from a cluster of new dynamic products, technologies, industries and infrastructures drives development, interacting with social and organizational institutions to rejuvenate (and to destroy some) existing industries, pushing productivity and economic development at a new level—ushering in a new techno-economic paradigm. Figure 2 highlights that a full techno-economic paradigm not only has engines of growth for long-term development based on clusters of technology, but also essentially new platforms are developed to support and enhance a higher level of overall productivity for the whole productive system (Perez 2010).

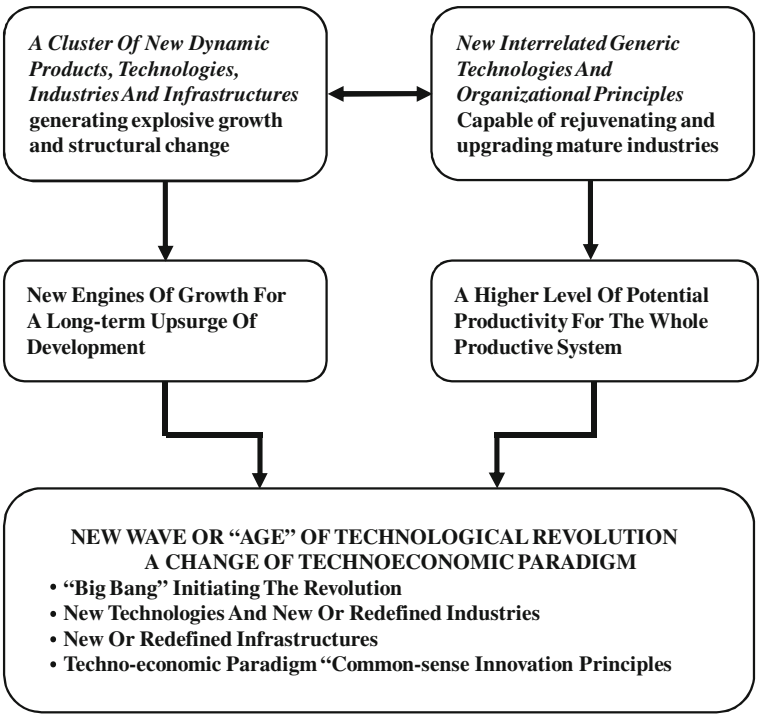

Fig. 2 Factors and Interactions Leading To A New Wave Or "Age" Of Technological Revolution,and A Change of Technoeconomic Paradigm.. (*Source* Adapted from Perez 2002, 9; Perez 2010, 190, 192, 196)

Freeman (2011, 141) illuminated key elements of a techno-economic paradigm:

1. A new 'best practice' form of organization in the firm and at the plant level
2. A new skill profile in the labour force, affecting both quality and quantity of labour and corresponding patterns of income distribution
3. A new product mix in the sense that those products that make intensive use of the low-cost key factor will be the preferred choice for investment and will represent, therefore, a growing proportion of GNP
4. New trends in both radical and incremental innovation geared to substituting more intensive use of the new key factor(s) for other relatively high cost elements
5. New trends in the location of investment both nationally and internationally as the change in the relative cost structure transform comparative advantages
6. A particular wave of infrastructural investment designed to provide appropriate externalities throughout the system and facilitate me use of the new products and processes everywhere (Antonelli 1992, cited in Freeman 2011)
7. A tendency for new innovator-entrepreneur type small firms also to enter the new rapidly expanding branches of the economy and in some cases to initiate entirely new sectors of production

Freeman and Perez identified and incorporated five long-term Kondratiev Waves (in honour of Nikolai Kondatiev, who hypothesized about longer terms cycles of economic development linked to capital allocation and investment—largely in new technology) of about 50–60 years from the Industrial Revolution into the 21st century (Freeman and Perez 1988; updated in Freeman and Louca 2002).

Perez amplified the Kondratiev Wave analysis to describe for wave clusters of new technologies and infrastructures—including a "big-bang" technology fundamental to the new technology revolution, new and redefined industries, and techno-economic "common-sense" innovation principles.

Table 1 encapsulates Perez's (2002), (2010) Five Ages of Technological Revolution (the same as Freeman and Perez's (1988) Five Kondratiev Waves),

Table 1 Five ''Ages'' of Technological Revolutions (Kondratiev waves)(*Source* Adapted from Perez 2002, 11)

1st The 'industrial revolution' (1771–1829): Water-powered mechanization of industry
2nd Age of Steam and Railways (1829–1873): Steam-powered mechanization of industry and transport
3rd Age of steel, electricity and heavy engineering (1875–1918): Electrification of industry, transport, and tile home
4th Age of oil, the automobile and miss production (1908–1977): Motorization of transport, civil economy, and war
5th Age of information and telecommunications (1971–2020–2030?): Coivqiutexizaiion (digitization) of entire economy

highlighting Clusters (constellations) of technological and organizational innovations, and techno-economic "common-sense" innovation principles. Some Waves/Ages were discrete others overlapped as they emerged in previous and declined in subsequent ages.

The Five Ages of Technological Revolution from the 1770s to about the 2020s/30s, as outlined by Perez (2010, 196–197):

- *The 1st Age—The "Industrial Revolution"* ran from 1771 to about 1829 based on water-powered mechanization of industry. Techno-economic innovation principles included: Factory production, Mechanization, Productivity/time keeping and time-saving, Fluidity of movement, and local networks close to water driving production and transport.
- *The 2nd Age of Steam and Railways* ran from about 1829 to about 1873 based on Steam-powered mechanization of industry and transport. Techno-economic innovation principles included: Economies of agglomeration/industrial cities/national markets; Power centres with national networks; Scale as progress; Standard parts/machine-made machines; Steam Energy where needed; and Interdependent movement (of machines and of means of transport)
- *The 3rd Age of Steel, Electricity and Heavy Engineering* ran from about 1875 to about 1918 based Electrification of industry, transport, and the home. Techno-economic innovation principles included: Giant structures (steel); large corporate Bureaucratic Structures, Economies of scale of plant/vertical integration; Distributed power for industry (electricity); Science as a productive force; Worldwide networks and empires (including cartels): Universal standardization; Cost accounting for control and efficiency; and Great scale for world market/'small' is successful, if local
- *The 4th Age of Oil, the Automobile and Mass Production* ran from about 1908 to around 1974 based on Motorization of transport, civil economy, and war. Techno-economic innovation principles included: Mass production/mass markets, Economies of scale (product and market volume)/horizontal integration, Standardization of products; Energy intensity (oil based); Synthetic materials; Functional specialization/hierarchical pyramids; Centralization/metropolitan centres—suburbanization; and national powers, world agreements and confrontations.

For each of the four Ages above, Freeman and Perez (1988) and Perez (2002), (2010) identified a "big bang" technological innovation, plus new and redefined industries and infrastructures. Freeman and Perez also highlighted economic crises approximating to transitions from one Age—and Techno-economic paradigm—to the next e.g. "Hard-Times" 1830s–1840s, Depression during the 1890s, the Great Depression in the 1930s, and structural adjustment during the 1970s–1980s.

During the late 1980s Freeman and Perez proposed a *New Fifth Age of Information and Telecommunications*, based on Computerization of the entire economy. 25 years ago, duration for the new Age was presented as an open-question, but as computerization actually started to drive global economic development, a cycle could be discerned of between 50 and 60 years (i.e. from 1971 to 2020–2030).

Overlapping occurs between cycles but development of the microprocessor in 1971 as a big-gang technology is a reasonable starting point. Development of the Personal Computer (the MITS Altair in 1975, the Apple 2 in 1977, and the IBM PC in 1981) was also a technological catalyst for a big surge in development for the 5th Age. So, 1977 has been noted in this discussion as the effective end of the 4th Age. "Computerization" is now updated to be "Digitization" reflecting convergence of several technologies, industries and social interaction in a state more familiar for 21st century readers.

Table 2 highlights key features of the Fifth Age of Information and Telecommunications based on digitization of the whole economy, including the "Big-Bang" Initiating the Revolution, New Technologies and New or Redefined Industries, New or Redefined Infrastructures, and Techno-economic paradigm "Common-sense innovation principles".

The Information Revolution unleashed a set of industries and branches producing several large, powerful companies in hardware, software, networking and telecommunications—and newer companies focused on Web-based applications and services. Several infrastructures converged into one Digital information infrastructure unleashing even more companies, organizations and new products and services.

Techno-economic paradigm Common-sense innovation principles for the 5th Age of Information and Telecommunications based on digitization of the whole economy add up to a new form of innovation which we describe as "e-Novation". Innovation principles include:

- *Information-Intensity*: Initial innovation in microelectronics-based ICT in turn is a catalyst for further innovation to develop digitised or software-based highly information intensive platforms, goods and services
- *Decentralized integration/network structures*: initially, large corporations and governments computerised various parts of their operations, but the advent of Personal Computers and Public networks with easy user access effectively "democratised" the revolution, promoting decentralised networks of businesses, organizations and smaller collaborative groups
- *Knowledge as capital/intangible value added*: digitised "goods" and services including information are typically assessed as intangible and as knowledge assets. Initially, businesses offering hardware equipment, telecommunications equipment and defined software applications grew rapidly with largely defined physical capital assets and tangible value, but from the early 1990s. Web-based software, "goods" and services which are essentially intangible and viewed as "Knowledge appliances and Services (see more discussion in Service-Dominant Logic section) have dominated valuation of star Fifth Age businesses—and dominated economic growth figures.
- *Heterogeneity, diversity, adaptability*: Initial computerisation of large corporations and governments appeared to be planned and controlled—indeed development of the Internet was initially a military project to address redundancy during a thermonuclear war. However, from the early 1990s onward, after of the

Table 2 5th Age of Information and Telecommunications 1971-2020-30? Constellation of technical and organizational innovations: Computerization (Digitization ofthe whole economy) (*Source* Adapted and updated from Perez 2002; 2010)

Big Bang Initiating theRevolution	New Technologies and New orRedefined Industries	New or Redefined Infrastructures	Techno-economic paradigm "Common-Senseinnovation principles
The Intel microprocessor is announced in Santa Clara,California (1971)	The Information Revolution	World Digital telecommunications(cable, fibre optics, radio andsatellite)	Information-Intensity (microelectronics-based ICT)
	Cheap microelectronics		
	Everything connected through a sliver of silicon	Converged Digital Information,Communications Media Infrastructure	Decentralized integration/ network structures
	Computers, software		Knowledge as capital/intangible value added
			Heterogeneity, diversity, adaptability
	The World-Wide Web as a softwareplatform – and a Business andSocial Platform	Internet/E-Mail, and other e-services	Segmentation of markets/ proliferation of niches (even down to a unit if one?)
	Telecommunications	Multiple source, flexible useelectricity use electricity networks –smart, sustainable, substantialrenewable energy sources	Economies of scope and specialization combinedwith scale (Digital "Law of Assets")
	Control Instruments		Globalization/interaction between the global and thelocall
	Virtual/Augmented Reality		
	Computer-aided biotechnology andnew materials		Inward and outward cooperation/ clusters
		High-Speed Physical Transport links(land (particularly Rail), air andwater)	Instant contact and action/instant globalcommunications
	Nanotechnology		Mobile - anywhere, anytime
	Digital Fabrication		Digital representation of "self" and "groups"
	Early emergence convergence of nanotechnology and biotechnology (for 6th Technological Revolution?)		

Internet was thrown open to public access and its user-friendly multimedia access service, the World-Wide was development, the Internet has developed as a classic complex adaptive system. Apart from management of protocols, standards and domain names, the Internet grew with minimal control. So too has innovation associated with the Internet, such that technologies, businesses, institutions, and societies exhibit complex adaptive features such as adaptability, agility and attempting to develop and manage at the edge of chaos (Goldman et al. 1995; Brown and Eisenhardt 1998).

- *Segmentation of markets/proliferation of niches*: initial computerisation supported information and production capability for servicing large numbers of large market segments. Switching from largely machine-based customisation to software driven customisation and service delivery enabled servicing "super-fine" market segments (down to lots of 10s to 100s even in large consumer markets)—and even right down to units of one i.e. One-To-One Marketing approaches. (Peppers and Rogers 1996).
- Economies of scope and specialization combined with scale: While physical resources and physical means to transform them into products may be scarce, software enables information to be abundant and to be harvested and reconfigured on almost infinite ways—a "Law of Digital Assets" (Rayport and Sviokla 1995).
- *Globalization/interaction between the global and the local*: Initial economic development, leadership and generation of income in the 5th Age accrued largely to innovative U.S. based hardware, software and networking companies globalizing early in the development with many literally being "born-global". Advanced and advancing digital communications enables more sophisticated multimedia interaction between global and local individual and groups.
- *Inward and outward cooperation/clusters*: Diversity, adaptability and almost seamless global/local interaction enables development of strong internal and cross/extranet cooperation and clusters.
- *Instant contact and action/instant global communications*: Although previous technology revolutions compressed communications from weeks to days, the Fifth Age supports—and almost mandates—a real real-time "right-now" approach to almost everything. Current and emerging social media applications are designed to enable and further develop immediate action and feedback.
- *Mobile–anywhere, anytime*: The rapid emergence of digital mobile telecommunications from the late 1990s to the present has transformed the meaning of individual location and bringing together people in a locality. Over 87 % of the world's population own mobile phones and over 1.5 billon people use mobile phones to access the Web (Mobile 3G) (Mobithinking 2013). Emergence of the 3G version of the iPhone and iPad, and Google's Android Operating System unleashed an explosion of innovative location-based goods and services.
- *Digital representation of self and groups*: the real world is being rendered into a digital or virtual world. Initial renderings into virtual reality are still recognisable as representative but moving onto augmented reality distinctions between real and virtual reality become blurred. Sullivan's (2011) view of

"Digital People" as people rendering digital versions of themselves online opens new opportunities and challenges of who we are and how we may interact with machines. Similarly, how we are represented digitally and how those digital rendering interact as groups open further opportunities and challenges for new goods, applications and services.

3.1 The Fifth Age of Information and Telecommunications: Three Phases of Innovation and Development

Pattinson (2012) explored development of digital technologies, marketing and business models going into and during the peak of the Fifth Age of of Information and Telecommunications—essentially the "Digital Economy Era". Table 3 outlines three phases within the Fifth Age.

In the First phase from 1971–1991—*Emergence of Information and Communications Technology (ICT)*—underlying components required for computerization are developed i.e. computer hardware, software, and networking. The exemplary network of the Age—the Internet—is developed and deployed for military and limited academic use. The Personal Computer "democratized" computing to individuals pushing the revolution into schools and the home.

The "Digital Economy Era" really begins with public user-friendly access to the Internet from about 1991—opening up the "Information Superhighway" and building National and Global Information Infrastructure—and in this analysis is divided across two phases (the *New Economy* and the *Digital Economy*).

The *New Economy* phase ran from 1991 to 2010, starting with the Internet opening up gradually to the public for commercial use, building up to an advanced digital platform that could then support digitisation of key business, institutional and social functions and activities. In the early 1990s, accessibility to the Internet was revolutionised through a multi-media server searchable service (the World-wide Web) and an effective graphic user interface in the form of Web Browsers. Initial Web development and access (effectively Web 1.0) was the development of a creation storage and sharing system—effectively a whole new software distribution infrastructure.

Digitisation essentially renders "things" into bits that are read and processed as software. Armour (2000) viewed software as a medium and means for acquisition and sharing of knowledge, so development of a powerful software distribution infrastructure which in turn is innovating over time is fundamental to the digitisation of the global economy.

The Web enabled innovation in development and use of online communications, including e-Mail and Messaging, connection of databases and business information to Web Browsers enabling emergence of e-Commerce, and Information Search Management (Search Engine Optimisation/Marketing).

The "dot.com" boom and bust from about 1995 to early 2000 is typical of a speculative investment in a great surge of development, becoming a bubble and then crashing—but after the crash productive investment builds out new industries and infrastructure at orders of magnitude greater than before the crash (Perez 2002).

After the dot.com bust, convergence and digitisation of information-based industries emerged. Broadband communications technology enabled faster transmission and viewing of dynamic multimedia Web content, which in turn evolved into a platform supporting advanced business and social activities. Digital mobile

Table 3 Fifth Age of Information and Telecommunications: From Emergence of ICT to New Economy To Digital Economy

1971–1991: "Emergence of Information and Communications Technology (ICT)
Development of mainframe and mini computers, software, data communications and networking,Internet for military and academic use.
Personal Computer "democratizes" Computing for individuals and home use
1991–2010: "New Economy"
Public/CommercialAccess to Internet
Worldwide-Web as an a software creation, storage, sharing an distribution system - and easy public interface to Internet
Web-Based Business and Social activities – emergence of E-Mail, Messaging, E-Commerce and E-Marketing, Search Engines, Web Services
Digital Mobile Communications (2G, 3G), Broadband for regions and countries Switch from Speculative to Productive investment in digitisation (dot.com boom, bust and recovery)
Development of Web as a Platform (Web 2.0) with increasing intelligence and virtual capabilities (Semantic Web, Virtual Worlds)
Emergence of Social Computing
Emergence of Social Media
2011–2020–30?: "Digital Economy""
Digital-based, driven and rendered functions for education, government, business, organization, and social
Digital rendering of "self"
High-Speed Mobile Communications driving business (4G, 5G out to about equivalent to 8G?), institutional and social developments
Location-Based Digital Business and Marketing models
Analytics of Everything; Big Data analysis, Cloud Computing, E-Research based on data-driven discovery and application to thought and action
Behavior Computing
Augmented Reality and immersion blurring creation from reality
Full Digital Manufacturing and Delivery – FAB and 3D Printing, Rendering, Additive Manufacturing and Production

telecommunications (2G and early 3G) developed to enable Web access but with services modified for the slower mobile bandwidth and smaller user interfaces for mobile devices.

Later in the New Economy phase, the Web evolved into a collaborative digital platform (Web 2.0) offering advanced business and social applications and services. Operating systems were incorporated into mobile phones—making them smartphones and smart mobile devices capable of offering innovative and novel location-based services and Web access. Apple's launch of the iPhone 3G mobile phone and Apps Store in 2008, followed by Google's launch and development of their Android Mobile operating system and apps transformed preferred Web access to mobile. Development and application of the Semantic Web through the mid-2000s enabled more "semi-intelligent" services to be offered over the Web; e.g. semantic search engine capabilities, advanced recommendation systems within Amazon and Google, and development of event-driven services and processes supported by Semantic Web capability.

Social computing emerged in the mid-1990s, describing "any type of computing application in which software serves as an intermediary or a focus for a social relation" (Schuler 1994, 2). Social Computing takes a computational approach to the study and modelling of social interactions and communications (Zeng et al. 2007).

> Significant social-computing applications in recent years have focused on Web-supported online communities, games and interactive entertainment, e-business applications, and forecasting and decision making in the public sector. Social computing is a crucial next step, following personal computing, in computing's evolution (Zeng et al. 2007, 20).

The *Digital Economy* phase recognizes the Economist Intelligence Unit's (EIU) switch from reporting on Global e-Readiness from 2000 to 2009 to Digital Economy Rankings in 2010.

> The challenges ahead for countries, in our view, will be in learning how to extract the maximum economic and other benefits from the use of digital technology. To better reflect this current stage of the journey, we have given a new name to our study: the 'digital economy rankings' (EIU 2010, 6).

The EIU recognised that development of e-government, e-learning and advanced online business and social services will be critical for a competitive digital economy. In effect, as much as possible of global economy and institutions will be digitised in the Digital Economy phase. Digital rendering will be completed as far as possible or financially practical for industries, businesses institutions and even as far as groups and individuals.

"e-novation" effectively starts with the development of a collaborative information platform in the mid-2000s during the "New Economy phase of the 5th Age of Information and Telecommunications".

4 A Platform Perspective on Innovation and Building a Collaborative Information Platform

A key principle for technological innovation is platform leadership. Gawer and Cusanamo (2002) characterise the "modern high-tech platform (as) an evolving system made of interdependent pieces that can each be innovated upon".

Gawer and Cusanamo (2002, 2–3) highlighted as platform leaders for particular information technologies including Intel (information microprocessor chips), and Cisco (networking), Microsoft (Personal Computer Operating Software) and Adobe (Portable Document Format—PDF- and desktop publishing software).

Microsoft initially gained platform leadership through its DOS, then Windows Operating System. Additional features and applications such as an Internet browser were integrated into the Windows operating environment. Further proprietary closed development of Microsoft Office word-processing, spreadsheet, and presentation applications strengthened the Windows environment as a platform. Extensive development of a wide range of software applications turned Windows into a dominant industry platform.

Adobe's Portable Document Format (PDF) was a foundation for an industry platform in desktop publishing. Adobe extended the platform into image, video and Web publishing.

Gawer and Cusmano (2008) highlight differences between product and industry platforms:

> a product is largely proprietary and under one company's control, whereas an industry platform is a foundation technology or service that is essential for a broader, interdependent ecosystem of businesses. The platform requires complementary innovations to be useful, and vice versa. An industry platform, therefore, is no longer under the full control of the originator, even though it may contain certain proprietary elements Gawer and Cusmano (2008, 28).

Hiddens et al. (2011, 29–30) identified four drivers of business strategy based on industry platform leadership including

- Modularity
- Increased interconnectivity
- Self-organization, and
- Low marginal cost of production, which makes the advent of two-sided markets more prevalent.

Cusmano reported extensively on software platform development and leadership with particular reference to Microsoft and Internet-based software, during the 2000s. Evans et al. (2006) focused on development of software platforms driving innovation and transforming industries, identifying over 15 Software platforms for PC's, Game Consoles, PDA's/Smartphones, and Digital Media.

> The design of software platforms and the business models they serve have important consequences for the structure of industries based on computing devices Evans et al. (2006, 39).

Actually, developing and maintaining "platform leadership" during a time of surges of technological development in a new Age is a daunting challenge for businesses. In the rush to develop new technologies and new platforms, businesses faced hypercompetitive conditions (D'Aveni 1994), where high-technology adoption (Moore 1995) can be sudden—in many cases emergent—almost monopolistic, but equally can suddenly decline or disappear—or become a free or minimal cost baseline requirement in a platform.

Porter viewed aspects of ICT and Internet technology as emerging to push out operational efficiencies and giving producers a short-term large return, but then dropping back to being low-cost or even free and offering buyers a benefit but not competitive advantage.

Rapid swings from a goldmine of technological dominance to being pervasive (not noticed but basically valuable) or ubiquitous (to be an essentially utility for and within the platform) tests even the most capable of technology entrepreneurs and businesses. Carr (2008) sees the Internet as moving toward a pervasive utility providing computing and web-hosted services (what we would now call cloud computing services) in the same way as power and water is offered to business and homes. Carr highlighted, Google as equivalent to a modern electricity utility company (Carr 2008, 67–69).

Brown and Eisenhardt (1998) highlighted that several technologies need to be scalable to maintain their leadership—today what might be described as their platform leadership—through probes and experimentation as a means to develop in a competitive environment characterised by complexity and chaos. For example Intel needs to develop new chips technologies that are both scalable to support technology platforms for a reasonable time period to make money—but also to be sufficiently adaptable and agile to jump or leapfrog to much higher performance levels if required. Visualizing such scalability and associated strategic thinking is often expressed through roadmapping (see later discussion on sensemaking and mapping innovation).

Friedman (2007) applied platform leadership principles to defining a new form of globalization (3.0) using a collaborative information platform. Friedman defined platforms as "the basic underlying operating systems for innovation and production" (Friedman 2007, 605).

The collaborative information platform is based on a progression of ten technology flatteners starting in the late 1980s and building toward the middle of the first decade of the 21st century. Friedman outlined a "triple convergence" that simultaneously produces a powerful collaborative information platform which enables new forms of business and social interaction and development. Table 4 highlights Friedman's (2007) ten "Flatenners" starting from about 1989 and building on each other through to the mid-2000s creating a global collaborative information platform. Figure 3 indicates the Triple Convergence emerging out Business and Social (i.e. social institutions, groups and individuals) interacting with the technologically converged global collaborative information platform.

Technological convergence produced the actual collaborative information platform. The converged technological platform then offered business

Table 4 Flatteners contributing to development of a global collaborative information platform (*Source* adapted from Friedman 2007)

1	Microsoft windows operating system (1989)
2	Netscape navigator web browser (1994–1995)
3	Workflow software (Mid-1990s)
4	Outsourcing to address Y2K challenges (mid-late 1990s)
5	Offshoring full product development/manufacturing activities (early 2000s)
6	Supply-chaining (early-mid 2000s)
7	Uploading of user-generated content (mid-2000s)
8	Insourcing activities into other organizations supply-chains and information flows (mid- 2000s)
9	In-forming through search-engine optimization and information flows through managed portals (mid-2000s)
10	Offering information through Digital Mobile, Personal, and Virtual enhancement (mid-late-2000s)

Flatteners l–10 build on each ether end converge to create a global collaborative information platform (technological convergence)

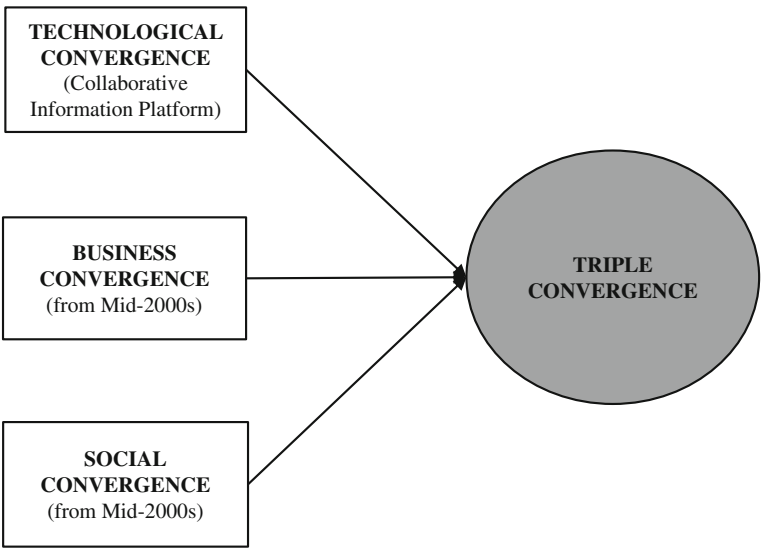

Fig. 3 Development of collaborative information platform and the triple convergence (*Source* Adapted from Friedman 2007)

opportunities to develop not just innovative products and services but also business models and small groups and individuals collaborating globally on the platform (*Business convergence*). Social convergence emerged through individuals and groups interacting with other socially through the platform—possibly even a level that may produce a new social epoch.

Table 5 Web 2.0 principles (*Source* adapted and updated from O'Reilly 2003)

Web 2.0: The Web as a Platform
Enabling *technical. Business and social learning. adoption and use based on*:
Users controlling their data
Users creating content
Collaboration and participation
Collective development and use (co-creation and production: opal-source)
Network effects–applications and services that emerge and/or improve as more users "use them" (collective intelligence)
Describing software applications and activities in terms of "services"

Friedman's platform view sets up a new collaborative information platform which he sees as contributing to a new form of globalization based on individuals and small groups collaborating across a "flat world" to produce new benefits and services. In 2007, Friedman expected that the business convergence would precede the social convergence but in practice social convergence came first as individuals and groups rapidly took to, used and developed the social web (social media) aspect of the information platform.

Friedman's commentary is effectively a history of the development of a global digital platform built during the "new economy" phase of the 5th Age of Information and Telecommunications. At about the same time platform leadership perspectives were applied directly to the development of the World-Wide Web.

4.1 Web 2.0: The Internet (Worldwide Web) as a Platform

Tim O'Reilly and Dale Dougherty coined the term "Web 2.0" in 2004 and in 2005 summarised key associated themes, strategically positioning the "Web as a Platform" and "Users controlling their own data" (O'Reilly 2005). A Web 2.0 Tag Cloud and a Meme Map were produced highlighting key competencies, technologies, and applications and action statements viewed to be significant for future development of the Web.

Table 5 draws on O'Reilly's thinking, positioning Web 2.0 as a platform enabling: *Technical Learning, Adoption and Use*, *Business Learning, Adoption and Use, and Social Learning, Adoption and Use*. Key Web 2.0 principles highlight user control, user-generation of data, focus and collaboration and use of applications to produce and improve data—and services emerging out of such collaboration.

An obvious implication of platform thinking expressed as Web 2.0 is a blurring of developers and users—or in marketing terms buyers and sellers—and the concept of exchange. Proponents of "open-source" communities and innovation including Chesbrough (2006), Von Krogh (2003), Torvalds and Diamond (2001), and Raymond (2001) highlight encouraging developers and users to take software application code (source code) and freely revise and adapt for other purposes.

Raymond's (2001) comparison of the "Cathedral" approach where developers and users build or update software code to strictly set standards, is contrasted with the "Bazaar" approach where anyone collectively contributes to development with a much lighter (but still "coordinated") position to consolidating actual development. In both cases developers and users can be interchangeable. Software is much more than basic operating systems and associated software—indeed all information is software and can be subjected to the same collective development principles (Goetz 2003).

Prahalad and Ramaswamy (2004) highlighted "co-creation" and "co-production" as vital to development and unearthing of additional creation, and these terms are often associated with both application creation, and content creation and sharing using the Web.

"Crowdsourcing" is an often-repeated term associated Web 2.0 development. Howe (2011) defines:

> Crowdsourcing is the act of taking a job traditionally performed by a designated agent (usually an employee) and outsourcing it to an undefined, generally large group of people in the form of an open call (Howe 2011).

Crowdsourcing and harnessing that collective intelligence using the Web as a platform, producing networks effects as groups conceive, debate, update, break-out, content to enhance it are key principles for innovation in such an environment. Most content development and sharing now occurs in the social web component of Web 2.0—better known as Social Media.

Kaplan and Haenlein (2010) define Social Media:

> …is a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content (Kaplan and Haenlein 2010, 61).

Kaplan and Haenlein (2010, 62) classified Social Media applications as:

- Blogs
- Collaborative Projects (including Wikis)
- Social Networking Sites (Including Facebook)
- Content Communities (including YouTube)
- Virtual Social Worlds (including Second Life)
- Virtual Game Worlds (including World of Warcraft)

Cavazza's (2012) "Social Media Landscape" analysis classifies Social Media by use:

- Publishing
- Sharing
- Playing
- Networking
- Buying
- Localization

These activities are switched through three key Social Media sites (in effect "Platforms within a Platform")—Facebook, Twitter and Google+. Since 2007, a set of specifications and application program interfaces (APIs) enable most Social Media applications to interface with Facebook, Twitter and Google + and between those three underlying applications.

OpenSocial provides seamless information—including conversations, content and services to pass seamlessly through Social Media applications giving the appearance of open-source environment. Encapsulating streams of multiple forms of online and mobile communications remains a substantial challenge.

In 2009, Google attempted to redefine email 40 years on, through presenting and managing these streams as "Waves". Although the Google Wave project was closed in early 2012, principles of managing communications in waves have been incorporated into other Google applications and technologies.

Google+ and Google Hangouts incorporate management of a wide variety of traditional, mobile and social media communication. Google Think: Insights (Google 2013) is a specialised environment focused on creativity, innovation and sharing of new ideas and technology using streams of a wide variety of communications feeds.

The Google Wave project experience reminds us that substantial areas and subsystems within the Web 2.0 environment and connecting systems are not managed using open-source principles. As mobile telecommunications moved to centre-stage for Web access, "walled garden" approaches to managing content on mobile devices which have been a feature of those environments since the advent of 2G and 3G mobile content provision in the early 2000s, appear to re-emerging in different forms.

Apple's approach to managing digital content initially using a digital networking hub strategy through connecting devices such as the iPod to personal computers and synchronizing to iTunes, focused on tight management and control of content. Apple managed and provisioned content is tightly controlled by the corporation. Apple set up a digital information management platform, extending it to smartphones (iPhones) and devices (iPads). Software applications—apps—designed for use on Web connected mobile devices, cover an amazing (some might say bewildering) range fields and activities, but meet tightly controlled specifications for submission to the online Apple Store for downloading. By November 2012, over 1 million had been submitted for download through the Apple Store (Bonnington 2012).

Google, which developed the initial Open Social standards, effectively runs a controlled environment for provisioning of apps for its Android Mobile environment and such that leadership apps available is highly contested. Tibken (2012) claims that by October 2012, over 700,000 apps were submitted to Google/Android app stores/sites—equal to Apple. Google offers more flexibility to telecommunications providers and mobile device manufacturers than Apple having less control over their environment—but the Android environment still gives Google substantial control over content and provision.

A major issue for innovation, in particular with development of apps and services for mobile communications, was the downfall of Nokia as a global mobile phone leader. It missed the rapid shift to "platformization" of smartphones and associated devices using apps effectively divided to Apple and Google environments. In February 2011, Nokia established a strategic partnership with Microsoft to revive both Nokia's smartphones and Microsoft's mobile windows operating system. By October 2012, over 120,000 apps were claimed to be available through Microsoft's app store, mainly through Nokia (Tibken 2012).

The battle between a "walled garden" approach to platform management versus an "open-source" approach plus blended versions will continue as long at the digital platform continues to develop, and Web 2.0 also continues to develop as a platform. O'Reilly revisited his original views on Web 2.0 five years later (O'Reilly and Batelle 2009). They reiterated that "Web Squared—Web$^{2"}$ as a platform highlighting the following updates and future developments (Summarised from O'Reilly and Batelle 2009, 1–10):

- Web 2.0 is all about harnessing collective intelligence
- Redefining Collective Intelligence through new and emerging forms of sensory input
- Various Data subsystems and systems cooperating to produce larger (Big) datasets
- How the Web Learns: developing explicit versus implicit meaning (including development of semantic Web)
- Web Meets World: The "Information Shadow" (of Reality) and the "Internet of Things"
- The Rise of Real-Time; The Web as a Real-Time Collective Mind

These updated principles reflect ongoing development of the platform into the 3rd phase of the 5th Age of Information and Telecommunications– the "Digital Economy". e-Novation is about innovation from many angles related to "platform":

- Features of the ongoing developing digital platform
- Applications within the digital platform
- Applications and components within key technology and provider platforms (e.g. Apple IOS, Android)
- Content and Services within and across social media sites and business/social/institutional websites, collaborating with other Groups and Individuals
- Can a business start-up emerge within a social media "platform"? (for discussion on e-Novation and Start-Ups see Sood (2011)

A key principle of Web 2.0 as a platform is a co-creation/co-production mindset—and developing new service and service to go with it—a Service-Dominant Logic (S-D Logic) Marketing perspective component of e-Novation.

5 Incorporating Service-dominant Logic Marketing (S-D Logic) Within the Digital Platform

The e-Novation Project originally focused on applying Web 2.0 principles and applications to Marketing. However, debate and exploration of a service perspective based on offering goods and consulting to support or enable businesses to consume and to create further value through use for downstream and peer-partners emerged in the early 1990s. Although not consciously realized at the time, technoeconomic principles associated with the emerging 5th age of Information and Telecommunications, were shaping marketing. In the first phase of the Fifth Age "the emergence of ICT", "computing" in marketing was applied to flowcharting Marketing Decision-Making (Hulbert et al. 1972; Woodside and Samuel 1981), market research (statistical analysis of selected market sizing and problems), and catalog/database marketing.

Service dominant logic marketing has its roots in looking at a service centric perspective within the IT industry. In the early to mid-1990s, IBM was transitioning from a hardware driven company, selling large-scale mainframe systems and supporting software applications, toward software support and consulting. IBM's shift to IBM Global Services focused on consulting for all aspects of IT environments, including change-management at firm and industry levels. IBM shifted from a product-centric to service-centric perspective.

Research in the early 1990s focused on how value might be created differently from a service-centric perspective (Haeckel 1994). At about the same time, the marketing discipline focused on a much more operational and information intensive perspective of market (market orientation Kohli and Jaworski 1990), and the information intensive marketing operation (Glazer, 1991). Marketing orientation based on value creation (Narver and Slater 1990) also crossed over with exploring value in electronic environments—"Marketspace" (Rayport and Sviokla 1994) and creation of value beside and apart from physical value chains (Virtual Value Chains—Rayport and Sviokla 1995).

Service centric and information driven value creation emerged from these perspectives. Vargo and Lusch encapsulated these and other marketing themes within their perspective of service dominant logic marketing in the mid 2000s. Vargo and Lusch re-state product-centric as:

> goods-dominant (G-D) logic, the traditional orientation, in which services are seen either as add-ons to goods (e.g., after-sale service) or a special (often inferior) class of (intangible) goods (Vargo and Lusch 2011, 2).

Under a G-D logic, marketing was focused on clearing production and offering the final good with some augmented service to the user. Although Vargo and Lusch highlighted issues and challenges with a G-D logic perspective, they discuss and define Service Dominant Logic (S-D Logic) as:

> We argue that economic activity has always been primarily about the exchange of service—one party using its knowledge and skills to do something for another party, under

> conditions of reciprocity. We call this orientation service-dominant (S-D) logic (Vargo and Lusch 2011, 1).

Vargo and Lusch see a revolution for S-D logic.

> We suggest that there is an economic (and social) revolution taking place, one that is having a profound impact on our view of economic activity. It is a revolution dealing with the manner in which we can detangilbalize, store, and transmit information, which, together with the natural progression in development of specialized knowledge and skills, is making the real nature of exchange more apparent and compelling (Vargo and Lusch 2011, 2).
>
> The advances in IT and ICT, along with increasing specialization, reveal a service logic that points toward a model of innovation in which electronic, digital information and communication are at the heart of developing new interactive and collaborative, networked approaches to value creation, such as "open innovation," "customer-initiated innovation;" and the "democratization of innovation" (e.g., von Hippel 2005). It points toward e-Novation, innovation reframed in terms of collaboration in resource integration through collaborative platforms for value creation (Vargo and Lusch 2011, 2).

In effect, Vargo and Lusch are positioning S-D Logic as a marketing, innovation and creation perspective within techno-economic principles for the 5 Age of Information and Telecommunications. They go further to indicate why IT and ICT growth allows development of S-D logic. Eight primary reasons are argued here for the expansion of service eco-systems and e-Novation (Vargo and Lusch 2011, 13–14):

1. As information technology increases, the service potential of tangible things become liquefied (e.g. digital manufacturing, start/smart parts that embed intelligence, collaborative design through virtual modeling, idea generation through virtual conference rooms, product lifecycle management (PLM) to support liquefication).
2. As information technology increases goods become embedded with microprocessors and intelligence and become improved platforms for service provision.
3. As information technology increases the ability to self-serve rises.
4. As information technology increases the ability to serve others rises.
5. As the ability to communicate increases the need to transport decreases.
6. As the ability to communicate increases the ability to know customers and suppliers rises.
7. As the ability to communicate increases, opportunities for collaboration increase.
8. As the ability to communicate increases, at lower and lower costs, coordination between firms becomes more efficient and responsive.

So what does a Service Dominant Logic (S-D Logic) marketing driven new generation information intensive organization/entity look like?

Building on Glazer's view of a learning organization with information distributed through it, and marketing being essentially based on a set of information flows (Blattberg et al. 1994), Hoffmann and Novak (1996, 2009) explored marketing in computer-mediated environments (CME's), focusing on the Worldwide Web as an exemplar CME. "e-Marketing" was defining marketing within CMEs—usually meaning the Internet and more precisely the Internet. Pattinson (2011) highlighted e-Marketing 2.0 as e-Marketing based on Web 2.0 principles and applications and vital to e-Novation.

Rayport and Sviokla (1994, 1995) highlight value that could be identified from activities within electronic environments (Marketspace) and virtual value created associated with—and separated from physical value chains (Virtual Value Chains). An S-D logic perspective encapsulates ongoing developments in digital technology and in value creation within and coming out of the platform.

S-D logic focuses on one party using its knowledge and skills to do something for another party, usually through an enabling vehicle or system which Vargo and Lusch (2004, 2011) refers to as an appliance. Contemporary examples of appliances in this context include Apple's iPhone or Amazon's Kindle readers.

The Apple iPhone under a G-D logic perspective can be viewed as a device that the customer buys from Apple and perhaps adds a voice/data plan from a phone company. A S-D logic positions the iPhone as an appliance with a set of capabilities that when the user accesses it, they can create value themselves and with others. The iPhone is then seen as part of service ecosystem that includes Apple including iTunes, its Apps, Apps developers, the telephones, the user and who they create and share content or whatever they create.

For Amazon, the Kindle represents an appliance that the user may use to read content—but it is also part of a service ecosystem enabling the user to publish their own and other created books and materials—a publishing ecosystem. These two examples highlight how much extra value could be explored using an S-D perspective.

S-D logic offers a lens to explore development of value and points toward identifying possible S-D ecosystems and platforms within a platform and stretches from marketing into innovation and business strategy. Pattinson and Sood (2010) devised a framework for developing and expressing new competitive Business Services grounded in S-D logic and operationalized through Service-Oriented Architecture (SOA, for more discussion on SOA see Hurwitz et al. 2007).

> Business Services are clearly described in terms of what they do when users actually use them. Resources and systems required to support the Business Services are also identified. Scenarios are developed for both Business Services, and supporting resources and systems. (Summarized from Pattinson and Sood 2010).

Pattinson and Sood's scenario planning for marketing action (SPMA) approach recognizes that Business Services change over time—and so does the supporting platform and resources—both these streams of change need to be explored—and then perhaps Business Services can be developed to go to market much faster than the competition. These Business Services may build into or out of the digital platform. Marketers are exhorted to develop scenario—to imagine, invent and express the future—and bring goods or services to market faster.

"Collaboration" within S-D logic is expressed through co-creation, co-production, collective intelligence, and outsourcing to name a few terms. The basic notion of marketing as a set of exchanges between "buyers" and "sellers" becomes blurred—requiring new business models and strategies to understand how such value is created.

Pattinson identifies several key issues for e-Marketing 2.0 within e-Novation. Additional themes were discussed in Pattinson and Low (2011a) and Pattinson (2011), including:

- e-Novation Triple Convergence (Before and After)
- Web 3.0/4.0—The Web Is A Brain
- Redefined Collaborative Communication
- Virtual/Augmented Reality
- Service-dominant logic (SDL) Marketing and Innovation
- Open-Source Creation, Development and Distribution
- Digital Branding
- CRM Redefined (Social CRM, Web Analytics)
- Social Graphing e-Novation
- Sustainability—Platforms and Innovation
- Social Media:
  - Marketing Conversations
  - Social Media Marketing
  - Redefined Marketing Teams
  - Faster Ideation To Delivery Time (Faster Innovation Cycle)
  - Tracking Social Media Information Management

These themes highlight how digitisation of the global economy is shaping marketing—and will continue to do so profoundly during digital economy phase of the 5th Age of Information and Telecommunications.

The SPMA approach highlights cognitive analysis focused on service description incorporating S-D Logic, expressed through narratives and visualization. e-Novation is about making sense of platform-based innovation—including visualizing, mapping and operationalization into the digital collaborative information platform.

6 e-Novation Sensemaking: Sensemaking, Visualisation, Mapping and Operationalization of Innovation into Collaborative Information Platforms

A cognitive view of innovation seeks to "sense-make" thoughts and ideas into some form of conceptualization and then enactment to actual delivery of a good or service. Weick's (1995) perspective of sensemaking attempts to capture decision-making thoughts into usable stories and visualizations that can be produced into "outputs".

Pattinson and Woodside (2007) applied Weick's sensemaking principles with mapping perspectives from Huff (1990) to research, development and delivery of internet-based software Narrative storylines addressing ideation, and development of software to "proof-of-concept" (conceptualization) and release plus ongoing

updates, were visualised through decision system analysis maps, event history maps, and cognitive maps. Mapping and visualization was based on cognitive mapping. Such sensemaking—although with more commercialised principles and methods—has been applied in platform leadership analysis and planning, particularly for digital technologies.

6.1 Sensemaking Through Roadmapping and Business Models

An increasingly popular commercial approach is "Roadmapping" where visualizations are created highlighting key strategic inputs, transformations, outputs, relationships, and resources over a time period. Whalen (2007) notes that

> If the definition of a roadmap is generalized to being a visualization of strategy or strategy elements, then the use of roadmaps can be extended to support any decision process. Roadmaps should not be viewed just as the outputs of a process, but rather as snapshots of a "rolling" strategy at any moment in time (Whalen 2007, 40).

Different types of roadmaps may be created. Whalen (2007) outlines a strategic enterprise planning roadmapping approach, although typically roadmapping refers to technology roadmaps (Dissel et al. 2009; Moehrle et al. 2013).

Schuh et al. (2013) highlight Future-Oriented (technology) Roadmapping as a means to explore developments in the face of increasing uncertainty and complexity. The Internet (and its associated services) is a large-scale complex system (Park 2005). Indeed emergence of several key technologies and technoeconomic paradigms within the 5th Age of Information and Telecommunications fit patterns and descriptions of large-scale complex adaptive systems. Development of the Worldwide Web, and Web 2.0 including Social Media applications and content created within the platform can also be evaluated as in a large-scale complex adaptive system.

Scenarios expressed in stories or visualizations such as roadmaps may at least give innovators a framework to develop conversations, stories and a framework for developing strategic "outputs". Geschka and Hanenwald (2013) highlight scenario-based technology roadmapping as effective for *concrete planning of technologies and innovations*. Pattinson and Sood (2010) use scenario-based Roadmapping to visualize scenarios developing business services and supporting resources and technologies.

Figure 4 highlights key elements of "Roadmapping" including "owners" of relevant information and decision-making, inputs, forms of roadmap description and emphasis on expression over time (past, short-term, medium-term, and long-term). Outputs from the general roadmapping approach include additional specialised roadmaps (including visual technology roadmaps), scenarios, business models and business plans—and inputs to collaborative information platforms.

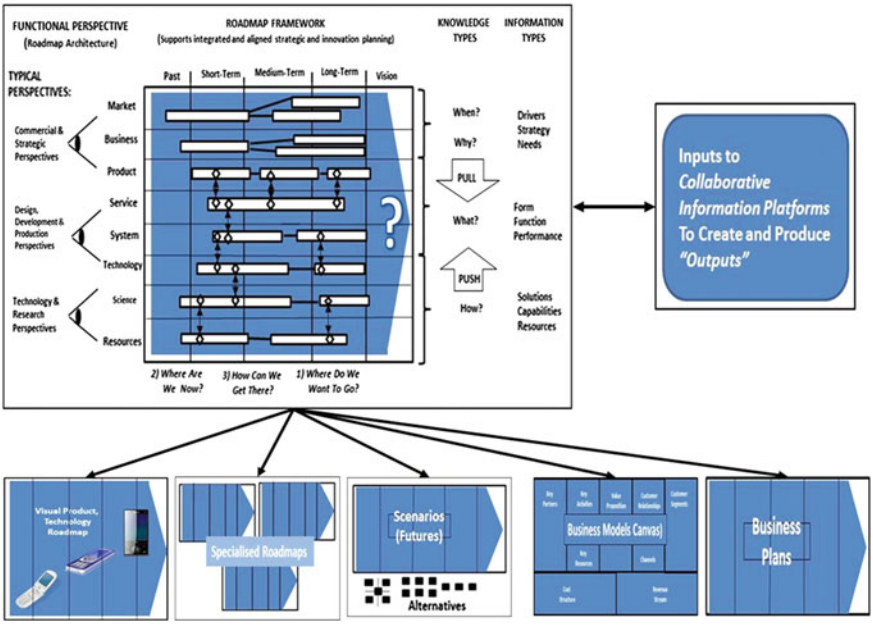

Fig. 4 Generalised technology roadmap structure (including associated outputs). (*Source* Adapted from Phaal et al. 2013, 20)

Companies such an IBM, Intel, Microsoft, and various mobile phone providers and software application developers use roadmapping to express innovation inputs, transformations, relationships, resources and "outputs" internally and to relevant stakeholders.

An additional form of sensemaking for innovation emerging over the last twenty years is describing and visualizing business models around innovation and strategy. The concept of a "business model" gain notoriety during dot.com boom of the mid-late 1990s. Teece (2010) has developed over the last fifteen years a definition:

> A business model describes the design or architecture of the value creation, delivery and capture mechanisms employed. The essence of a business model is that it crystallizes customer needs and ability to pay, defines the manner by which the business enterprise responds to and delivers value to customers, entices customers to pay for value, and converts those payments to profit through the proper design and operation of the various elements of the value chain (Teece 2010, 191).

Business models based on developing innovative digital-based goods and services around an architectural perspective aligns reasonably with *a business model as a platform at a firm level*. Recent business model research and commercial application has highlighted visualization of innovative business models. Osterwalder and Pigneur (2010) presented "The Business Model Canvas" incorporating

boxes, icons and descriptions into nine building blocks including (Osterwalder and Pigneur 2010, 16–17):

- Key partners
- Key activities
- Key resources
- Value Proposition
- Customer relationships
- Channels
- Customer segments
- Cost structure, and
- Revenue stream

6.2 Sensemaking Through Mapping Digital Platform Networks

Digital platforms can be viewed as sets of networks. Apart from the obvious basic technology networks inherent in the Internet using Internet Protocol, several network representations may be useful in understanding innovation in and associated with a digital platform. Pattinson and Sood (2010) focused on changing network representations of B2B Sales and marketing and innovation activities in the face of emerging Social Media applications. These representations highlighted mapping of online conversations and actors within those conversations—pointing toward possible multi-layered networks to be identified, mapped and analysed including:

- Networks of conversation content
- Networks of networks of online conversation applications and environments (including social graphing)
- Networks of conversers (actors)

Each of these networks can be tracked and mapped. Conversions (at least where they are reasonably public) can be tracked and mapped in terms of timing and content. Location of the actual website, social media site or application (e.g. blogs) can be captured through social graphing and mapped to other related sites or applications. Conversers (or actors) can also be reasonably identified and mapped.

Expression, mapping and operationalization of "enacted" innovation into digitised form is attempted through a plethora of information management, modelling and operations software applications, systems and even platforms.

Social Computing has evolved over the last fifteen years to be based around *Interaction*. Vrasidas and Veletsianos (2010) developed a theoretical foundation for social computing based on*: individual versus social constructivism*, *situated and distributed cognition,* and *local and non-local communities of practice*–interelating between *Interaction, Meaning, and Enculturation*. Vrasidas and Veletsianos offered examples of environments, applications, including e-learning environments and virtual communities—which could be viewed as including aspects, content, and expressions of enacted innovation.

Operationalising expressions of decision-making into rules-based hardware and software systems has been a defining feature of the 5th Age of Computing and Telecommunications. Routinization and embedding of maps and plans into rules-based software that can design and produce physical goods or information content has been available since the mid-1980s. Advancing such routinization, embedding and pervasiveness and ubiquity requires substantial development of social computing including incorporation of cognitive science principles into applications=, environments and digital platforms.

Schank drew on substantial experience with applying cognitive science principles to artificial intelligence (Schank et al. 2010), presenting a case-based reasoning (CBR) approach to developing software systems based on (Summarised from: Schank et al. 2010, 4–8):

- Decision making is largely an unconscious activity
- We make good decisions based on accumulated experience
- Decisions should flow from goal conflict adjudication, not through half-baked logic
- Expectation failure catalyzes learning that translates into better
- Decisions

Case-Based Reasoning can be found at the base of many contemporary collaborative information systems and platforms.

A more real-time focused expression of cognitive science principles is Cognitive Task Analysis (CTA). Chipman et al. (2000, 3), state that:

> Cognitive task analysis is the extension of traditional analysis to techniques to yield information the knowledge, thought processes, and goal structures that underlie observable performance.

Klein (2000) used CTA to build cognitive models to capture how real-time high-pressure decision-making is executed (e.g. naval pilots in flight and combat conditions)—much of which is pre-learned, processed and executed almost unconsciously. Klein has developed research and consulting incorporating CTA into real-time decision-making and support software applications and systems.

The advancing Web 2.0 platform is incorporating these cognitive approaches thus taking on simple aspects of intelligence. After pioneering development of the World-Wide Web, Berners focused on incorporating semantic capability into the Web, enabling event and process management of many business and social processes and activities (Berners-Lee et al. 2001; Shadbolt et al. 2006). Amazon and Google use semantic capabilities to return real-time advanced recommendations. Incorporation of CBR and CTA logic with semantic capability will enable advancing collaborative information platforms

7 Next Generation e-Novation: Advancing Collaborative Information Platforms

Moving into the Digital Economy phase of the 5th Age of Information and Telecommunications, a higher order of development, application and deployments social and behavioural based applications, environments and systems is required.

e-Novation will produce new goods and services out of—and within—an advancing digital platform with increasing knowledge and intelligence capability, supported by combinations of social computing and cognitive science, into *Behavioral Computing.*

Cao and Yu (2012) define *Behavioral Computing* as

> Behavior computing, or behavior informatics, consists of methodologies, techniques and practical tools for representing, modeling, analyzing, understanding and utilizing human, organismal, organizational, societal, artificial and virtual behaviors, behavioral interactions and relationships, behavioral networks, behavioral patterns, behavioral impacts, the formation and decomposition of behavior-oriented groups and collective intelligence, and the emergence of behavioral intelligence. Behavior computing contributes to the in-depth understanding, discovery, applications and management of behavior intelligence (Cao and Yu 2012, vi)

In effect, Behavioral Computing offers a foundation for the development of advanced collaborative information platforms capable of developing and deploying sophisticated digital innovation and digital economy activities.

Furthermore, Behavior computing may herald a possible technoeconomic paradigm principle of "e-Research", development and "Output" based on data-driven discovery and application challenging traditional theory development, knowledge creation and sharing may evolve out developments in behaviour computing. Big Data Analysis based on Behavior Computing will prompt rethinking of marketing and innovation information management. Whole worlds within the Web can literally be copied with all digitised aspects of those worlds possibly analysed through Big Data applications (e.g. Hadoop see King 2011). Identification, prioritization of key patterns, processes, links and resources combined with Roadmapping, Business Modelling can then be incorporated into advancing collaborative information platforms.

Rapid developments in advanced collaborative information platforms prompt us revisit status of current and future platform-based innovation. From a digital platform perspective, the key components on an Innovation Cycle—ideation, feasibility and commercialization are executed through a mix of "Off" and "On" Platform activities—see Fig. 5. Conception, development and "Fabrication" of goods is a mix on and off platform activities with the actual physical output typically being non-digital. Information-based or digitised goods and services can be largely conceived, developed, delivered and marketed on a digital platform i.e. "e-novated".

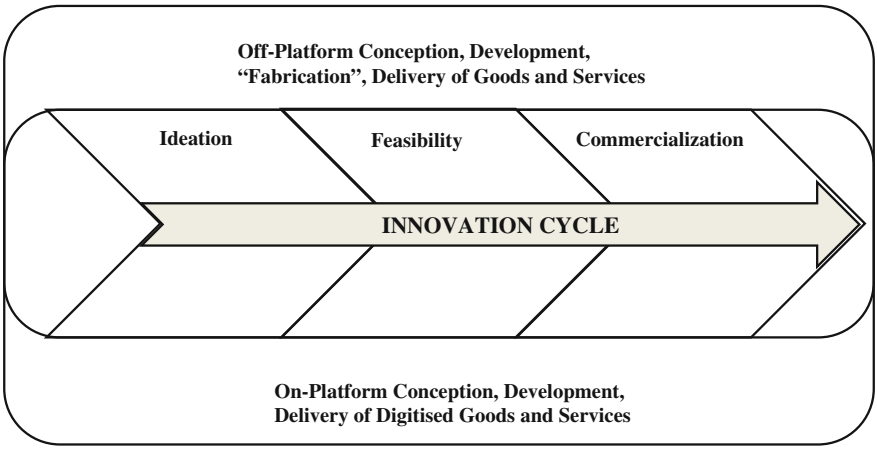

Fig. 5 The innovation cycle: "on and off-platform" activities and interactions

The next generation of digital information platforms i.e. of e-Novation may well be completely digital. 3-D Printing technology addresses the expression of digital content into output. In January 2005, Neil Gerschenfeld declared at the Library of Congress in Washington that:

> Before long, he explained, people will own inexpensive desktop machines that can print objects in three dimensions just as effortlessly as desktop computers can already print pictures and words in two dimensions. Such "personal fabricators" would, he explained, make people capable of conjuring up precisely what they want (The Economist 2005).

The concept of 3-D printing where printed images could then be rendered into parts or artefacts is not new and has been used to for crafting of specialised parts for military parts for over 15 years. However, the price of 3-D printing has fallen such that widespread adoption of the technology is now underway, with new applications and perspectives. 3D Printing is now "a form additive manufacturing technology where a three dimensional object is created by laying down successive layers of material" Roebuck (2011, 1).

Additive manufacturing (the technical name for 3D printing) may include 3-D printing of jet engines (The Economist 2012). Gerschenfeld widens his definition of personal fabrication as *Fab* will

> inspire more people to start creating their own technological futures. Personal fabrication will bring the programmability to the physical world we inhabit. While armies of entrepreneurs, engineers, and pundits search for the next killer computer application, the biggest thing of all coming in computing lies quite literally out of the box, in making the box (Gerschenfeld 2005, 24).

Lipson and Kurman (2013, 11), highlight that:

> 3D printers make things by following instructions from a computer and stacking raw material into layers. 3D's printing's unique manufacturing technique enables us to make

> objects in shapes never before possible. Adding additive manufacturing to the digital information platform enables a sufficiently digital environment to include fabrication and delivery of physical goods and services—and offering a huge range of new opportunities for development of new businesses and possibly new or enhanced industries.

Lipson and Kurman (2013, 1–5) highlight a "day-in-the-life-of" scenario about one or two decades into the future where food, news, health, business, manufacturing, education, and even creating a personal toothbrush in real-time is personalised digitally through "Fabbers".

But they dare to dream even further, through discussion with Gerschenfeld (Lipson and Kurman 2013, 275–278), that chips or circuits while larger than atoms could still be sufficiently small to be building blocks for digitised physical objects ("Voxels"). "Voxels" are likely to develop to complete the digitisation (or near-digitisation) of as much as is reasonably possible within the global economy. By about 2020, a substantial next generation fully digitalised e-novation capability will be in place.

The Word-Wide Web (and/or its successor technologies) is also expected to develop in a global operating system or "brain" (Kelly 2007). Spivack (2010) viewed the Web as evolving to a global brain:

1. The Web—Connects Information
2. Web 2.0—Social Software Connects People
3. Web 3.0—Semantic Web Connects Knowledge
4. Web 4.0—The Meta Web Connects Intelligence

As Tim Berners-Lee developed the Worldwide Web, he envisioned a global information environment where information stored on computers everywhere would be linked and available to everyone—machines would interact with people and machines. He also envisioned advances that may set the Web up as a possible global brain (Berners-Lee and Fischetti 1999).

Will next generation e-Novation through a fully digital innovation platform incorporating a global brain complete the 5th Age of Information and Telecommunications sometime around 2020–2030? Following through on this logic some of the early clusters of technologies that could herald the 6th Age of Technological Revolution are already here.

Will convergence of information technology, nanotechnology and biotechnology produce the surge toward that new age—more towards Kurzweil's (2006) vision of "singularity"?

Or do we need to think more about what "isation" of the global economy would entail to be seen as a 6th Age real technological revolution with new and changed techno-economic paradigm innovation principles?

Speculation has been toward "humanization" or "Biohumanization" of the global economy, but as such development may be emergent perhaps the technologies and the appropriate descriptive language have not yet been established. However, we can expect such development to become visible from as early as 2015 and to intensify through 2020–2030.

8 Conclusions and Closing Comments

The study grounds e-Novation within a Neo-Schumpeterian perspective of long-term technology cycles (or "Ages") revolutionising global economic development. e-Novation fits specifically within the 3rd "Digital Economy" Phase (2011 to about 2020–2030) of the 5th Age of Information and Telecommunications (focused on digitisation of the global economy, from about 1971 to about 2020 to 2030), as a means to innovate using collaborative information platforms and service dominant logic (S-D Logic).

Platform leadership perspectives were applied to emerging collaborative information platforms, and in particular to the Worldwide Web—of which Web 2.0 is essentially viewing the Web as a platform.

Sensemaking of Innovation was discussed as expression of innovative decision-making and activities as visualizations (maps) including roadmaps and business models, and then operationalized into collaborative information platforms. Aspects of Social Computing and Cognitive Science (including Case Base Reasoning and Cognitive Task Analysis) were discussed as inputs for developing increasingly intelligent collaborative information platforms—advancing e-Novation.

Discussion on next generation e-Novation highlighted a new level for combination of Social Computing and Cognitive Science through the emergence of Behavioural Computing–pointing toward new perspectives and discovery of patterns and development of knowledge out of big data cloud-based sets of information equivalent to larger systems such as whole markets or whole flows of specific information sets.

Incorporation of Behavioural Computing aspects with advancing semantic abilities, plus new additive manufacturing capabilities, point toward a digital platform capable of producing full innovation cycle activities (ideation, feasibility, commercialization and actual delivery of all good and services). e-Novation will produce innovative Digital Goods, Services—and representations of "Groups" and "Self" through the Digital Economy phase from 2011 to 2020–2030. While substantial potential remains to build out the digitisation of the global economy during this period, seeds for technologies vital for the emergence of the 6th Age of Technological Revolution will also emerge out of or beside the this platform.

Who or how will you be represented as the Digital Economy is rendered over the next 10–20 years?

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The Pervasive Influence of Electronic Word of Mouth (eWOM) on Today's Social Consumer

Francisco Rejón-Guardia and Francisco J. Martínez-López

Abstract Social networking sites (SNSs) are a booming worldwide phenomenon with enormous business potential for companies to communicate with their target-audience consumers and spread their brand-related messages. One of the notable distinguishing characteristics of SNSs, when compared to previous Web 1.0-based communication tools, is the active role that consumers play in the communication process with companies and, even more importantly, with other consumers. SNSs provide a setting where commentaries, analyses and recommendations about brands, products and services are communicated. EWOM is a unique and powerful consequence of SNSs. In this chapter, we perform a conceptual analysis of eWOM, of the motivations for engaging in it and of its effects on consumers' behavior, paying special attention to the type of eWOM that takes place in SNSs. Finally, some relevant managerial implications and research opportunities are discussed.

Keywords WOM · eWOM · Motivations · Effects in consumers' behavior · Social networks

1 Introduction

As expected, academic investigation has begun to analyze the revolution caused by online social media, as well as the increasing participation of the consumer in the behavior known as "eWOM" (electronic word of mouth). However, before

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drawing conclusions about both concepts, we ought to point out that the scope of the studies published on the impact of eWOM has been large but fragmented. Thus it proves difficult to draw meaningful conclusions from the studies analyzed. We furthermore add that the investigators have adopted diverse focuses of investigation in order to identify the phenomenon of eWOM. Because of this, few efforts have been made to integrate the contributions of earlier studies (Cheung and Thadani 2010).

It is noteworthy that those who believe in eWOM's capacity to influence the attitudes and behavior of consumers highlight the synergy and virtues that SNSs (Social network sites) have in promoting dialogue and interaction with clients. They allow the establishment of online communication with a focus on relational marketing (Andersen 2005). On the other hand, critics of eWOM communications express serious doubts about the efficacy and positivity of the consumers' behavior; this claim is related to the anonymity that communicators have in some online platforms (Guadagno and Cialdini 2005).

According to Cheung and Thadani (2010), the studies about the impact of eWOM communications should be classified into two research types: *market-level* and *individual-level* (Lee and Lee 2009). In the market-level analysis, the investigations have been focused on the study of market parameters (e.g., sales volume), observing the influence that eWOM communicators have on the sales of products (Dellarocas et al. 2007; Zhu and Zhang 2010). On the other hand, in the individual-level analysis, the investigators focus on eWOM as a process of personal influence, where the power of influence between a communicator (speaker) and a receiver can impact the consumer's purchasing decisions (Park and Kim 2008).

The influence and effects produced by eWOM are, fundamentally, consequences of the conversations between users where there are no commercial interests (Lee et al. 2009; Lee and Youn 2009). Therefore, eWOM represents a relevant activity for e-commerce, now that consumers offer and solicit opinions online just as they do offline. This specific behavior has influence over consumers' decisions and, consequently, over companies' sales. Specifically, the importance of eWOM communication resides in its capacity to produce a credible and influential flow of ideas in the process of the consumers' information search (Doh and Hwang 2009). This distinctive feature makes its study and comprehension necessary.

The main aim of this work is to offer a description of the theoretical framework of the subject of eWOM that allows the evaluation of the main precursors and motivations for eWOM, focusing primarily on the context of SNSs. Additionally, we introduce the main aspects considered to evaluate the propensity for performing and participating in eWOM and the most significant effects of eWOM on consumers.

The remainder of the article is as follows: A description of the concept is given, highlighting the principal variable precursors and components of eWOM through an analysis of literature. EWOM's influence is stressed, focusing on its effects on consumers and their behavior. To conclude, implications for management and lines of investigation are presented.

2 Background

2.1 eWOM: the Evolution of WOM

WOM (word of mouth) is not a new concept, but rather one that has been equally important in the field of marketing as in the field of communication in recent decades (De Matos and Rossi 2008). When we refer to the term "WOM," we are speaking about a strong behavior of information exchange between consumers, which has influence on diverse issues such as: attitudes and consumption behaviors (Brown and Reingen 1987a; Gilly et al. 1998), brand awareness, product knowledge and perceived value (Xingyuan et al. 2010).

Thanks to the advancement of new technologies and to the evolution of means of communication, WOM is taking place in online settings, while retaining its character and its effects. As a result, there has been growing attention paid to this subject in recent years (Dwyer 2007). The names employed on the Internet to refer to WOM have evolved; initially there were numerous terms such as: *Web-of-Mouse, Word of Mouse, Internet Word of Mouth* and *Consumer Reviews* (Shin 2008). This communication process is defined as "any positive or negative statement made by potential, actual, or former customers about a product or company, which is made available to a multitude of people and institutions via the Internet" (Hennig-Thurau et al. 2004, p.39). The word of mouth marketing association (WOMMA) has categorized WOM into two types: one which is organic, voluntary and directly produced by satisfied consumers and a second which is amplified and promoted through marketing campaigns to increase the WOM within communities (WOMMA 2012).

The main differences between WOM and eWOM lie in the fact that the former often occurs through person-to-person conversations (C2C), while in the latter, a large number of consumers (C2C) but also businesses (C2B) are simultaneously available to converse at the same level, making this format particularly attractive to businesses (Hennig-Thurau et al. 2004). Among its benefits, eWOM communications possess unprecedented scale and speed of dissemination (Cheung and Thadani 2012). It is not necessary that eWOM information be exchanged when all parties are present. Given that information presented on the Internet is stored and available for an indefinite period of time, eWOM is an enduring and accessible type of information (Sen 2008). Furthermore, eWOM communications are easy to measure when compared with WOM, since the format of presentation, amount and duration of eWOM communications make them observable. This allows investigators to analyze messages by their number of words, valence, composition, position in the website, style, etc. (Lee et al. 2008). Another of the major differences is that WOM communication usually comes from a transmitter whom the receiver knows or has information about, so that the credibility of both transmitter and message is better assessed by the receiver (Cheung and Thadani 2012).

The analysis of the literature reveals that in online contexts the possible traditional limitations of WOM are overcome thanks to advances in the technology

used to transmit the information. The consumers have access to myriad tools that allow them to share their experiences about products/services.

EWOM can be captured in a distinct form on the Internet through platforms of opinion, discussion forums, news groups, viral e-mails (Hennig-Thurau et al. 2004; Phelps et al. 2004), e-mail chats, user groups, bulletin boards, etc. (Goldsmith and Horowitz 2006). Also, in unique platforms from the Web 2.0 like: personal and corporate blogs (Hung and Li 2010); general social networks such as Facebook (Leivadiotou and Markopoulos 2010); networks that specialize in travel or tourism (Sun et al. 2006), in subjects such as music (Sharma and Pandey 2011), etc.; or in microblogging social networks, among others (Jansen et al. 2009; Zhang et al. 2011). Henceforth, we focus, because of its grand importance, on the study of the phenomenon of eWOM in social networks.

2.2 eWOM in Social Networks

Internet-based or online social networks (hereafter SNSs) are an effective channel of great potential in which consumers are able to create a visible personal profile, construct a network of personal and impersonal contacts as well as publicly share their comments (Boyd and Ellison 2007). The potential impact of virtual communities is huge, given that one can make recommendations, practically cost-free, that travel rapidly both inside and outside of the community. In addition, members of virtual communities share their interests, which can produce an affinity, proliferating the creation of links. These unique qualities of the SNSs, along with the perception of credibility of the consumer's evaluations, make the SNs into powerful platforms for the exploitation of consumers' recommendations; for instance, using consumer-to-consumer channels as a means to multiply the popularity of a brand, product or business or by means of viral marketing campaigns (Smith et al. 2007). For these reasons, businesses have begun incorporating social media as an integral part of their political marketing, especially in the marketing communication/promotion mix.

The literature indicates that SNSs are platforms where eWOM is unmistakably produced, in all of its forms; online brand communities stand out as a noteworthy example (Lee et al. 2012). Consequently, understanding the impact of eWOM on the beliefs, attitudes, motivations, and behaviors of consumers is continually more important. Focusing on the main actions of consumers in social networks, socialization with friends (preexisting) and the creation of new friends stand out, as does the exchange of information about brand-related experiences (Chu and Kim 2011). These socializing activities cause the information that is exchanged to be perceived as more credible and reliable than information that is offered by advertisers or unknown sources who may have a personal interest in the communication (Chu and Kim 2011; Lee et al. 2012).

EWOM is produced, therefore, when consumers search for (or provide) impartial and informal information in relation to products and services within a

social network. SNSs make it possible that, at the same time, multiple consumers can give their opinion related to consumption, through participation in eWOM. In this context, a voluntary exposition of information about brands, products and services is produced, in which the establishment of communications with businesses or with other consumers is revealed. This allows the creation and development of contact networks, in which the contacts of the SNs conform to a network of influence, perceived as trustworthy and credible. In this manner, SNSs are an important source of information on products or services that facilitate and accelerate the development and effects of eWOM (Chu and Kim 2011).

In summary, the growth of SNSs in recent years coupled with the importance of eWOM for advertisers and consumers in social networks make the topic of SNSs very interesting. This fact can be observed, for instance, in the proliferation of academic and professional studies regarding the subject (e.g., Cheng and Zhou 2010; Chu and Kim 2011; Doh and Hwang 2009; Hsieh et al. 2012; Hung and Li 2010; Lee and Youn 2009; Park and Lee 2009). Next, the variables that permit prediction of the participation and composition of eWOM in SNSs are reviewed, just like the antecedents of the behavior of eWOM. With this aim, a conceptual framework is presented which shows the influences of eWOM on the beliefs, attitudes and involved behaviors in eWOM with respect to products and brands in SNSs.

3 Why do Consumers get Involved in eWOM?

3.1 Previous view on WOM versus eWOM

It proves fundamental to understand that the studies focusing on the analysis of consumers' motivations engaging in eWOM differ from the generic contributions to WOM research. In this way, the analysis of the literature illustrates diverse forces focused on consumers' participation in WOM (Blackwell et al. 2005; Dichter 1966). It is logical, therefore, that studies arise that are interested in the analysis of the consumers' motivations for participation en eWOM (Chu and Kim 2011; Roy 2011; Hennig-Thurau et al. 2004).

De Matos and Rossi (2008) performed an interesting meta-analysis of the main variables that contribute to or moderate the realization of WOM. They concluded that the variable "commitment" produces a greater correlation with WOM, followed by other variables such as perceived value, quality, satisfaction and loyalty. Satisfaction will contribute to the execution of WOM in step with its ability to meet expectations. In the case of satisfaction being positive, the valence WOM is positive. On the contrary, if a consumer is dissatisfied due to a failure to meet expectations, WOM will emerge as a platform for "venting" the consumer's negative emotions anger, frustration, anxiety, and vengeance, among others. Certain studies indicate that clients on either extreme of the satisfaction spectrum

(high vs. low) are more likely to propagate WOM. In this way, WOM with a negative valence tends to be produced by consumers who rank lower on the satisfaction spectrum. Positive WOM is produced by a direct effect related to satisfaction (more satisfaction, more positive WOM), compared with negative WOM, which is produced by an inverse effect (less satisfaction produces a larger negative WOM).

The authors Hennig-Thurau et al. (2004) executed an extended study on eWOM and users' motives for participating, on online opinion pages, in eWOM. To do this, they improved the classification of motivations proposed by Balasubramanian and Mahajan (2001), which were originally organized into 3 groups of reasons for participating in eWOM, categorized by: focus-related utility, consumption utility and approval utility. These groups were expanded, putting forth eight motivations that largely mirror the reasons for initiating traditional word-of-mouth conversations: (1) venting negative feelings, (2) concern for other consumers, (3) extraversion/positive self-enhancement, (4) advice seeking, (5) social benefits, (6) economic incentives, (7) platform assistance, and (8) helping the company. Of these categories, the desire for social benefits, economic incentives, concern for other consumers, and extraversion/positive self-enhancement were the main motivations for participating in eWOM. Moreover, Hennig-Thurau et al. (2004) developed a further segmentation of eWOM users, distinguishing between consumers motivated by economic incentives, those who act without regard for others' opinions, the true altruists motivated to help consumers as much as businesses and, finally, consumers who participate in eWOM for diverse reasons.

From the subsequent efforts aimed at improving the understanding of why individuals participate in eWOM one worth noting is Goldsmith and Horowitz's (2006) study, in which they list eight reasons why Internet users search for others' opinions: (1) desire to reduce risk, (2) be influenced by others, (3) price consciousness, (4) ease of use, (5) chance, (6) desire to participate in a "cool" activity, (7) acquisition of information to supplement offline comments prior to purchase, (8) television referral. The authors highlight diverse ways the above reasons are important to electronic commerce: they are not as conditioned by social prejudices and political correctness; information shared between consumers, when it is produced between peers, is more relevant than publicity; consumers are able to continue searching for WOM online (see Goldsmith and Horowitz 2006). Most recently, according to Roy (2011), the distribution of joy, resentment, defense, narcissism and economic incentives is the most noteworthy of the important motivations at the time of performing eWOM on SNSs.

In Table 1, a synthesis has been performed of the main motivations for engaging inWOM and eWOM. Specifically, we have considered four main groups: (1) variables associated by degree of involvement and linked with an area, product or specific platform; (2) motivations characterized by the desire to help; (3) reactance and, (4) motivations characterized by the utility derived from involving oneself in this behavior. If the motivations are known, one can deduce that those media and users that present them will be more likely to perform eWOM in a particular setting. Additionally, it is interesting to encourage these motivations so

Table 1 Summary of the motivations for opinion-searching and for participation in WOM and eWOM

Variables authors		WOM			eWOM		
		(Dichter 1966)	(Blackwell et al. 2005)	(Sundaram et al. 1998)	(Balasubramanian and Mahajan 2001)	(Hennig-Thurau et al. 2004b)	(Roy 2011)
Involvement and ties	Product involvement	X	X				
	Message involvement	X	X				
	Self-involvement	X	X		X		
	Other involvement	X					
Aid	Concern for others		X		X	X	
	Altruism (positive WOM)			X			
	Altruism (negative WOM)			X			
	Helping the company			X		X	
	Dispense jubilance						X
	Helping the company					X	
	Platform assistance					X	
Reactance	Resentment						X
	Advocacy						X
	Vengeance			X			
	Exerting power over company				X		
Utilities	Anxiety reduction			X			
	Self-enhancement					X	
	Social benefits				X	X	
	Consumption utility				X		
	Narcissism						X
	Economic incentives				X	X	X
	Dissonance reduction		X				
	Advice-seeking			X		X	

Source Based on Roy (2011)

that eWOM be produced in an online platform. The detailed information offered in the chart is useful for giving a vision of the various possible motivations.

3.2 Social Networks: The Big Feeding Ground for eWOM

3.2.1 Social Components of eWOM

In order to understand the full potential of eWOM, it is necessary to be familiar with the social components that form it. First, we bring attention to the component referred to as *capital social*, understood as a group of existing resources within a social network which are used by its members (Helliwell and Putnam 1995). Social capital enables a virtual community to generate credible eWOM (Hung and Li 2010). As a result, one can predict the potential existence of eWOM in channels of communication if the existence of certain variable can be confirmed. Such variables include: social capital, strength of ties, confidence and interpersonal influence (see Chu and Choi 2011). In this area, Chu and Kim (2011) verified that the strength of connections, homophily, confidence, normative influences and information influences constitute the main precursors for the behavior of eWOM in SNs.

According to Mittal et al. (2008), strength of ties in a social network refers to "the potency of the bond between members of a network" (Granovetter 1973). (Brown and Reingen 1987a) demonstrated that bond strength has a large impact on the propagation of WOM, showing itself to be an antecedent of eWOM in SNSs (Chu and Kim 2011). The bonds that are considered strong are formed between family and friends with whom a close and energetic relationship exists, creating a personal network with strong emotional support. On the other hand, weak bonds in social networks are composed of less-close personal relationships, maintained with a large variety of contacts, which facilitate the search of information related to diverse topics (Pigg and Crank 2004).

The perception of the relationships' strength, based on bonds of varying degrees, is expected to foster consumer-to-consumer communication in SNSs. Consequently, information related to products will be disseminated at a higher rate when eWOM takes place (Chu and Kim 2011). Furthermore, social networks are more powerful when a higher concentration of individuals exists. This proportion of possible relationships determines the strength with which people are connected. In this scenario, individuals with a greater number of bonds are more connected and are able to contact a greater number of people while passing through fewer intermediaries. This more direct access to people and information increases the potential to influence others, rendering easier the transfer of information. Because of this, this density of bonds makes eWOM into a tool of wide scope; the use of this tool on social networks makes it easier to share one's individual opinion with a larger number of people.

Another of the terms associated with social relationships and eWOM is the concept of *homophily*, which is associated with the interaction between individuals with similar or congruent characteristics (see Rogers and Bhowmik 1970). Friends and members of a social network tend to have similar sociodemographic characteristics (e.g. gender, age, race, etc.), as well as similar attitudes and behaviors (Gilly et al. 1998). This is explained by the fact that individuals tend to socialize with similar contacts that possess shared characteristics. Therefore, as a question of compatibility, conversations more often occur between people with shared characteristics (Rogers and Bhowmik 1970). As a result, the higher the sense of homophily between members of a SNS, the better the flow of information within the network In this way, consumers who perceive a high degree of homophily in the network will be more likely to participate in eWOM with other consumers at the moment of choosing a product or service (Chu and Kim 2011). Recent studies have evaluated homophily in SNSs, showing that age and attitudes are major reasons for belonging to social networks like Myspace; gender was not proven to predict SNSs' membership (Thelwall, et al. 2010).

3.2.2 Consumers' Motivations to do eWOM in Social Networks

Based on the theory of social capital, individuals, referred to as "network capital," are assumed as antecedents of the process of creating eWOM. In other words, the number of people with whom one has contact, the close relationships and shared visions are going to have influence participation in eWOM.

Trust is one of the variables associated with the contacts of a social network and is also related to eWOM in SNSs. For Moorman et al. (1993, p. 82), trust is "defined as a willingness to rely on an exchange partner in whom one has confidence." As Pigg and Crank (2004) indicate, confidence assumes a key role in the exchange of information and in the integration of knowledge; it makes it possible to justify and evaluate decisions by allowing the most useful information to emerge. In this way, confidence in SNSs' contacts makes the information offered by a social network more credible and trustworthy, compared with unknown sources of information or publicity that is either uninteresting or of unknown origins. Moreover, in order to add a contact in certain social networks, one must go through a process that implies confidence towards others users, who are added as contacts, meaning the credibility of their messages must inspire high levels of confidence (Chu and Kim 2011).

Additionally, there is the *commitment to relationship,* which is defined as "the extent to which the research influences the user's decision making" (Moorman, et al. 1992, p. 316). Customers with high commitment are those who present a greater identification with the feelings of the business and a greater loyalty towards maintaining valuable relationships with said businesses. Therefore, they are customers prone to providing a favorable eWOM, consistent with their goal of maintaining a relationship with the business. Even when clients of this type experience only slight satisfaction, they still tend to support the business for the

sake of maintaining their cognitive consistency and justifying their favorable attitude or their strong identification with the business (Brown et al. 2005). Along the same lines, Brown et al. (2005) concluded that for clients committed to the brand, the behavior of positive eWOM was not particularly dependent on their level of satisfaction with the brand. This is because committed clients will speak positively about the business independently of their level of satisfaction, while clients with a lesser level of commitment will provide favorable recommendations in line with their level of satisfaction (Hennig-Thurau et al. 2004). Commitment, therefore, plays a very relevant role in the likelihood of users participating in eWOM (positive and negative) (Brown et al. 2005). Furthermore, there exists a direct relationship between satisfaction and loyalty and positive eWOM and its dissemination, and vice versa for negative eWOM (De Matos and Rossi 2008).

One of the key questions is: why do users participate in eWOM? Some of the main reasons for its use are (for more details, see Hennig-Thurau et al. 2003): risk reduction, search-time reduction, enhancement of their knowledge on a product, dissonance reduction, social position determination, membership to a virtual community, receiving incentives and for learning about new products on the market. Of all of these, the searching of information via the Internet in order to *reduce uncertainty* acquires an especially relevant role. Information searches can be divided into two types: on one hand, uncertainty of knowledge in relation with the notion of alternatives and, on the other hand, uncertainty about choice, associated with impending decisions. When having a number of decisions to make increases uncertainty about choice, the consumer tends to look for more information, in order to reduce uncertainty (Urbany et al. 1989). Therefore, at the time of making a purchasing decision, the level of uncertainty about the importance of the characteristics of a product or service will prove crucial. In uncertain situations, the consumer is more likely to obtain information by means of consulting experts on this category of product or service, as well as consulting other consumers (Smith and Bristor 1994). It is in this context that the role of eWOM is most noteworthy, as a complimentary source of information used by the consumer in order to reduce uncertainty associated with purchasing decisions.

With respect to valence of comments, when the comment is *positive*, it tends to be a result of the client's satisfaction with the product. This emotional state is positively related with the dissemination of eWOM (e.g., (Brown et al. 2005; Cheng 2009; Heitmann, et al. 2007; Wangenheim 2005). In the case of great satisfaction, the probability of making positive eWOM will be greater (Cheng 2009). Thus, it is not surprising that businesses are investing more and more resources in promoting positive eWOM through means of creation and sponsorship of brand websites and communities within SNSs in order to attract consumers and convert them into friends and followers (Jansen et al. 2009).

4 eWOM's Effects on Consumers

As previously stated, SNSs are an exceptional tool for creating and disseminating brand-related information. Contacts and friends of a social network generate the information, thereby promoting eWOM (Chu and Kim 2011; Vollmer and Precourt 2008). EWOM in SNSs affects the attitudes and behaviors of the consumer; In other words, information publicly shared on the forums of SNSs via comments, prescriptions or analysis (eWOM) affects the consumer. For this reason, evaluating its efficacy as a communication tool has wider implications in the business community.

The effects generated by eWOM have already been addressed by prior literature (Doh and Hwang 2009). eWOM produces an effect on consumers which is similar to the effect produced by WOM, although enhanced (Hennig-Thurau et al. 2004), and more efficacious than traditional means of commercial communication (Trusov et al. 2009). EWOM affects the customers' perceptions of issues such as: the value of a product (Gruen et al. 2006), sales, (Chevalier and Mayzlin 2006) and consumer communities (Dwyer 2007).

Nevertheless, if eWOM is not very credible, it is expected that it will affect the valence of the associations individuals hold towards the brand and, thereby, influence attitudes towards the brand. In particular, a lack of credibility of messages might trigger a simultaneous rejection by the consumer which, in turn, might provoke a rejection of the hosting website (e.g., a brand site, brand-related community, etc.). The study performed by Sweeney et al. (2008) focuses on improving the acceptance of eWOM, because the impact of eWOM on consumers hadn't yet been studied in detail until this time. The authors suggested that eWOM's influence must fundamentally depend on the following aspects: the nature of sender-receiver's relationship, the richness and strength of the message, its delivery and other diverse factors, both personal and situational, pertaining to the receiver of the message. Additionally, the variables that explain the use of eWOM information in the purchasing process are: the format (Wixom and Todd 2005), the trustworthiness or credibility of the message, and the ease of understanding the message (Cheung et al. 2009).

The level of risk perceived by users interrupts the diffusion of eWOM. On the other hand, involvement with the product has a moderating and positive effect on the diffusion of eWOM. Therefore, the greater the satisfaction with the product, e.g. higher degree of involvement and less perceived risk, the greater the odds of diffusion of positive eWOM.

In sum, the information obtained through WOM person-to-person is one of the most successful types of publicity, but is also the most difficult to obtain from a business standpoint. Researchers have identified three dimensions of eWOM specifically related to SNSs (Bonds-Raacke and Raacke 2010): a dimension of information (searching and sharing information), a dimension of friendship and a dimension of connection. Diffusion of news about products keeps with the above dimensions, making SNSs the ideal forums for WOM (Stockman 2010).

5 Conclusions

The proliferation of eWOM is one of the best manifestations of the social component of the online community (Chu and Kim 2011). In recent years it has been paid special attention within the framework of studies focused on the analysis of the impact and acceptance of publicity in SNSs. Nevertheless, there remains a lot of room to further knowledge of eWOM and how it can be used to commercial ends. A large and thorough study is, therefore, necessary, especially if one considers the huge increase of advertising investment in online media over the last few years (Bagherjeiran et al. 2010; Gathright and Wignall 2009; Probst 2011; Smith et al. 2007; Susarla et al. 2010; Tong and Yang 2010; Wang et al. 2011).

For these reasons, the study of eWOM has become a topic of growing importance for the marketing and academic worlds (Jansen et al. 2009; Riegner 2007). Its importance has been especially highlighted in social networks, due to the global phenomenon they have become (Raacke and Bonds-Raacke 2008) with regards to their role in the establishing of relationships, conversations and collaborations between users. Furthermore, there are innumerable opportunities presented that allow the users to actively participate with products and brands, among peers, through recommendations or through eWOM (Chu and Kim 2011). Consequently, businesses employ strategies more and more focused on eWOM, with the goal of developing solid relationships and enhancing the participation between consumers and their brands (Smith et al. 2007).

Internet social media enables the production of messages focused on the client in a way that allows the businesses to create and maintain long-term relationships with consumers. In this company-consumer bond, eWOM generated in social media becomes an important source of information and influence, amassing ever-greater importance in marketing's integrated communication actions (Mangold and Faulds 2009). Understandably, businesses are investing more and more resources in promoting eWOM; for instance, through the creation of brand-sponsored sites in SNSs that attract consumers in order to turn them into friends or followers (Jansen et al. 2009).

As Wu and Wang (2011) stated, independently of the degree of participation, the credibility of eWOM's messages' origin becomes an important factor that influences the formation and attitude towards the brand, trust towards to the brand, the fondness for the brand and one's purchasing intentions. However, at high levels of involvement with products, the power of positive eWOM's effect is reliant on the source's level of professionalism and credibility. Professionalism refers to the experience and knowledge of the message's provider, while credibility refers to the perception of the information's provider as reliable, worthy of trust, honest and sincere, traits that improve the credibility in the minds of consumers. On the other hand, at lower levels of involvement, the attitudes about the brand caused by eWOM do not really differ whether the consumer has an emotional or cognitive approach to the product.

The Internet and SNSs in particular have become a very important source of information about the analysis of products or brands, purchasing suggestions and criticisms of products (Hung and Li 2010). Consumers are exposed to eWOM through social platforms (Web 2.0) like blogs, chat, e-mail lists, forums (Gupta and Harris 2010) and SNSs in particular (Chu and Kim 2011). Specifically, it has been confirmed that there are no differences in eWOM behavior at a generational level, apart from the tools used to spread eWOM; i.e., younger generations make greater use of social networks, compared with more mature generations who primarily use email (Strutton et al. 2011).

Managing on-line communities in which eWOM is produced and generated is of interest to businesses. The better a business manages and processes content related to its brand that is generated in online communities, the greater its competitive advantage in social media will be over businesses that do not control eWOM to that extent. It is, in turn, logical that positive eWOM has a positive influence on a business's global competitive position in its targeted markets.

6 Implications for Practitioners

In this section some relevant managerial implications are highlighted.

Businesses must perform analyses of social networks used by their target segments. For businesses that use social networks, it is essential to know if their target clients are using the same SNSs as them. Similarly, it is crucial to be familiar with the profile of the target segments, including their behavior in SNSs. Companies should be aware of the fact that a social network is usually visited for its supply of unique, trustworthy information, so they emerge as communication platforms with enormous potential to spread influence. Thus, better knowledge of the social networks' users is helpful to companies in order to fully exploit, with accuracy, the commercial potential of SNSs.

EWOM's organic appearance should be promoted. Members of the community produce organic eWOM, voluntarily and in order to help others. To promote this, some social networks such as Facebook incorporate automatic advertising messages, based on the interaction between our contacts and brands, with an organic appearance into their communications. One of the main outputs of eWOM for businesses is the generation of positive eWOM, which is a highly desirable result. Firms are presented with the important challenge of being capable of processing and managing eWOM in a manner that generates messages and content favorable to their brands.

The virality of positive eWOM should be promoted. To that end, platforms that are useful and easy to use should be employed. The visibility of messages created by members of the community must be recoverable, visible and accessible to others. Moreover, businesses ought to promote the possibility of linking and sharing the information created by integration of links from distinct social networks; e.g., comments from a blog that also appear on Twitter, Facebook, etc. The

objective of the sellers and advertisers that want to benefit from the effects of viral marketing ought to be to focus on platforms that tend to the informational needs of their user community and that have influential users.

Participation of people perceived by other users as experts should be promoted. It is convenient to recruit influential individuals within a social network of interest to the business. Nevertheless, businesses ought to know that consumers are capable of distinguishing between experts whose opinions are at odds with the recommendations of other on-line consumers; on occasion users' opinions can be perceived as more reliable than those of the experts (Chien-Huang et al. 2007). The belief exists that future generations will be more much influenced by other consumers' eWOM than by the vendors. Those in charge of marketing are observing that analyses from on-line consumers are increasingly influential, which is the reason for advising the allocation of more resources to online channels (Zhu and Zhang [Michael] 2010).

Techniques to localize and incentivize the participation of prescribers within a social network should be used. It is important to monitor the distinct users of social networks, through the use of key words, number of visits to the comment sections, number of comments, number of videos created, etc. in order to understand which users have a higher chance of acting as prescribers. Once identified, it is advisable to give them special attention in order to convince them of the positive qualities of promoted product or service. Nevertheless, the analysis of the literature reveals that new users and experienced users are equally as likely to share marketing messages with others (see Smith et al. 2007), since eWOM's behavior emerges from the basic human needs to be useful and to give advice. In this way, people, in general, share and enjoy the search of valuable information. Therefore, one should not underestimate the large potential for recommendation about products, held not only by individuals who are considered influencers, but also by the majority of consumers. For instance, Lee and Youn (2009) have observed that reading eWOM-related comments posted by unknown people is common practice among those consumers with a situational, low-involvement online shopping process.

Finally, due to the strategic value of eWOM in SNSs, its management and control ought to be carried out by professionals, hence the importance of the community manager (see Garrigos-Simon et al. 2012).

7 Future Research Opportunities

With regards to future research lines, it is advisable to study the effect of eWOM on the comments and analyses of products, where the identity of communicators is sometimes known and sometimes unknown. In this area, it will be fundamental to establish what level of exposure to comments made by unknown individuals is necessary to produce changes in consumer's behavior at the same level as those produced by known users. It will prove equally interesting to observe the possible

differences that can occur in the function of eWOM when the product is real but unknown compared with fictitious or development-stage products.

The majority of experimental studies that evaluate the effect of eWOM on consumers subject the individuals to a mandatory exposure to eWOM. Because of this, a study of the effects in a trial with more natural conditions and setting, where the consumer voluntarily selects eWOM communications, is fundamental in reaching a real understanding of the phenomenon.

Additionally, to obtain a large generalization in the study of diverse categories of products, it is helpful to work with two groups: hedonistic products and utilitarian products. Likewise, within each group the degree of perceived risk of purchasing as well as the degree of involvement and experience, among other variables, should be considered, with the objective of obtaining a larger potential set of results.

Finally, it would be interesting to analyze differences according to the type of user when processing the valence of eWOM. In this sense, sociodemographic or psychographic differences could be considered. Moreover, a comparative analysis between SNSs of the effect eWOM has on their users' behaviors could be key to knowing the viral potential of every platform.

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Qualitative Analysis of Online Communities to Support International Business Decisions

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Abstract Social, cultural, political and technological forces have significantly transformed the competitive landscape of the global economy. Amongst these forces, technology has arguably had the most rejuvenating impact on the way international businesses interact with each other and their customer base. End-users are making use of computer-mediated communications, newsgroups, chat rooms, email list servers, personal World Wide Web pages and other online formats at an unprecedented pace, and as they share ideas and obtain information about products and services, firms are extending their market research activities to these domains. These new tools, online communities, virtual communities and virtual worlds have emerged as a fascinating and useful pool of collective experience for international business. However, the utilization and analysis of this body of knowledge for international business decisions is still in its infancy. This paper analyzes the potential of these tools to inform international business decisions. We explain how to identify and access each of these communities, and how to convert the qualitative information available from online communities into a strategic input for the firm.

Keywords Communities · International business decisions · Qualitative research · Market research · Network innovation

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1 Introduction and Motivation

The capacity to innovate and the ability to respond to, if not shape, the competitive environment is key to sustained firm performance (Molina-Castillo et al. 2011). While the literature has produced extensive empirical accounts on how to facilitate and manage innovation within firms, an extension beyond firm boundaries, specifically to firm-customer relationships and networks, has not received so much attention (Evanschitzky et al. 2012). This is remarkable as functional integration of economic activities across a wider geographical space is dramatically increasing the number of economic actors participating in the quest for superior innovation performance. Lew and Sinkovics (2012, p. 247) produce an integrative innovation matrix along the dimensions "commercialization" and "source of technology deployment" leading to (a) closed innovation, drawing on a firm's internal resources, (b) inbound innovation, drawing on resources external to the firm, (c) inside-out innovation, whereby firms stimulate innovation via the provision of a network-level platform (such as the Google Android operating system) and (d) open network innovation, making use of resources external to a firm, offered by a community such as Linux open source.

This paper draws specific attention to cell (d) in their framework, termed 'open network innovation' because "networks of actors can benefit from the technology developments contributed by networks of actors (for example, volunteer communities or a business ecosystem)" (Lew and Sinkovics 2012, p. 248). This idea corresponds to suggestions from the network innovation literature, where the interaction between users when using a product reinforces the value of the product itself (Molina-Castillo et al. 2011). The argument in this paper is that value can be created through capturing and commercializing external resources available at the network level. New technologies provide extraordinary new tools for firm-customer interaction, relationship building, and information sharing, variously termed "online communities" (Jang et al. 2008), "virtual communities" (Blanchard 2008; Brodie 2009) or "virtual worlds" (Hendaoui et al. 2008). Computer-mediated information exchange between consumers is considered objective and reliable (Casaló et al. 2010), suggesting that the feedback about products and services offered via this channel may supersede traditional measures (Chen and Hung 2010).

The advent of networked computing is opening new opportunities for research and innovation in international business (IB) (Mandiberg 2012), consumer analysis (Nambisan and Watt 2011), new product decision making (Wu and Fang 2010), brand extension into the market (Song et al. 2010), the generation of brand relationships (Zhou et al. 2012) and, in turn, the evaluation of the potential value of communities (Spaulding 2010). This explains why there is an increasing interest in learning about communities (Wang 2010), and how to organize (Scarpi 2010) and manage them (Dholakia et al. 2004; Mahr and Lievens 2012).

Within this paper, a qualitative approach is pursued to analyze online communities and to demonstrate how the insights obtained from these communities can be used for IB decisions. This is in line with Marschan-Piekkari and Welch

(2004), who suggest that qualitative methods are becoming increasingly important in IB research. It also builds on Sinkovics et al. (2005), who argue that qualitative methods help us to see what is behind all the numbers and thus cope with information overload, offer a toolset to understand the multilayered dimensions of globalization, and allow techniques to be tailored to the research problem rather than vice versa. Furthermore, the online community environment is still a relatively new phenomenon and despite some acclaims of the extraordinary use of online communities for interaction, committed exchange and relationship building (Ciaramitaro 2011; Kietzmann et al. 2011; Rheingold 1993), there are critical accounts pointing at the exaggerated value of online interaction for marketing communication and advertising (Clemons et al. 2007), meaningful interaction and connection (Turkle 2011) and successful firm internationalization (Yamin and Sinkovics 2006). Thus, a qualitative, exploratory approach in analyzing online communities is deemed appropriate to offer insights (Ghauri et al. 2009) about the value of online communities for IB decisions, while a structured approach to analyzing the data via computer assisted qualitative data analysis (CAQDAS) will help to enhance the trustworthiness of our findings and enable us to contribute to theory (Sinkovics and Alfoldi 2012; Sinkovics et al. 2008).

The paper is structured as follows. First, we provide some conceptual background on communities and motivate the research by pointing at the paucity of conceptual and empirical work on online communities in the IB literature. We then introduce social exchange theory to explain consumers'/individuals' motivations to contribute to the development of these communities and how it relates to network innovation literature. We then explore conceptually how various types of communities and interaction between users can help IB managers and decision makers, who may tap into the information generated. This information can support IB and management decisions. In the ensuing chapter, we offer an empirical example that demonstrates how the qualitative, text-based information available in online communities can be analyzed by means of computer-assisted qualitative data analysis (CAQDAS) and how the findings can support marketing decisions. We conclude by outlining the limitations of this study and providing implications for future work.

2 Conceptual Background

2.1 Online Communities and the Changing Landscape of IB

The management literature is unambiguously firm in its assessment that the collective power of online communities is shaking up existing industries (Hof 2005). Various forms of sharing, facilitated by information and communication technologies (ICTs), are likely to change the status quo in a number of sectors. For instance, the telecom sector has experienced dramatic competitive pressure, with

more than 100 million people now using Skype software to share processing power and bandwidth and call each other for free over the internet. In a similar vein, the entertainment, and specifically the music and video, industry has experienced challenges due to the sharing of proprietary assets over online networks. Similar disruptions and changes are taking place in the software, retail, finance, media and advertising industries. As online networks are becoming the locus of innovation, firms are becoming more porous and decentralized (Hof 2005).

Despite this significant, technology-induced shift, the academic IB literature has been relatively slow to provide conceptual and empirical contributions regarding online communities and their ramifications for the IB agenda. ICTs, more broadly speaking, have indeed been discussed, for example regarding the economic geography of business in the internet age (Leamer and Storper 2001) or the potential impacts of ICT advances on IB theory (de la Torre and Moxon 2001). However, research on the specific implications of online communities for IB issues has so far been confined to functional disciplinary journals devoted to marketing, consumer behavior, information systems or the channels literature (e.g. Bagozzi and Dholakia 2006; Brown et al. 2007; Kozinets 2002; Scarpi 2010).

Kogut and Zander (1993), in their seminal piece on the knowledge of the firm and the evolutionary theory of the multinational enterprise (MNE), suggest that firms are 'social communities' that specialize in the creation and internal transfer of knowledge. Yet, the key focus of their analysis is the internal community perspective. In this paper, we decidedly extend the perspective beyond the firm to the network and examine resource externalization (Lew and Sinkovics 2012, 2013) via open online communities and the implications for innovation at the network level. We examine in how far online communities can create value for firms to support IB decisions, specifically enhance innovation generation and support internationalization decisions.

2.2 The Nature of Online Communities

Online communities are 'social aggregations' that emerge from the Net when enough people carry on those public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace (Rheingold 1993). With literature on online communities emerging from the consumer behavior literature (Nambisan and Watt 2011), the marketing literature (Mandiberg 2012) and the information systems/ICT literature (Kim et al. 2011), a unified definition is not yet available. Muniz and O'Guinn (2001) suggest that online communities often involve consumers attempting to inform and influence fellow consumers about products and brands. Kollock and Smith (1999) simply argue that an online community is a social network that uses computer support as the basis of communication. Others highlight the relational dimension of online communities (Chan and Li 2010). Preece (2000) suggests that online communities are made up of people who interact socially to satisfy their own needs or to perform special roles with a shared purpose, and whose interaction is guided by tacit and explicit policies, with

computer systems supporting and mediating the interaction. In a more academic conceptualization, Andrews et al. (2002) posit that a community is not a physical place but a set of social relationships. They suggest that, although the members of a demographic group may share common interests, needs and goals, they do not necessarily comprise a community unless the group establishes a network of social relationships. These relationships are now achieved online, in virtual spaces created through a combination of communication and content developed by community members (Jang et al. 2008). This can include the sharing of goals and ideas, with no constraints on geographical location or ethnic origin (Hsu and Lu 2007). The objective, as Sun et al. (2012) point out, is to achieve sustained participation in these communities.

Kozinets (1999) defines online communities from a marketing and management perspective as networks of people whose online interactions are based upon a shared enthusiasm for, and knowledge of, a specific consumption activity or related group of activities. Online communities differ from face-to-face communities in that there is a lack of real-world physical cues, and members have the ability to change their identity, social status, and purpose. Brown et al. (2007) demonstrate that the flow of information between participants in online networks may be different in nature to that in an offline context. Online communities can be supported by a variety of internet technologies, including Usenet newsgroups, list servers, bulletin board systems, and websites.

According to Armstrong and Hagel (1996), communities can be classified based on transaction, interest, fantasy and relationship types. Winkler and Mandl (2004) differentiate between asynchronic and synchronic computer-mediated communication, where asynchronic formats includes web forums, newsgroups and mailing lists, while synchronic formats include chats and multi-user dungeons (MUDs). Within the empirical section of this paper, the massively multiplayer online role-playing game (MMORPG) World of Warcroft (WoW) will be used. This is a synchronic form of online community, as multiple players interact at the same time and certain interaction modes, such as ‘whispers’, allow players to interact in real time.

Recent work has analyzed whether the size of the community is important and has concluded that the members of small communities develop greater community loyalty (Scarpi 2010). Other work has considered the positive and negative effects that could arise from communities. For example, community interaction is considered an important dimension when engaging with customers and there are suggestions that a lack of e-service support may lead to harmful effects for firms (Tsai and Pai 2012). In terms of communities that are relevant for IB, Sinkovics et al. (2009) provide a graphical representation of online communities along two dimensions, commercial/social value and the nature of the exchange (creative, playful or functional). Their examples include Facebook, LinkedIn, Moodle and WOW, the last of which is a ‘virtual world’ online community (Gardiner and Ritchie 1999), that is, a simulated environment that reflects the real world very closely in that it includes representations such as people, landscape or other objects (Kock 2008).

2.3 Social Exchange and Network Innovation

Social exchange theory is fundamental to understanding behavior between individuals and within groups. It explains why people help each other, and why there is information exchange and support between group members (Cropanzano and Mitchell 2005). The theory demands that virtual interaction has to be rewarding for both producer and participant (Anderson et al. 1999; Emerson 1976). This reward is essential because, as Wasko and Faraj (2005) point out, consumers spend time and effort in community environments with no immediate benefits for the contributors. While there is increasing research on social exchange processes in virtual communities (Hemetsberger 2002) and the 'open' dimension of innovation and exchange (von Hippel and von Krogh 2003), there are still many unanswered questions regarding the value propositions for community users and the attraction for visitors (Gu et al. 2007).

Social exchange theory has considerable theoretical value for the analysis of innovative user behavior in an online community context. Andrews et al. (2002) provide a framework for demographic groups that are resistant to online community interaction. They suggest that good sociability creates an online culture where people feel comfortable interacting and their expectations are met.

Kozinets (2002) comments that participants in online communities are often engaged in informing and influencing fellow consumers about products, brands or organizations. This knowledge-sharing process is critical to understanding why and how individuals choose to exchange knowledge with other community members (Chen and Hung 2010) and could imply a very important source of knowledge creation for innovation (Mahr and Lievens 2012). Customers and consumers rarely innovate in isolation; they do so in cooperation with like-minded people. Acquaintances, colleagues and friends contribute know-how and offer the active support necessary for transforming ideas into products (Füller et al. 2007). Füller et al. (2006) develop a community-based innovation method to access online communities, and identify how firms might interact with community members to obtain valuable input for new product development. The idea behind this approach is how to co-create value between partners in order to obtain a product that better fits customers' demands and has high chance of profitability (Perks et al. 2012). They suggest that, in order to utilize the full innovative potential of consumers for virtual design, communities should provide a stimulating environment that enriches consumers' creativity and offers functionality that helps participants to work jointly on a problem. Thus, understanding consumer-to-consumer interaction is critical to analyzing the behavioral intentions of these customers and how the communities influence them (Chan and Li 2010). Furthermore, communities may help to identify the needs and desires of particular individuals or groups of people (Casaló et al. 2008), and rapidly disseminate knowledge and perceptions regarding new products (Dholakia et al. 2004).

Despite these attractive features of communities, to date community members have rarely been included in firms' core value creation and new product

development processes. The use of communities has so far been limited to somewhat typical market research activities (Füller et al. 2006). Balasubramanian and Mahajan (2001) discuss various perspectives on the role and implications of virtual communities and their economic leverage. Füller et al. (2006) suggest that, with new developments such as the 'toolkit approach', customers might even be able to develop their own new products. This perspective is essentially aligned with the open network innovation approach, which extends beyond the traditional IB focus of the firm, as conceptualized by Lew and Sinkovics (2012).

Social exchange theory is closely linked to the network innovation economic literature. In a business to business context, inter-organisational innovation happens when firms learn from other firms they are related by "producing sets of inter-organisational experiential rules that are partly separate from the rules of each of its members. Thus, the inter-organisational collaboration is in itself stressed as a unique learning entity" (Holmqvist 2004). Inter-organisational exploration consists on the firm's use of explorative knowledge that proceeds from, or is developed in the setting of, its business relationships with the main purpose of obtaining a better product. In a consumer to consumer context, this network innovation is operationalized with the term network externalities. As the economy becomes more interconnected, more products exhibit network externalities (Srinivasan et al. 2004). Therefore, in these markets the utility of a product depends not only on its attributes, but also on the number of consumers who have adopted the product ant the network of users created around them. These users co-create value with its mere interaction which can even override the benefits of the product itself. Direct network effects occur when the value of a good to any user is an increasing function of the network's size (Farrell and Saloner 1985). The effect is simply generated from the growing number of users adopting the same product. Direct network effects are also called demand-side economies of scale (Katz and Shapiro 1986) or economies of mass adoption (Norsworthy and Lee 1998). In a business to consumer context, this network innovation arises when indirect network externalities exist. Indirect network effects occur when the introduction of complementary goods by a firm increases as the sales of the primary good increases (Lee and O'Connor 2003). Therefore, firms will be motivated to launch more products related to this network of products in order to increase the value perceived by customers (Basu et al. 2003).

2.4 Qualitative Methods for the Analysis of Online Communities

In terms of research methods, a number of options exist for the analysis of online communities. These can be seen as complementary to other methods used to study market research on the internet.

Online Delphi: The aim of the online Delphi method is to generate reliable and relevant information about issues where only incomplete knowledge is available.

The method is used to ascertain future trends or developments in specific markets, or to assess the potential of firm innovations (Okoli and Pawlowski 2004). An online Delphi usually extends over a couple of months and participants are usually required to respond twice. The method is rather similar to the use of panels, in that it encompasses the same topics, but it is more limited in terms of its duration (Rowe and Wright 1999).

Netnography: Netnography is fundamentally based on the principles of ethnography, whereby group behavior and the individual behavior of group members is actively researched via the group participation of the researcher (Hitzler 2007). In the internet context, the unit of analysis is the conversation or social interaction exhibited by group members. Members of online communities can thus be analyzed with respect to their thinking about specific topics, how they assess various products or brands, and which specific threads of communication emerge via community interaction (Beckmann and Langer 2007). Kozinets (1999) introduced a four-step netnography method: (1) accessing a community (cultural entrée), (2) collection and analysis of data, (3) interpretation of data, and (4) consideration of ethical dimensions.[1]

Analysis of textual data: There are a number of conceptual papers and methodological contributions that suggest processes that can be used to generate insights from textual data, specifically those derived from expert interviews (Kuckartz 2007; Sinkovics et al. 2008). Sinkovics et al. (2008) suggest adhering to specific operational standards in the application of the research process and the analysis of the qualitative data, in order to overcome criticisms about the trustworthiness of qualitative data analysis and the underlying data structures (Guba and Lincoln 1989). As online communities offer a plethora of codified textual data, CAQDAS is ideally suited to help the process, improve the efficiency of the research process, and augment inter-rater reliability and the generalizability of the data (Penz et al. 2005; Sinkovics and Alfoldi 2012; Sinkovics et al. 2008).

3 Methodology

To investigate the contribution that the analysis of online communities can make to support IB decisions, such as innovation generation from a network perspective and market entry and development, we draw on netnography (Kozinets 2002). Text-based material is analyzed following some of the guiding principles of grounded theory (Strauss and Corbin 1994; Strauss and Corbin 1998). Both netnography and grounded theory require close interaction between researcher and the underlying qualitative text-material, and lead to an iterative process in coding

[1] Netnography is different from (social) network analysis. The latter is fundamentally a quantitative analysis, which uses nodes and edges to gauge the strengths of connections between individual members of a group as well as determine the structure of the net (Carrington et al. 2005; Wasserman and Faust 1994).

and analysis. Through continuous development and re-negotiation of insights from theory and interview data, trustworthiness, and transparency of the process and its findings are enhanced (Sinkovics and Alfoldi 2012).

Online gaming has become extremely popular of late and is overtaking the PC and console gaming market. Research estimates that the revenue from online gaming will be $25.3bn in 2014. Drivers for growth are high-speed broadband connections, increasing internet penetration, and the growing popularity of social networking sites. Europe, the Middle East and Africa (EMEA) accounted for about 37 % of global revenues in 2009 but its share is expected to decline in 2014. Asia–Pacific, on the contrary, shows fast growth, with China the largest market, accounting for about 51 percent of this region's revenues in 2009 (Business Insights 2011).

The key research questions that inform the empirical explorations are as follows: (a) What is the value that companies are able to attach to the analysis of data from online communities, specifically online discussion boards and community forums? (b) What knowledge can be retrieved from MMORPG forum discussions? (c) How can online community information be used to provide continuous interaction between developers and users, and thus act as a basis for the establishment of relationships and open network innovation? The research questions are examined from a cross-cultural perspective taking cultural (e.g., values, norms) and social (e.g., norms, exchange) characteristics of online communities into account. This allows covering IB relevant diversity of community activities. In particular, German and Chinese forum discussions are selected because it is assumed that cultural and social diversity is large between these groups. In addition, German- and Chinese-speaking communities differ with regard to factors such as prevalence of online communities and diffusion of technology.

There are a number of official forums of MMORPGs and these are usually linked to the developer's website and hosted by the company. Game developers provide web forums to facilitate interaction between users. In addition, private users or groups often start forum discussions themselves with like-minded users. In general, web forums are usually organized along thematic threads that are game-specific. In addition, these forums include areas where off-topic matters can be discussed. Only registered users can post comments; however, anyone may search the discussions and read the comments (Kozinets 1999; Kozinets 2002).

In our study, the German and Chinese-speaking web forums are selected on the basis of the popularity of the games discussed. First, the empirical research focuses on one of the most popular MMORPGs worldwide, WoW (developed by Blizzard Entertainment), and investigates text-based information from German and Chinese users of the respective WoW online communities. In addition, two games with German-speaking and Chinese-speaking communities, respectively, were selected to account for culture-specific idiosyncrasies. These are EVE Online (German-speaking, developed by CCP Games, Iceland) and Perfect World (Chinese-speaking, developed by Beijing Perfect Word). Other selection criteria for these games were the types of topics discussed in their web forums, the number of posts, the availability of the games and access to the web forums (See Tables 1 and 2).

Table 1 Selected threads in German and Chinese-speaking communities on the topic "motivation to play MMORPGs"

German-speaking communities	Threads	Answers	Hits
World of Warcraft			
Official German-speaking forum	Motivation?	20	1,473
German World of Warcraft website inWoW.de	Why do you play WOW?	159	4,616
	What motivates you?	62	2,174
	Motivation?	44	1,862
EVE online			
Fansite EVE Germany	EVE is fun, because….	44	1,957
Chinese-speaking communities			
World of Warcraft			
Official Chinese-speaking Forum	Is there any better game in the world than WOW?	19	729
17173 WoW Forum	When playing this game I feel very happy	48	440
	Shall I give up The legend of Mir for WoW	46	394
Perfect World			
Official Chinese-speaking forum	Why do you play Perfect World?	131	3,434
Unofficial forum Gamebase	What are the reasons to continue playing WoW?	16	887
	One question, how do you like Perfect World?	16	1,436
	Perfect World is my No 1	17	3,598
	What is the main reason for playing Perfect World?	82	733
	What about the game attracts female players?	85	3,746

Note "Answers" refers to the number of replies from other users in the same forum, "Hits" indicates the number of times the respective thread has been viewed

In WoW,[2] players choose between two factions, "horde" and "alliance", that have specific races and characters who fight against each other. Blizzard offers hot-selling extensions to the WoW game, which allows them to retain interest among existing players. In EVE Online,[3] players primarily fight and trade in cyberspace. In this MMORPG, many users can play simultaneously. In December 2007 approximately 41,000 players were online simultaneously, setting a new record for this kind of game. Perfect World[4] is an online fantasy role-playing game based on traditional Chinese myths. Although developed as a Chinese online game, an international version is now available through overseas licensing. Similarly to in

[2] WoW had a paid subscriber base of 12.1 million at the end of 2010 and holds more than 60 % of the global MMORPG market (2011).

[3] EVE Online had 200,000 subscribers by the end of 2010 (Business Insights 2011).

[4] Perfect World uses a 'freemium' business model, which means that use of the game is free but users are charged for items within the game.

Table 2 Selected threads in German and Chinese-speaking communities on the topic "critiques of MMORPGs"

German-speaking communities	Threads	Answers	Hits
World of Warcraft			
Official German-speaking forum	Better graphics, please…	105	2,159
German-speaking community wow.gamona.de	Play classical quests? Sheer impossible…	36	2,893
	Is it old hat?	49	3,579
German World of Warcraft page inWoW.de	Now I am caught, too	72	6,453
	Return of the lags!	48	1,886
	The most silly answers by < GM > ′s	28	2,974
EVE Online			
Fansite EVE Germany	What annoys you most about EVE?	86	4,436
	EVE only bores me…	491	22,789
Chinese-speaking Communities			
World of Warcraft			
Official Chinese-speaking forum	We request vehemently the people at The9 to work long hours so that the servers are running again before 8 pm!	62	2,442
17173 WoW Forum	We request that The9 amend the maintenance time for servers	13	338
Perfect World			
Official Chinese-speaking forum	You easily get bored at Level 100. I have just noticed a big flaw in Perfect World.	85	3,161
Inofficial forum Gamebase	Too many tasks in the game, one simply cannot comply with them.	60	5,840
	Maintenance at 2:30 without prior notification … protest	18	3,376
	The game is so boring. What do you think?	24	2,030

Note "Answers" refers to the number of replies from other users in the same forum. "Hits" indicates the number of times the respective thread has been viewed

WoW, there are different races and tasks involved. Players can build their avatars using a wide variety of features, making the game very exciting graphically. Overall, the three MMORPGs selected for this research have similar structures and the games are organized similarly but they differ in content (trading versus fighting) and design (2D versus 3D). This makes them suitable for a cross-cultural comparison of web forum discussions.

To start the data collection process, the research team discussed the selection of topics (threads). Two major topics were chosen in order to support the research questions: (1) motivation for online gaming and (2) critiques of the games. This selection of threads is critical to the ensuing analysis. Some web forums do not offer a search function, and where searches are available they do not always return adequate results. Therefore, the threads were screened manually for evidence of

content referring to 'motivation' or 'critique'. Some of the thread titles were not useful either because they did not match the contents.

Over a period of one month, two research assistants scouted for relevant topics within the web forums which could provide useful input for IB decisions. The digital text from the web forums was imported into the CAQDAS tool NVivo for further organization and subsequent analysis. NVivo (Richards 2005) allows text to be coded and a node system can then be derived based on the coding. This procedure formed the basis for further analytical queries and searches for evidence in the data corpus. Coding was done iteratively: First a rough node system was developed based on the structure of the threads. Later, the coding was refined following the grounded theory techniques of axial and selective coding.

3.1 Findings: Motivation and Critiques

The main two topics of interest for both language groups are (a) 'motivation to play online' and (b) 'critiques of games'. Motivation is subdivided into 16 categories (subnodes), and critique into 14. We found that the users tended to have similar motivations for playing and tended to criticize certain common aspects of the games.

In order to answer the research questions, matrix coding and coding queries were run using NVivo. The selected attributes (game: WoW, EVE Online, Perfect World; language-group: German, Chinese) were combined with selected nodes. The result was a list of references, referring to statements made by users in the online communities. These statements could be either single words or sentences reflecting the respective nodes. Frequencies should be interpreted with caution though because they do depend on the wordiness of expressions in different languages, as well as on the number of threads selected on the topic in question. However, they provide a useful starting point for examining the users' statements in more detail and theorizing about patterns and relationships.

In the following, the results are discussed in relation to various themes that emerged. These themes can be divided into *firm/developer-related* versus *user-based (or individual)* and are discussed along the cross-cultural dimension. In the case of the *firm/developer*-related aspects, technical and business-model-related themes appeared. Insights from this kind of feedback can be transferred into product and service development within firms. Regarding their *individual* situation, the users stressed mainly psychological and social subjects and provide evidence for social exchange processes. As illustrated in Table 3, relationship management is critical for products such as MMORPGs. Users' perceptions of the game, both firm-related and user-related aspects, are expressed in online communities.

There are differences in the number of contributions to each topic coming from each game and from the German-speaking and Chinese-speaking forums.

Table 3 Overview of results

	Technical	Business model
Psychological	E.g., good design/graphics allows user to escape from real world	E.g., avoiding addiction through subscription versus item-based models
Social	E.g., meeting, connecting to others (virtually), peer to peer mode, translating the physical into a virtual world	E.g., 'freemium' models for users who cannot afford expensive prices (→emerging markets)

3.2 Firm-Related Aspects Related to Motivation to Play and Criticism of MMORPGs

The firm/developer-related issues mainly consisted of *technical questions and comments*, including for instance support, maintenance, connectivity, updates, the graphical interface and the performance of the game. Looking at users' opinions provides firms with decisive information about what features of a game should be kept, and contributes to product innovation and development. It also helps to identify areas where more support and a greater company presence is required, or with regard to cross-cultural idiosyncrasies, actions need to be adjusted to the respective context. Taking the exchange of information at this network level into account, international businesses can benefit from knowledge generated externally.

Technical aspects were more often discussed in the Chinese forums as motivating online game playing. Chinese users particularly stressed the design and graphical features of the games. In particular, Perfect World's 3D graphics were found to intrigue the Chinese-speaking users. This is not surprising since Perfect World (the Chinese game) is particularly known for its good graphics and therefore the positive sides of it tend to be brought up in forum discussions. In the official forum for WoW too, design is discussed as a driver of pleasure (e.g. "the environment, the atmosphere, each tree, how characters are looking, the movements—who knows of a game [whose] graphic is more beautiful than WOW?"). The way the virtual characters (avatars) can be designed appears to be one of the most fascinating aspects of MMORPGs for Chinese-speaking users.

For the German-speaking forums, graphical issues related to hardware and outdated graphics were issues that came in for criticism. Among the other technical issues raised by both language groups were connectivity and login problems; maintenance was perceived to take too long, was unexpected, and happened too often or at the wrong time. Support was criticized; bad customer service was mentioned in terms of both quality and speed. The latter issues were particularly common among Chinese WoW forum members and targeted the Chinese WoW support firm, 'The9'. For the Chinese users, the main critique in terms of content updates was the lack of new features, while the Germans also referred to new content but also commented that improvements in general were lacking. In criticizing content, the Chinese players argued that the number of open missions was

limited, the game concept was bad, the game was one-sided, the virtual world was too small, the game itself was poor, there were too many tasks and levels in the game, and that there were not enough tasks. Chinese users also compared different games a lot, typically expressing the view that Chinese games were worse than or copied from other games.

A more business-focused topic relates to how users evaluate games based on cost. Perfect World, as an item-based MMORPG, seems to be preferred because it is free to use it, and the user only has to pay if he/she purchases game-related items or services. The advantage of this cost model is referred to in online web forums as a motivation for keeping on playing. However, mainly German-speaking users discussed the issue of 'becoming addicted' in the forums for the subscription-based games, especially WoW. This issue clearly has a psychological nature (for more details on this, see the next section). However, it also has a business model side. For example, users talked about trying to stop playing WoW but failing to do so. In response, fellow users suggested cancelling their account for a while. These examples illustrate that the chosen business model (subscription versus item-based) might have both psychological and financial influences on users.

Finally, some of the comments referred to the celebrities (e.g., supermodel Lin Chi Ling in Perfect World) who promote these games by creating characters for themselves and offer celebrity endorsement. The Chinese-speaking users appear to be very susceptible to this kind of advertising based on their postings in the forums. This form of endorsement motivates them to play the MMORPGs and encourages purchasing of the advertised products. However, this does not seem to be the case for WoW. The company invested in advertising using celebrities (e.g. Jean-Claude van Damme) but no mention by users of the game of this was found in the online web forums. As in the physical world, the selection of appropriate celebrities within specific target segments is key. Advertising-based business models are viable options for MMORPGs and this may lead to the development of alternative, cheap games for certain user segments.

3.3 Individual Aspects of Motivation for Playing and Criticisms of MMORPGs

Individual comments included psychological and social aspects and reveal social exchange processes within culturally diverse communities. With regard to intrinsic motivation, the Chinese players produced more comments than the German players. In both cases, users referred to escaping to a different world. The Chinese users elaborated on this by commenting that they could live out their fantasies, travel through fantasy worlds and that they enjoyed the environments created. In the Chinese forums, the users commented that they liked the idea of being someone else and being able to create new characters. For many, the games and the characters they create stir up emotions that remind them of actual people,

events and feelings from their past. The German-speaking users, on the other hand, suggested that the games could be improved if the users could act as developers, creating designs and atmosphere. This would increase their feeling of escaping from the real world. While Chinese-speaking community members stress hedonic, socially compatible forms of exchange, German-speaking community members emphasize creative innovation and collaboration.

Both language groups argued that the games are entertaining, easy to play, full of music, sounds, animation etc., and they like the contents of the games. The users generally also seem to like killing monsters and avatars, in other words their ludic drive needs to be satisfied and the games help with this. Especially in the German-speaking forums and with regard to WoW, the players often stressed the fun factor in achieving something or leveling up. They generally argued that these games are relaxing, and offer a somewhat habitual way of spending time, but they also mentioned dependence and constraints, that they had invested a lot of time and money already and want to experience more with these games. This corresponds to the discussion above on the addictive potential of (subscription-based) MMORPGs. Feedback from users with similar problems seems to be found useful and thus these online forums seem to provide an additional benefit to the users, in that real-life problems can be discussed on them.

A major psychological issue with MMORPGs is a lack of fun when playing the game, leading to "boredom", which was one of the most common critiques in the forum discussions we studied. Boredom was cited as a critical factor in quitting playing by (Chinese) Perfect World users. The main arguments were that it is too repetitive and tasks not challenging enough. Some users commented that their friends had quit playing the game and that this had also had an impact on their decision. Thus, there are social factors at play here as well. The Chinese users felt that reaching the next level was laborious and the tasks were repetitive. They argued that friends and many other players had quit the game, that there was no help from others in the game and that the game had therefore become boring. German users, on the other hand, mentioned that it was difficult to connect to other players. This issue has two sides: first, as a negative consequence, users look for more interactive games; second, there may be a call for more single-user-focused games.

For the German-speaking users, fun was cited most often as a motivation for playing. Among Chinese-speaking users, however, interacting with other players and designing avatars individually were deemed important. Regarding interacting with others, for the German users an important feature of MMORPGs seems to be building up communities ('guild' within the MMORPG). The Chinese users, especially those posting about Perfect World, mentioned meeting like-minded people, helping other players, being part of a community with friends and colleagues, and even flirting and finding a husband or wife. Perfect World allows virtual kissing and hugging, which illustrates how the technical features of a game can have an important impact on users' motivation to play. For instance, (Chinese) users reported that playing MMORPGs offered topics of conversation for married couples. Thus, virtual communities are translated into the physical world and vice

versa. In Perfect World, getting married is part of the game and is a clear attraction for users. This difference between the German- and Chinese-speaking users can be explained by cultural dynamics; while in the German-speaking world collaborating and having a good work ethic is valued, in China online dating has become increasingly popular.

3.4 Qualitative Findings that Support International Business Decisions

The analysis of qualitative data extracted from online communities reveals a number of potentially useful insights that can help support international business decisions. First, the computer-mediated information exchange between users of MMORPGs indeed offers insights about products and services that can be used for product enhancement and modification. As outlined in the motivation and critiques section, a number of different motivations to play online were identified which, when split along German and Chinese language-groups, reveals focal points that the firms need to address in making product/feature improvements for specific markets. For instance, in a Chinese setting, appealing graphical design as well as novel ways of interacting with other (virtual or real) people is important. In a German-speaking context, collaborative options and challenging new tasks are key to keep customers happy.

Second, firms can obtain value from the qualitative analysis of the communities when focusing on firm-related aspects. Users offered ample of information about features of the game, which can be considered absolute necessity for entertainment and enjoyment, while offering firms the opportunity to make business-model decisions in terms of pricing and functional/graphical aspects of the MMORPG virtual environment. As far as hardware related graphical issues are concerned, the information from the online community allows for market-selection and market-expansion related decisions, as different hardware requirements in the cross-country setting suggest different segmentation and targeting propositions.

4 Conclusion

Online communities and networks are a fascinating phenomenon that makes firms, as loci of innovation, more porous and indeed more decentralized (Hof 2005). Although it has been suggested that this collective power is shaking up the status quo in many industries, IB is challenged to explain the community phenomenon and its implications. In this paper, we examine how the extension of the innovation perspective beyond firm boundaries, towards the network level, can help us to understand firms' approaches to innovation generation and their attempts to draw on external resources (Lew and Sinkovics 2012).

We explore the idea that value can be created through capturing and commercializing information resources that are available online, at the network level, in communities. Online communities, in this study, consist of users' opinions on product and service-related issues surrounding MMORPGs. The information is organized in threads and can be accessed and processed by other users as well as by companies without any direct interaction with the users. The advantage of accessing this kind of information is that it is created in a familiar environment that results in natural groups being formed. This makes it representative of the various segments' opinions.

In addition to posts by forum members, forum administrators allow non-members to post questions so that forums can be used to investigate specific questions game developers may have or to test product ideas, for example.

In the online community forums that we analyzed, the users provided direct feedback to the developers, suggesting what the game should do, or reacting to changes/improvements from previous versions. Thus, users provide direct feedback, but they also make indirect contributions, in that they report on their behaviors, emotions and opinions. For instance, one user reports that s/he was happy that his/her account for WoW had expired because the game had become boring. Hence, the use of online community discussions, and the analysis of user reactions to new ideas, etc., can be directly accessed and used as part of the IB decision-making process.

However, online communities lack clear organization, and this will become more important as they grow. If companies want to use the content provided by online communities, they need to find a way to extract the relevant information. Forum threads and content are not always linked and the challenge of identifying fruitful discussion threads and user contributions could make it difficult to conduct useful analysis on specific topics.

The analysis of online communities offers fascinating avenues for future research. Firms may consider collecting specific information about products and services that are under development and testing them by offering advance access to specific community user groups. In the MMORPG online community context, for instance, a key question may be the appeal of item-based versus subscription-based business models in new markets, such as Central and Eastern Europe (CEE).

One means of reaching online communities and their members is voice over IP (VoIP) software, such as Ventrilo or Teamspeak, and another is videoconferencing tools such as Skype. These offer verbal means of communication and are suitable for conducting online focus group discussions. MMORPG players already use Ventrilo and Teamspeak to communicate. The main advantage of using VoIP software is that primary data may be collected in a direct contact situation, via an online situation that people are already used to. However, contrary to existing online communities in forums, online focus group discussions seem to be difficult to set up due to the ethical and legal sensitivity of the topics and the impersonality and low trustworthiness of "virtual contact persons" from the players' side.

From a theoretical perspective, online communities offer an opportunity to study network-level innovation and extend the thinking of IB theory outside the

firm as the central unit of analysis. Using this perspective, the notion of resource externalization (Lew and Sinkovics 2012) can be applied to understand new practices of innovation in IB.

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Part IV.2
Emerging Issues, Trends and Opportunities: Other Emerging Issues and Trends

Ethics in e-Business: Emerging Issues and Enduring Themes

Daniel E. Palmer and Mary Lyn Stoll

Abstract e-business is a central element of the contemporary marketplace and models of e-business continue to evolve. While various forms of e-business offer unique opportunities for businesses to reach consumers, such practices can also raise issues of an ethical nature. In this chapter we examine and illustrate some of the ethical implications of the transformative nature of e-business. By framing these issues within the context of a general account of business ethics we show how the ethical issues involved in e-business are both related to traditional issues in business ethics and unique in their own right. In doing so, we examine several ways in which the technologies involved in e-business have intensified ethical concerns about privacy, security, and other social norms in business. A number of examples and cases are used to illustrate these ethical concerns as well. In addition to providing a theoretical framework to approach these ethical issues, we also offer some practical guidance as to how businesses can implement and maintain appropriate ethical standards to govern their e-business activities.

Keywords Stakeholders · Privacy · Anonymity · Data-mining · Security · Biometrics

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1 Introduction

e-business represents an important element of contemporary business and it is an element that continues to thrive and expand as a marketplace force. For instance, a recent U.S. Census Bureau report (2010) indicates that "U.S. retail e-commerce sales reached $169 billion in 2010" and the same report also notes that "from 2002 to 2010, retail e-sales increased at an average annual growth rate of 17.9 %, compared with 2.6 % for total retail sales (p. 3)." While retail e-commerce is only one form of e-business and the figures cited only concern sales in the United States, e-business is having similar effects in other areas of business and in other regions of the world. e-business is now a central element of many business models and its global economic impact is significant.

The influence of e-business has not been merely economic though, as the technologies and practices involved in e-business have personal and social consequences as well. For example, in recent years Internet giants Facebook and Google have both faced intense public scrutiny concerning their default privacy settings. Although the data driven business practices utilized by these companies are potentially very profitable, they also raise questions about the nature of individual privacy and social norms on the web.

Thus, while the data from the U.S. Census Bureau illustrates the increasing importance of e-business within the business world, the backlash over privacy settings illustrates the sort of correlated issues of ethical value that can arise in relation to various aspects of e-business. The ethics of e-business involves an examination of precisely these kinds of value issues concerning the potential ways in which e-business can affect both individuals and society. Given the increasing expansion and influence of e-business in the world of commerce, exploring the ethics of e-business becomes a particularly important task. If the ethical issues related to e-business are left unexamined, the potential for ethical problems will only grow along with the advance of e-business. The goal of the ethics of e-business is thus to both examine these ethical issues and to provide guidance on how to develop e-business in ethically acceptable ways.

In order to properly examine such issues and develop ethical guidelines for e-business, the remainder of this chapter will proceed as follows. In Sect. 2 we examine the general features of e-business, with an eye toward understanding the underlying technologies and models of e-business. In Sect. 3 we provide an overview of the main concepts of business ethics so that we are in a better position to frame and explicate the ethical issues associated with e-business. Turning then specifically to the ethical issues of e-business, in Sect. 4 we provide an account of main distinctive aspects of e-business that have ethical significance. In Sect. 5, we provide analysis of some of the particular ethical issues involved in e-business as well as look at specific examples involving these issues. Finally, in Sect. 6 we provide some practical guidelines for businesses to utilize in developing ethically sound standards for their e-business practices.

2 The Basics of e-Business

In the broadest sense, e-business refers to any aspect of business that includes an electronic component. However, e-business is more commonly defined in terms of the electronic communications aspect involved in various business transactions, particularly those based in Internet technologies. For instance, Hsu et al. (2006) define e-business as "the use of Internet-based computing and communications to execute both front-end and back-end business processes" (p. 9). e-business is often strongly associated with e-commerce, and more particularly with retail e-commerce, in the minds of the general public. This identification is not surprising, given the prevalence of web shopping among contemporary consumers and the huge exposure of e-retailers like Amazon.com or online auction sites such as eBay. However, it is important to bear in mind that e-business encompasses much more than just e-commerce. e-business can be involved in nearly any aspect of business from human resources to supply chain management. e-business can also be integrated into different business models and incorporate different types of transactions (Emens 2010).

Whatever the particular forms and models of e-business, it is clear that not only is e-business continuing to expand and become more sophisticated, but that it represents a transformational force as well. By transformative, we mean that e-business forms and models have the potential to significantly reconfigure the manner in which individuals and companies interact as well as the general conditions in which such interactions take place. As Susan Emens (2010) notes, e-business represents a paradigm shift within business. The new paradigm of e-business, and the technology involved in bringing about that paradigm shift, is considerably altering the way in which business is done. In the process, our previous expectations and ideas concerning the norms of business are being challenged. As we will see shortly, it is precisely because of its transformative nature that many of the most pressing ethical questions within the world of e-business arise.

3 The Nature of Business Ethics

As a branch of applied ethics, business ethics seeks to apply ethical principles and concepts to the evaluation of business activities. This endeavor can be construed as having both a theoretical and a practical aspect. At the theoretical level, the goal of business ethics is to identify ethical issues inherent in, or resulting from, various business practices or activities and to provide reasoned analysis of them. Ideally, a complete theory of business ethics would provide a comprehensive account of what is morally permissible, impermissible and required within the world of business. At the practical level, the aim of business ethics is to provide persons involved in business with the tools to effectively identify and respond to ethical issues. The practical aim is to provide business persons with the ethical tools to

avoid unethical forms of business activity and to pursue ethically appropriate ones. Practical strategies for addressing ethical issues in business can be directed at various aspects of business activity, such as marketing, finance, human resources, accounting and so forth. Business ethicists can also attempt to address ethical concerns at different levels of analysis by looking at the social and legal environment of business, the organizational structure of businesses, or the individual level of managers.

As a field of study, business ethics is now a firmly established academic discipline and the importance of business ethics is widely recognized by business organizations and industries as well. The tired old saw that "business ethics is an oxymoron" has largely been laid to rest and been replaced by a general consensus among both academics and business persons that ethics has an important place within business. At the practical level the attention to business ethics is attested to by the large numbers of businesses that have crafted ethical codes of conduct, appointed ethical officers and instituted various forms of ethics training. Most industry and professional groups have also adopted codes of ethics for their own members. At the academic level, there is a large number of journals, book series, centers, and conferences devoted to business ethics.

There are numerous reasons underlying the increasing attention given to business ethics in recent years, but we will note two that are of particular significance. At the practical level, recent decades have witnessed a number of widely publicized business scandals that have caught the public's attention. The concerns over the harms brought about in these cases have led to subsequent calls for more ethical behavior on the part of business. Examples of these kinds of renowned cases include financial scandals such as the collapse of Enron or the Bernie Madoff debacle, product safety cases such as those involved with the Ford Pinto or Firestone tires, and environmental disasters such as the Bhopal gas leak or the Exxon Valdez or BP oil spills. Cases such as these have made the public readily aware of the very real costs of ignoring ethical issues in business. Indeed, the recent worldwide financial meltdown, with its grave and ongoing repercussions, arguably represents another case that illustrates the significant consequences to the public good of ethically questionable business activity and the need for businesses to better attend to ethical questions.

While such cases illustrate the human costs of ethical failures in business and provide a clear indication of the need for business ethics at the practical level, at the theoretical level considerations about the foundations of business have also buoyed the consideration given to business ethics by academics. As many business ethicists have argued, business activity does not occur in a vacuum, but represents a complex form of human interaction in which individuals pursue their personal goods within a social framework. Ultimately, the value of business is subservient to the achievements of these goods, individually and in common, and business activities that do not contribute to human flourishing in some manner cannot be justified (Solomon 1992).

This leads to two theoretical considerations supporting the need for and legitimacy of business ethics. For one, since business activities take place interpersonally, they presuppose at least certain conditions of trust and honesty for their efficacy. While business is necessarily competitive at some level, that competition presupposes certain conditions of fairness and trust. Even Milton Friedman (1997), while denouncing a broader view of social responsibility in business, recognized that for the market to work properly businesses must avoid deceptive and fraudulent practices and recognize general moral norms. Second, the considerations above point to the fact that in so far as business activities do not occur in a vacuum, they have the potential to significantly affect the wellbeing of those involved as well as others in ways that are not directly intended. Just one example of this sort of phenomenon would include the various externalities of business activities, such as pollution. As such, it is reasonable to scrutinize business no less than any other form of human activity in regards to the balance of goods it may bring about in a society. Business ethics, at a theoretical level, is necessary precisely because business activity can affect the well-being of not only those engaged directly in particular business transactions, but also human welfare writ large.

While there is now a clear and overwhelming consensus as to the need, theoretically and practically, for business ethics, there is less consensus as to the correct approach to doing business ethics or to the particular ethical positions taken on various specific ethical issues found within business. In this brief review, we could not hope to address all of the debates and differences within business ethics as a discipline. Rather, our aim in the remainder of this section will be to indicate some methodological and conceptual considerations that have a bearing upon our own approach to ethical issues in e-business. The approach we take toward the ethics of e-business will be further illustrated later when we address some specific ethical cases in e-business.

One important feature of our own view of business ethics relies on acknowledging the fact that that while differences may exist in responses to business ethics issues, approaching ethical issues in business nearly always involves appealing to some general principles that are at least prima facie plausible given the role that they play in other areas of our moral reasoning. Our treatment of issues in applied ethics must begin, at least provisionally, by appealing to generally held moral principles or widely held moral convictions. These principles and judgments may themselves come from a number of different sources, including common moral beliefs, abstractions from previous cases, or even moral theories, but they provide a starting point to analyze ethical issues in business.

In this respect, the approach we adhere to in business ethics is very influenced by the more general view taken toward ethical issues in *A Theory of Justice* by John Rawls. Rawls (1971) argued for a position known as reflective equilibrium, whereby there is a general back and forth between moral principles and specific cases in the execution of our moral reasoning. We use general principles as a means of examining particular cases, but those principles themselves may need to be modified or re-examined in light of our particular judgments about individual cases.

What is important about Rawls' view of reflective equilibrium, for our purposes, is that it acknowledges the importance of appealing to ethical principles in moral reasoning, but in a way that does not presuppose that those principles are themselves so absolute as to prevent revision of them in light of our ongoing efforts to achieve normative consistency in our treatment of various ethical issues. As with Rawls' more general view, we see applied ethics as involving an ongoing refinement of general principles in light of specific cases in an attempt to reach reflective equilibrium in our moral thinking. Such an approach to business ethics has significant advantages since it both allows one to appeal to generally shared moral principles while recognizing that the principles themselves may need to be modified in light of our treatment of new cases and issues.

A second feature of our approach to business ethics involves, as at least a heuristic tool, using a stakeholder approach to identifying and analyzing issues in business ethics. While we recognize the difficulties that remain in providing a complete theoretical foundation for stakeholder theory, we maintain nonetheless that stakeholder theory represents a powerful tool for approaching ethical issues in business. At heart, the two-part stakeholder approach we defend and adopt makes use of the notion originally offered by Edward Freeman (1984) that any party who has the potential to be significantly affected by business activity has a right to stakeholder consideration. As we argue elsewhere (Zakhem et al. 2008), stakeholder identification involves determining what parties have a legitimate claim to stakeholder consideration, while stakeholder analysis involves weighting the various stakeholder claims in order to arrive at a morally appropriate response to the particular situation under consideration.

Finally, we would note that the approach to business ethics that we adopt recognizes that business ethics is inherently interdisciplinary in nature. As a form of inquiry, business ethics both involves multiple layers of analysis (social and legal, organizational, individual and environmental) and appeals to a number of disciplinary tools. Many factors, social, psychological, legal, economic and so forth, bear upon our understanding of how ethical issues arise in business and how we can best respond to these issues. Likewise, promoting ethical businesses practices necessitates addressing a wide range of motivational, cultural, legal, technological and social conditions. It is important, for these reasons, for business ethicists to make use of the full range of tools available in analyzing ethical issues in business.

3.1 Business Ethics and e-Business

Having expounded upon the nature of business ethics in general, we can now move to a consideration of the ethics of e-business. In doing so, we might first consider a very general issue. On the one hand, we might wonder if there is really any need for a distinct ethics of e-business. After all, ethical issues in all of the functional areas of business (marketing, human resources, finance, and so forth) have already been widely discussed and debated in the literature of business ethics. If we were

to view e-business as a simple technological extension of business as usual, we then might be inclined to see the treatment of issues in e-business as a just a simple application of the ethical treatment of the same issues in other forms of business. Under this view, there would not be anything particularly significant about ethical issues in e-business as such.

On the other hand, we might adopt the view that e-business is so distinct from other forms of business as to require a completely new ethics all together. After all, the forms of technology and means of interaction involved in e-business involve a significant divergence from what was previously available within business. For instance, one might argue in this vein that social networks provide for means and models of business that are radically different than anything previously involved in business. One might then wonder whether ethical concepts and principles developed in relation to other forms of business practice might be applicable to the new world of e-business at all. Such a view is reflected, for instance, in the remarks by the founder of Facebook, Mark Zuckerberg, that privacy is no longer relevant in the age of the Internet. Whether we agree with this particular assessment or not, it does illustrate well how paradigm shifts in business and technology can force us to rethink the application of our moral concepts.

The dilemma, we believe, is overstated, but stating it explicitly in this manner does illustrate a potential divide that we should be aware of when dealing with ethical issues in e-business. In many ways, this divide mirrors a parallel debate in computer and information ethics concerning the uniqueness of ethical issues in computing (Johnson 2001).

We believe that the proper view concerning the uniqueness of the ethics of e-business falls somewhere between these two positions. Here we maintain that the reflective equilibrium approach to applied ethics that we outlined above is particularly well suited to investigating what we call the transformative nature of e-business. On the one hand, we will maintain that the same ethical principles and concepts that are relevant to other areas of business ethics are equally relevant to ethical issues in e-business. We always have to begin our ethical analysis from somewhere, and our general concepts and well-reasoned judgments concerning ethical issues in other areas of business represent the necessary starting point for approaching ethical issues in e-business. e-business, as we will shortly show, raises new issues for ethical consideration, but our analysis and response to those issues must begin with the ethical tool kit that we have on hand. Many of the particular ethical issues involved in e-business involve cases in which the question involved is precisely how to understand the relevance and application of our previous moral concepts and judgments in a significantly new technological and social environment.

On the other hand, in significantly transforming various business practices and giving rise to new situations that were not possible in relation to previous forms of business, addressing ethical issues in e-business does require that we rethink the application of those principles in new situations. It also gives rise to the possibility that we might even need to revise our understanding of the nature of those principles themselves, or at least clarify their content, when faced with radical changes, technological and otherwise, within the world of e-business.

4 Analyzing the Transformative Nature of e-Business

The notion of the transformative nature of e-business refers to the manner in which the methods and models of e-business are transforming business practices. Such transformations engender the need for careful ethical analysis precisely because they involve innovations that have the ability to both intensify existing ethical concerns as well as raise new ones. Our analysis and response to such issues should be grounded within the framework of business ethics already established, but open to the need to reexamine and revise our ethical views in light of the transformative world of e-business. Below, we explicate some of the main features of the transformative nature of e-business, provide examples of the impact of these transformations, and explicate their ethical significance as well.

4.1 The Scope and Pace of e-Business

One of the most obvious ways in which e-business is transforming business is that the forms of information technology involved in e-business are allowing businesses to act at unprecedented speeds and with a much greater range of parties. Internet platforms and mobile networks allow nearly any business to communicate with consumers, suppliers, employees and other suppliers, employees and other stakeholders easily no matter where they are physically located. In many respects, globalization as we know it would be impossible without the technologies of e-business, since global markets depend upon the seamless information transfers and sophisticated network communications made possible in and through e-business. In turn, we can say that e-business has made all business potentially global in scope, as markets across the globe are easily accessible to even the smallest retailers in the world of e-business.

In this sense, e-business is opening up the world of business more than ever, providing the means for all business to widely engage in competitive marketplaces. The benefits of such access are readily apparent, but the intensified pace and scope of e-business raises ethical issues as well. For one, the global nature of markets created by e-business typically transcends local and national boundaries and thus present difficulties in regulating business practices or maintaining conditions of fairness. We can see one example of the kind of ethical issue this raises in considering the situation that many brick and mortar companies in the United States now face when competing with Internet retailers. Such companies complain that they are put at an unfair disadvantage since Internet retailers are not typically required to collect taxes on purchases originating from out of state. Thus, a consumer who orders an item from out of state can typically avoid the sales tax that they would have paid had they purchased the item in-state from a retailer with a physical location. This, brick and mortar retailers argue, puts them at an unfair competitive disadvantage. On-line retailers, for their part, argue that the burden of

collecting and remitting numerous different state taxes would be excessive, leaving the question as to how to fairly monitor tax collection in the Internet age an open question.

A second ethical case that illustrates how the accelerated pace and scope of e-business can raise questions of fairness can be found in the world of high frequency stock trading. Indeed, in this case some commentators have argued that that this form of e-business is fundamentally transforming the underlying mechanisms that typically were seen as essential to the stock market. In high frequency trading powerful computing technologies are used to trades stocks at very quick speeds and such stocks are bought and sold in very short periods of times (sometimes being held for only seconds). Ordinary individuals who lack access to the computing power used by high frequency traders are arguably put at a huge disadvantage in buying and selling stocks when faced with such competition. It has even been suggested by some that high frequency trading undermines markets all together, since stock prices are manipulated in ways that reflect no real valuation of the companies that they represent.

4.2 The Depth of Access Possible Within e-Business

While e-business has greatly expanded the reach (in time and space) of businesses, it has radically transformed the depth of access potentially available to businesses as well. In this regard, we would argue that in the age of e-business nearly all business is becoming intensely data driven in a way that was not possible prior to the existence of e-business technologies. Electronic data collection and analysis allows companies to target consumers and craft products and services with an ever increasing precision. The growth of social and mobile business platforms are part and parcel of the new data driven forms of e-business that relentlessly collect data, track consumers, and precisely hone marketing efforts. Ironically perhaps, conjoined with the increased global reach of e-business there is also a corresponding focus upon the particularities of individuals as well. In the world of e-commerce data is king, and the recent initial public offering of Facebook illustrates the extent to which businesses are banking on the potential of social networking technologies to provide them with ever better means of collecting and tracking user data.

Again, there are clearly benefits to this new model of e-business, as it allows companies to produce products and services better tailored to consumer needs and to market such products and services to consumers most likely to want them. Once again though, this aspect of e-business raises a number of ethical concerns. Primary among these are concerns about privacy and security. Many individuals view the constant tracking of online behavior and other forms of data collection as potentially involving serious violations of privacy rights. Recently, this type of issue has arisen again as regulators, advertisers, and privacy advocates debate the standards that should be put in place for ‘do not track’ settings on search engines.

Coupled with these privacy concerns are security concerns as well, since as companies collect more and more data, the risk of such data being leaked to third parties that could potentially misuse it becomes greater as well. Numerous examples of data theft, data leaks, and data misuse by companies illustrate this problem. Responding to such security problems can be costly both to companies and affected individuals, and ethical expectations concerning data security is an ongoing ethical concern in the field. Indeed, these issues of privacy and security are so central to many discussions of the ethics of e-business that we will examine some of them in the next section where we look at examples of specific issues in e-business more closely.

If the depth of access provided by e-business presents ethical challenges from the point of view of consumers, it does so from the point of view of businesses as well. One of these issues involves the ease with which Internet and associated electronic technologies make it possible for people to reproduce and distribute the copyrighted content of other businesses. Ever since Napster several industries, including most prominently the music and film industries, have been deeply concerned with how to properly protect copyrighted materials in the age of the Internet. While many users view trading music, movies and other files over Internet protocols to be just part of the freedom of the Internet age, many companies view these practices as morally problematic and deeply threatening to their ability to sustain their businesses. Of course, the issue of the scope of e-business makes the issue doubly difficult, as the file sharing platforms that people use to engage in such activities easily transcend national boarders, making their regulation particularly difficult.

4.3 The Potential Anonymity of e-Business

What some have termed the anonymity of the Internet can give rise to ethical issues in e-business as well. One unique feature of e-business, as compared to face-to-face business conducted in physical stores, for example, is that the users involved in e-business transactions can often carry out business in an aura of anonymity. Paradoxically perhaps, as the Internet has broadened the connections possible between people, it has also made us more disconnected from many of those we engage in business with. The anonymity that is possible in the Internet can raise ethical issues in e-business in a number of ways. For instance, it makes it much easier for people to engage in fraudulent or dubious business schemes or marketing techniques, because it is so easy to hide under the veil of Internet anonymity (Terjesen 2010). The most blatant forms of such activity occur in the various phishing and trolling schemes that are ever presently engaged in over the web, but spam marketing and other e-business marketing and selling techniques can raise similar issues in a more nuanced manner.

Perhaps one area where potential problems relating to anonymity have been most fully addressed has been in the world of online auctions. In essence, eBay and

similar online auction venues rely on mechanisms of reputation to prevent fraudulent or unethical behavior among its sellers and buyers (Terjesen 2010). However, such mechanisms are far from perfect, and opportunistic individuals continue to attempt to engage in deceptive exchanges under the veil of anonymity. The extent to which responsibility for preventing and responding to such abuses belongs to consumers, businesses, or the government thus remains an ongoing ethical issue in e-business.

The three transformative aspects of e-business that we have dealt with in this section, and the particular examples that we associated with them, are certainly not the only ones that could be discussed in a treatment of the ethics of e-business. But they do illustrate well the way in which changes in a particular form and means of business, such as e-business, can alter practices, expectations, and behavior in such a way as to engender ethical questions and problems. Explicating such general conditions in turn better allows us to identify specific ethical issues and apply ethical concepts and analysis in responding to them. In the next section, we turn from such general considerations to a more specific treatment of some key ethical issues in e-business to illustrate concrete cases of the ethics of e-business in more depth.

5 Analyzing Specific Issues in e-Business

In previous sections we both provided a very general framework for approaching issues in applied ethics and examined some of the transformative aspects of e-business that give rise to unique ethical issues. In this section we move beyond such general considerations and provide an explication and response to particular ethical issues in e-business. In doing so, we address two areas of e-business that we believe are of central importance to the ethics of e-business. In each case, we illustrate the nature of the ethical issue through concrete examples, provide an analysis of the ethical issues involved by examining how certain fundamental ethical concepts apply in each case, and offer an argument as to how best to respond to the ethical issues uncovered.

5.1 Security Concerns

While security is important in all areas of business, security issues in e-business give rise to unique areas of moral concern. The speed at which breaches can occur and the vast potential for harm that can come with a breach make these issues particularly important. Many companies have been lax in their attention to Internet security and the cost of investing in cyber security also presents a motivational barrier. In this section we examine several cases of cyber security breaches in order to highlight the main areas of ethical concern.

5.1.1 Global Bank Theft

A report from two United States security firms released in 2012 noted that a wave of cyber-attacks across the United States and Europe had resulted in bank losses of at least eighty million dollars. In the United States the targets were business accounts with balances of at least a million dollars. The victims were targeted by online reconnaissance and phishing techniques used to gather account information and login passwords. The attacks targeted a range of financial institutions ranging from credit unions to large global banks (AFP 2012). Cyber criminals used programs called SpyEye and Zeus to transfer money automatically. These programs can be installed on computers that visit malicious websites as well as on legitimate websites that have been compromised (Menn 2012).

On the one hand, bank theft is certainly not a new problem. On the other hand, its cyber theft version presents unique challenges. For one thing, much greater amounts of money can be garnered through targeting banks in cyber space as compared to traditional bank robberies (Bennett 2012). The digital nature of the crime and the use of computer programs to 'carry out' the thefts enables thieves to act with much greater anonymity and it makes catching them much more difficult. Moreover, security concerns cannot be addressed through traditional means (such as the use of cameras or dye packs). The entryways for cybercrimes are as numerous as the websites that bank computers interact with. Further, governments have thus far not required investments in cyber security, nor have they required reporting cyber thefts to the public.

Perhaps even more problematic is the fact that according to at least one FBI cyber security expert, not only do thousands of breaches occur daily, but 94 % of these companies do not know that such breaches have occurred until after the fact (Pitchford 2012). Further complicating the situation is the fact that given the international scope of many of these activities, global cooperation is necessary to identify, track and pursue these thefts. In such a context of nearly ubiquitous threats and challenging technological and legal contexts, it is easy to see why some companies might lack the motivation to put forth more stringent security efforts. Indeed, it might seem easier to just build in the costs of such thefts and pass them on to consumers. However, such laxity is not morally justified, since stakeholders, such as consumers, can be harmed by such practices in a number of ways.

First, consumers ultimately will bear the costs of such thefts and as long as an environment of security laxity is allowed to flourish, those costs are likely to be far greater in the long run than addressing security more directly would be. Second, such breaches often expose consumers to additional, and longer term, vulnerabilities as personal data may be involved as well. Perhaps most importantly though, the environment of laxity that exists when companies ignore security concerns on the Internet potentially undermines the conditions of trust that are necessary for fair and efficient markets. No doubt, addressing security concerns in Internet business is more difficult than doing so in brick and mortar contexts, and it will require efforts that are both industry wide and global, but the risks of not doing so far outweigh these difficulties.

5.1.2 Data Theft and Wyndham Hotels

As already noted, cyber theft can affect not only corporate financial concerns, but involve issues of consumer information as well. Another example of cyber security illustrates this well. Wyndham Worldwide owns the Marriot, Super 8 and Ramada hotel chains. On three different occasions over a two year period, the credit card information of customers of Wyndham hotels was obtained by cyber thieves. According to the Federal Trade Commission (which filed suit against Wyndham Worldwide), the thefts were the result of lax security. Hundreds of thousands of customers had their credit card data breached. Credit card information was subsequently posted on a Russian hackers' website. The FTC claims that there were over ten million dollars in fraud losses as a result. For its part, Wyndham denies knowing of any such losses and defends itself by noting that it informed customers of the breach and offered affected customers credit monitoring services (Wyatt 2012).

Although Wyndham argues that it should not be blamed for any losses because it subsequently informed consumers, it did little to prevent breaches after the first incidents. While a one-time failure might be morally forgivable, this case well illustrates our earlier point about allowing a culture of lax security to exist in e-business. Companies have a strong moral duty not only to provide adequate security for consumer data in the first place, but they have an even stronger duty to react to breaches in ways that respond to security problems that have been identified. Cyber security improvements could have likely prevented recurring thefts of the credit card information (Mills 2012).

Importantly, we would argue (as in the case of the banks), that the thefts undermine consumer trust in ways that are harmful even if the information had not been used by the thieves. Thus, Wyndham's defense is insufficient even if the FTC's claims concerning the amount of losses incurred through the thefts of information are false. Acting in a careless fashion in regards to the confidential information of others does not show respect for consumer stakeholders even if there is no direct monetary loss. Moreover, dismissing concerns about such losses on the grounds that one is 'not aware of them' represents a failure to take consumer concerns seriously. It is interesting to note again the apparent difference in the way that cyber security and physical security are sometimes treated, as companies would be very unlikely not to respond more aggressively to repeated security breaches at their physical locations. However, since the losses are just as real, and potentially harmful, there is no reason for thinking that repeated and persistent cyber-attacks should not be addressed with the same weight and concern as with physical attacks. While the vastness of the Internet may make the effects of those harms more difficult to trace, they are no less real and should be treated with the same diligence and foresight.

5.1.3 Social Network Data Breaches

Often money or credit card accounts are not the direct targets of cyber thieves though, as they often seek other vital information on consumers that can then be used by itself, or in conjunction with other information, to target individuals. Such privacy breaches can be used to steal identities, hack into other accounts, or to foster other forms of fraudulent behavior. In this regard we can consider the case of LinkedIn, a professional social networking site that experienced a security breach that resulted in 1.5 million hashed passwords being posted on a Russian website. Hashed passwords are easier to crack, and the data available on LinkedIn could be used for a variety of nefarious purposes. LinkedIn did alert its consumers so that they could change their passwords, but personal information made available for networking purposes was potentially available to hackers if passwords were not changed in time (Vijayan 2012). Other popular sites, such as EHarmony and lastFM also experienced breaches of password information recently, and up to 8 million passwords were posted on a hackers' forum website (Mills 2012).

What such cases illustrate about the uniqueness of e-business is that forms of data processes involved in e-business pose new risks and potential harms to consumers and businesses. While social networking sites, as with any other business, cannot promise a crime free environment for its consumers, they can and should take greater care to ensure that the security of confidential information is properly protected in these new environments. In the case of LinkedIn, for instance, the company could have used a different and more reliable method of protecting passwords from being so easily cracked (Vijayan 2012).

While consumers have a responsibility to be judicious in controlling their own information, businesses have a responsibility both to make consumers aware of potential security issues and to take steps to properly protect consumers. Indeed, many consumers seem to be unaware, perhaps because of the paradigm shift involved in e-business, of the risks involved in these types of cases, especially since companies are not required to report cyber security breaches. As a whole, many companies may be fostering a false sense of security among their clients and consumers. Even in the online environment of e-business though, stakeholders have a basic right to expect due diligence on the part of businesses they interact with. Security measures should be addressed proactively and consumers should be made aware of potential threats and risks in a more transparent manner. Further, given that potential security threats have even greater implications in an e-environment, business, governments and industry groups have a responsibility to better foster conditions of security in e-business.

5.2 e-Marketing and Privacy Concerns

Privacy concerns, as previously noted, raise some of the most pressing ethical issues in e-business. e-business technologies allow marketers to collect much greater amounts of information about consumers in order to target them more

effectively. Certainly this is a good thing in some respects, since it allows businesses to target ads to more narrowly defined demographics. In doing so, companies can both increase the likelihood that consumers will purchase their products as well as avoid targeting individuals who are not likely to want their services or products. However, data mining and associated technologies involved in these e-business practices can also raise moral issues, particularly in regards to consumer privacy issues, as the next two examples illustrate.

5.2.1 Data Mining and Data Usage

Echometrix is a company that sold software to parents seeking to regulate their children's online activities. However, Echometrix also could sell information on the children's search habits, online chat conversations, and instant messaging to third party marketers, a fact that many parents were not clearly made aware of in their transactions with Echometrix. The FTC eventually filed suit against Echometrix, arguing that parents were not properly informed that marketing data could be collected and sold to third parties. Echometrix eventually settled the suit without admitting wrongdoing. The State of New York also filed a similar suit, which resulted in a fine of one hundred thousand dollars for the company. Subsequently, the data was destroyed. Measures were also put into place to ensure that compliance was maintained with FTC oversight (Federal Trade Commission 2010).

One obvious ethical concern in this case involved the fact that parents were not adequately informed and thus did not give voluntary and informed consent to the data collection. Most likely, many parents did not even consider that the product they purchased could sell third parties information on their children's Internet habits. In this sense, parents certainly likely had an expectation of privacy concerning their children's behavior, and one that seems reasonable despite Mark Zuckerberg's claims about the end of privacy. Particularly in regard to vulnerable populations, such as children, expectations of privacy are still reasonable even if we need to rethink how they apply in the Internet age.

While Echometrix, as is common in these cases, did include some fine print in its user agreement concerning the potential to sell such information, the difficult and unclear nature of that language was such that parents could not be reasonably expected to understand it properly. One problem with many user agreements in the Internet environment is precisely that the consent forms involved are so long and difficult to read that users can almost be expected to simply bypass them and click "I agree". But without full comprehension, users are not really expressing a truly voluntary form of consent. While consumers do have a duty of due diligence to read agreements, the Internet environment often fosters conditions that make real transparency exceedingly difficult. This is particularly problematic, as in the case of Echometrix, where the consent is for children who themselves are not able to give true consent. Again, part of the problem lies in the reliance on a model of consent (based on physical forms) that makes little sense in an online environment. In order to better foster truly informed consent, businesses and regulators need to

foster means of making information transparent to consumer in an Internet environment.

There are issues other than informed consent involved in these cases though. For instance, much of the information gathered and sold is done in a manner that is morally problematic even when the clients are adults. For instance, many companies maintain that the data collected lacks personal identification and thus is morally innocuous since user anonymity is maintained. However, this is not necessarily true. *The New York Times*, for instance, was able to easily determine the identity of a least one user given just her web search histories when AOL released a limited number of search histories with only numeric identification for the purposes of scholarly research (Barbaro and Zeller 2006). Further, even when a consumer willingly relinquishes information that does not mean that privacy concerns cease to be relevant. Here, we can consider the case of Metromail which had prisoners process survey information. As a result, at least one person was stalked by a convicted rapist and burglar who gathered information about his victim because of his work for Metromail in prison (Electronic Privacy Information Center 2012a). While Metromail consumers were informed about the data usage, they were not informed that prisoners were processing the information, a fact that arguably might have changed their decision.

These considerations should lead us to consider why privacy is important to individuals in the first place. On the one hand, privacy is important simply because we want to maintain control over how others have access to us, particularly when such access leaves us vulnerable to others. Certainly, privacy in this regard gives us a means of ensuring our security, including not only physical and financial security, but our emotional security as well. We also value privacy because having control over how information about ourselves is revealed to others allows us to develop as autonomous individuals. Privacy gives us certain realm of creativity and freedom in which to develop our own character without being subject to constant scrutiny. It also allows us to set the terms of our engagement with others, which is an important part of our autonomy. Having privacy is thus essential to developing our sense of self and the conditions for fully autonomous decision making. In so far as we feel we do not have control over how and when others have access to us, our ability to be truly autonomous can be undermined.

Data mining can be used to target individuals in ways that undermine a person's autonomy in other ways as well. Here, we can consider the case of Cate Reid, a student profile in a *Wall Street Journal* article. Reid had done a few web searches on weight loss. Subsequently, ads for weight loss products followed her around the web. Marketers knew that she was unsecure about her weight and used that insecurity to their advantage in targeting her (Angwin 2010). Given the manner in which women are already subjected to unrealistic expectations concerning their physical features, such targeting plays into gender stereotypes that can inhibit women from developing a fully autonomous sense of self. While stereotyping in advertising is not a new problem, the ability to reinforce the internalization of such morally problematic stereotypes is amplified by electronic tracking techniques (Angwin 2010). Businesses, we would argue, have a basic obligation to respect the

autonomy of their stakeholders, since the typical justifications for markets presuppose that the individuals who engage in markets act autonomously. Thus, once again e-business technologies raise issues that have serious ethical implications and which we would argue require careful consideration.

5.2.2 Facebook and Biometrics

Another important aspect of these issues can be seen in the fact that many companies require opt out rather than opt in consent in regards to data gathering techniques, and further confuse the issue by frequently changing their privacy policies. Consumers are thus often unaware of just how much information about themselves they are giving up in order to engage in Internet activities. Facebook, for instance, has a long track record of changing privacy policies in ways that give users little time to understand and adapt to the changes. Most recently, Facebook has added biometric facial recognition software that can be used to search and identify pictures from many different web sources. The use of this software can give rise to problems. Say for instance an individual, call her Alice, posts no pictures of herself on her Facebook page out of concern that a violent ex-boyfriend might use the images to locate her. Nonetheless, if other pictures of Alice are available on old posts or are on the pages of her friends and family, Facebook's facial recognition software could discover and match pictures of her and tag them for users. If Alice does not take the time to opt out of being tagged, Facebook could conceivably find and tag pictures of her from all sorts of sources (Electronic Privacy Information Center 2012b). For instance, a picture she was included in at a local restaurant might be identified and provided to her ex-boyfriend, who could potentially use that information to stalk or otherwise harm her.

It is important to bear in mind that individuals like our hypothetical Alice may have no idea that a picture of her has even been posted online. She may even be unaware that she needs to opt of the service. As such, it is hard to make a case that she has voluntarily consented to this activity, which represents not only a privacy threat, but a security threat as well. Further, even when users do opt out, they only opt out of the tagging function, not of Facebook's collection of their biometric data. Facebook's 2012 acquisition of Face.com which provides the facial recognition software suggests that Facebook will continue to use this feature, perhaps even with an eye toward tracking the consumer brands that consumers are pictured with as well (Murphy 2012). The FTC did charge Facebook with deceptive trade practices due to the lack of adequate information concerning the need to opt of the tagging feature, and Facebook settled the case. However, it can be argued that Facebook has displayed a pattern of similar abuses in its privacy practices. For instance, in 2007, Facebook's Beacon program disclosed users' video rental histories without their knowledge or consent (Electronic Privacy Information Center 2012b).

Even in cases where consumer consent is more clear (by opting-in for example), many users may be insufficiently well informed about the sheer breadth of

information about themselves that is made available and the uses to which it is put. While someone might not care that the others are able to discover that their favorite movie is *Star Wars*, they might be more unsettled by the way in which that information can be combined with other information about them to provide marketers with a very substantial picture of their behavior. Further, it is extremely common for employers to now view potential employees' social networking sites as part of the hiring process. Other institutions and organizations, including even some educational ones, examine the postings of their stakeholders on social networking sites as well. While many people use only the weakest (which are often the default) settings for privacy, they often fail to understand the extent to which this information becomes usable by others and the ramifications of putting it out there. Adequately addressing all stakeholder concerns regarding privacy will thus entail taking account of the enhanced nature of the techniques used to gather and collate information on the Internet, the reasonable expectations of users in regards to privacy, as well as the unique kinds of harms that can be brought about through violations of privacy in e-business.

6 Developing Ethical Standards for e-Business: Practical Implications and Guidance

Businesses committed to ethics and integrity are above all concerned with finding ways to implement ethically appropriate standards and practices as part of their business activity. As we believe that businesses should be committed to high ethical standards, and ought to be held account for ethical failures as well, it is only appropriate that we end this chapter with some advice as to how businesses might best adopt ethically acceptable e-business practices given the rest of our discussion in this chapter. At the practical level, it is crucial that businesses see the implications of the ethical issues discussed in this chapter and incorporate ethical standards into their e-business models. In order to aid in this endeavor, we thus offer some guidelines for companies engaged in developing ethical standards for e-business. While certainly not exhaustive, these guidelines do provide a baseline of standards for corporations to use in developing and maintaining sound ethical e-business practices.

First, and perhaps most important given the sorts of ethical issues that we have described above, we would maintain that all companies should have an explicit commitment to ethical practices in e-business. Such a commitment should be embodied in company codes of ethics, be part of the training of all employees and be consistently and routinely reviewed and reaffirmed. This commitment should focus on the major ethical issues involved in e-business that were discussed in this chapter. For instance, issues of privacy concerns and data security in e-business should be clearly addressed at all organizational levels. At a minimum, this commitment should involve making sure that company e-business practices are in

compliance with relevant legal requirements concerning privacy and data security within the jurisdictions in which they operate, particularly in regard to vulnerable populations, such as children. In the United States, for instance, companies should make sure they are in compliance with the Children's Online Privacy Protection Act (COPPA). Likewise, when dealing with intellectual property, companies in the United States should be careful to abide by the restrictions of the Digital Millennium Copyright Act. While voluntary in the United States, companies with operations in Europe, where privacy laws are stronger, can meet the requirements of the European Union's Data Protection Directive by complying with the International Safe Harbor Privacy Principles created by the United States Department of Commerce.

As the last point indicated, companies truly concerned with ethics in e-business should move beyond seeking mere legal compliance in their efforts, particularly given the shifting nature of legal requirements in the global context of e-business. Rather, companies should seek to install within their organizations a genuine appreciation of the importance of privacy for consumers, a strong commitment to data security, and an assurance of trust and transparency in all consumer relations. We would encourage all larger companies to have an ethical and legal compliance office (and would recommend that these individuals be involved in professional associations such as the *Ethics & Compliance Officer Association* (ECOA)). This compliance office should be responsible for making sure that all legal requirements are being met and that sound ethical principles are implemented throughout the organization. Such offices should also perform scheduled audits to make certain that all benchmarks are being met. While smaller businesses are unlikely to be able to support distinct personal devoted to ethics and compliance we would nonetheless suggest that they assign some individual or individuals to keep current with compliance issues and to address potential ethical problems. Such individuals should be responsible for training, tracking, and reporting on legal and ethical issues. Above all these compliance efforts should make sure that basic legal and ethical requirements are understood by all employees, that best industry standards are adopted for e-business practices, and that potential problems are identified and corrected in a timely fashion. We would also encourage every company to have an explicit code of ethics that deals with, among other things, ethical issues in e-business and to integrate that code of ethics in an effective manner into organizational operations. Indeed, Frisque and Kolb (2005) point out that organizations can use codes of ethics as significant training tools in developing an appreciation for workplace ethics. Above all, the point of all of these efforts should be to produce an organizational culture in which ethical issues are integrated into every level of decision making. As pointed out in the recent report "The Importance of Ethical Culture: Increasing Trust and Driving Down Risks" produced by the Ethics Resource Center, companies that establish strong ethical values throughout their organization are much less likely to experience individual misconduct and, in doing so, generate stronger business value as well (2010).

In addition to traditional compliance efforts though, we would also recommend that companies provide strong ethical guidance for individuals who are most

directly involved in aspects of e-business likely to raise ethical concerns. For instance, any employees who have access to private information about customers, suppliers or other stakeholders should be carefully screened and provided with rigorous guidelines as to the proper use of that information. Those who are involved with the development of e-business technologies, such as programmers, software developers and computer engineers, should be strongly encouraged to follow acceptable ethical guidelines as promoted in professional organizations. In particular, we recommend that all such professionals be familiar with the "Software Engineering Code of Ethics and Professional Practice" endorsed by the Institute for Electrical and Electronic Engineers- Computer Society and the Association for Computing Machinery. In addressing the ethical expectations of individuals within companies, it is important that companies create organizational expectations concerning ethical behavior as well. Here, we recommend that organizations promote what one of the authors of this chapter has elsewhere termed "ethical-organizational integrity" in a manner that is systematic and measurable (Palmer and Zakhem 2012). There are currently numerous resources available to organizations that can aid in the development of a culture of ethics and integrity, but what is key to all successful ethics programs is that the program is fully supported at the highest levels and that the corporate commitment to ethics and integrity be integrated throughout the organization. As Valentine and Fleischman have shown in through sampling a significant number of business organizations, "businesspersons employed in organizations that have formalized ethics training programs have more positive perceptions of their companies' ethical context than do individuals employed in organizations that do not (2004, p. 381)." In addition to providing training, guidance, and organizational support, such programs should also provide employees with a means of addressing ethical concerns within their companies in a non-confrontational manner. Further, organizations should encourage general discussion about ethical issues and the ethical implications of various e-business practices on an ongoing basis in order to identify emerging ethical issues and to sustain the commitment to values within an organization.

We also believe that a commitment to transparency in consumer relations is particularly important given the kinds of ethical issues that we discussed with e-business practices in this chapter. The scope, depth and potential anonymity of e-business technologies make it particularly challenging for individuals involved in e-business both to be aware of and to respond to potential ethical problems. As we have seen in our discussion above, many of the technologies involved in e-business make it difficult for consumers to fully understand the nature of the transactions they enter into and the ramifications of those interactions. For instance, we have seen that consumers often fail to understand the scope of information that they are giving companies access to or the extent to which that information might be used or sold to third parties. Likewise, consumers often lack the ability to determine the nature and strength of the data security provide by companies. While consumers certainly have a responsibility of due diligence, companies that are committed to ethical behavior should also realize the difficulties that consumer often face when

confronted with bewildering legal statements or complex disclosures. Too often, for instance, companies dismiss legitimate concerns on the part of consumers about the use of private information by pointing to highly complex legal disclosures rather than providing consumers with readily usable information. Even choosing 'opt in' rather than 'opt out' strategies or setting 'do not track' as the default option in various e-commerce settings can help establish a greater sense of trust between companies and consumers. Transparency also requires clear and concise communication, and in this regard we would recommend that companies adopt standards similar to the Federal Plain Language Guidelines in developing privacy and security policies. Above all, the commitment to transparency should be embraced as a more than a mere procedural legal requirement, but should be seen as part of a genuine effort to communicate with consumers.

Finally, at a more macro level, professional and legal norms may need to be adjusted in order to more properly reflect the unique realties of e-business and the ethical issues it engenders. Since companies committed to ethical e-business practices may be put at an unfair advantage if other companies fail to comply with appropriate ethical standards, it is important that industry standards and legal regulations are developed in directions that are more sensitive to privacy and security concerns. Companies should not resist such efforts, as has sometimes happened in the past, but should actively encourage their development and participate as active partners in the discussion over what standards provide appropriate protections. Certainly there is much else that companies can and should do to inculcate best ethical practices in e-business, but the above discussion does outline the most important first steps that should be taken as part of any such efforts.

7 Conclusion

There are many other aspects of e-business that call for careful ethical analysis and response, and much more could be profitably said about those issues that we addressed in this chapter. However, the aim of this chapter was not to provide a full account of the ethics of e-business, but rather to argue for the importance of ethical issues in e-business and to provide a general structure for thinking about those issues. By explicating both the general features of e-business that give rise to the most ethical challenges as well as examining several specific areas of concerns, this chapter provides both a framework and a heuristic model on how best to approach ethical issues in e-business. We have also suggested some practical guidelines for integrating sound ethical standards into e-business practices. Much work clearly remains to be done, at both the theoretical and practical levels, in addressing the ethical issues of e-business. Nonetheless, in this chapter we hope to have significantly advanced considerations of the transformative nature of e-business and its ethical implications.

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eImage: Elements and Effects of Positive Organizational Online Identity

Steven Walczak, Dawn G. Gregg, Gary L. Borkan and Michael A. Erskine

Abstract Businesses and individuals must appear both capable and trustworthy in order to be successful in the online environment, including electronic commerce transactions. This chapter presents recent findings and implications of these findings on the eImage paradigm first suggested by Gregg and Walczak (MIS Quarterly 32:653–670, 2008). Perceptions of capability and trustworthiness are formed using a variety of digital signals including the aesthetic and informational quality of an individual's or organization's website, third-party evaluations, and electronic communications, among others. Knowledge of the various factors that influence perceptions of capability and trustworthiness will enable individuals and businesses to improve their eImage or online identity. Suggestions are made for future research needed in this domain.

Keywords eImage · Electronic commerce · Online identity · Signaling theory · Website quality

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1 Introduction

Image is more important than reality (Govers et al. 2007).

Online transactions with corporations, commonly known as e-commerce, have been increasing globally with anticipated online sales revenue approaching 1 trillion dollars by 2013, with an annual growth rate of over 19 % (internetretailer.com 2011). This trend is truly global as exemplified by the 30 % growth rate in online sales for South Africa (Zimbabwean 2011). What types of information do e-consumers evaluate concerning products and services they intend to purchase? Furthermore how do they evaluate the reliability or quality and capabilities of e-commerce organizations?

What does an organization's website convey to their various stakeholders? Website appearance, content, and functionality create organizational online identity or eImage. Online and offline reputation of organizations resulting from eImage impacts stakeholders' intentions to transact or interact with these organizations.

IS research shows that factors of website quality and vendor reputation influence consumer behaviours and outcomes including: trust, intention to transact, and continued use (Barnes and Vidgen 2001; Kim and Stoel 2004; McKnight et al. 2004; Ranganathan and Ganapathy 2002; Rosa et al. 2006). These factors have until now been studied in isolation with conflicting results. Therefore, it is proposed to create a unified model of eImage combining these factors influencing user perceptions of e-business, into a comprehensive eImage ontology.

The research reported in this chapter examines how website quality including appearance, content, and other online resources impact stakeholders' intention to transact or interact with the organization and indirectly the development of trust for these organizations. A taxonomy of web user types is presented illustrating differences in how website content and utility are evaluated by classes of stakeholders. Furthermore, development of positive eImage and trust is shown to produce price premiums from e-consumers. We conclude with what businesses can learn and utilize from the reported research and potential for future research directions related to eImage.

The term eImage, first coined by Gregg and Walczak (2008), is defined as the electronic image presented by a business or individual. It is composed of various factors including, identity or website name, the appearance of the website and its' information content, and its' reputation acquired from online ranking systems and user feedback. This definition was later expanded to "all of the characteristics and impressions of a business that are assessable through electronic signals" (Walczak and Gregg 2009).

Similar in many ways to the marketing concept of brand image, a business's eImage is how consumers, investors, suppliers, partners, and the general public perceive the business as experienced through online media. These constituents may be conducting electronic e-commerce business with the organization or may simply be gathering information electronically about the organization.

In marketing the word 'image' is roughly equivalent to reputation; what people believe about a business versus what that business actually is (Reynolds 1965). For a consumer, the perceived image would typically include beliefs in the competence, honesty, reliability, and customer service of the business. For a potential business partner, image perceptions might include the competence, stability, and trustworthiness of the business. As the type of user changes so does the importance of different components of the business's overall eImage. Thus, if the generic factors that are responsible for creating a business's eImage can be formally defined, it will enable comparison of e-business research across domains. Understanding what contributes to a business's eImage will assist researchers in the selection of variables that must be controlled in research projects examining the impact of user perceptions with respect to online behaviour and the subsequent impact for businesses conducting electronic commerce.

Support for eImage oriented business models for website development is starting to appear in practice (Hobbs 2010). The utilization of e-image is also a concern for individuals as well as organizations. Recently, the California Office of Privacy Protection (2012) posted advice for individuals to evaluate their online image both from a privacy perspective and from an image presentation perspective.

The study of eImage is addressed in two ways. First, what website attributes contribute to an organization's eImage, and second, what is the effect of an organization's eImage?

2 eImage Model

The eImage Model, shown in Fig. 1, is a comprehensive unifying ontology developed to identify all external electronic signals that may be used by potential e-commerce participants to form perceptions of an organization. The eImage construct is composed of any and all digital information, in any form, that could be used by a constituent member to form their perceptions on the abilities, capabilities, and trustworthiness of an e-business.

A thorough review of IS research into the usages, perceptions, utilization, and adoption of online information and technologies was conducted in order to identify underlying signals that could impact perceptions of an e-business. From this literature review, five major factors emerge which comprise the eImage model: Information Content, Security, Website Characteristics, Feedback/Reputation, and other contributors (Walczak and Gregg 2009). The eImage concept aligns well with research on branding and reputation found in the Marketing literature. While eImage has focused on the perceptions of corporate websites (Rao and Monroe 1996; Park and Srinivasan 1994) such research can be expanded to include online social networks and mobile applications, which will be examined in the Sect. 4.

The remainder of Sect. 2 will individually examine the various component factors that define eImage. It is important to realize that the component factors

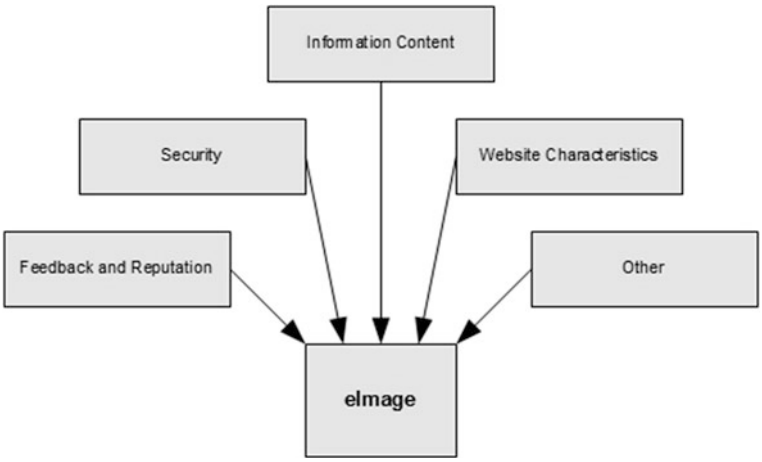

Fig. 1 eImage model [adapted from (Walczak and Gregg 2009)]

define a complex interacting relationship of digital information that when aggregated produce an eImage for an organization, which is equivalent to the perceived quality of the organization by the e-consumer or other constituent.

2.1 Information Content

Information content encompasses electronic signals that include company information, product information, product reviews and other domain information (Walczak and Gregg 2009). An alternate view of information content is the concept dubbed the "stickiness" of websites. This term refers to the ability of the website content to engage and hold a visitor's attention before they navigate away. "Stickiness" is essential to media websites that are able to create additional advertising impressions during extended visits. Investigations of the importance of "stickiness" to corporate websites have revealed conflicting results. For example, Vishwanath and Barnett (2005) have linked "stickiness" with intention to transact and promote "stickiness" as an alternate to the perceived value of website information. In contrast, other research has indicated that "stickiness" could be a negative attribute of an e-commerce site, especially if the site visitor is required to navigate away from the "sticky" content to perform a transaction, such as utilizing a third-party payment service (Bapna et al. 2003). The combined information content a website conveys is cognitively processed by the user contributing to their overall perception of eImage, the amount of time spent, and their likelihood to return.

2.2 Security

The security factor is derived from trust and website quality research. Signals classified into the security factor include security technologies, such as strong password protection and encrypted transmission of data, along with privacy policies. While it may seem that security should include constructs as related to trust, Walczak and Gregg (2009) found that credibility and trust are outcomes of the eImage and not a contributing factor. Thus, the quality of the content provided on the website helps build trust and credibility, one of the main building blocks of eImage.

2.3 Website (Aesthetic) Characteristics

Various website attributes and characteristics can lead to an improved eImage. Navigation logic and website aesthetics comprise the website characteristic factors and have been derived from website quality research. Such website characteristics can include acceptable ease-of-navigation, accessible implementation of technology features, and adequate aesthetic design. Time is one of the greatest costs for individuals gathering information on the web. Hence, ease of navigation and the ability to quickly determine if the desired information is available will positively influence the eImage perception of a business via their website for electronic information seekers. This ease of access to information was the reasoning behind the "3 click rule" heuristic for website design (White 2004), however with the potential vastness of information that may be provided by a website; ease of navigation and a sense that significant progress is being made towards finding information is more important (uxmyths.com 2010).

Additionally, the ease of producing high quality and graphically rich websites through off the shelf tools has increased the expectation of users for high quality and graphically rich websites. Research has shown that media and graphical richness is positively associated with user engagement and user's intention to use the website in the future (Chen et al. 2011). Website quality provides one of these implicit signals and ease of access to desired and relevant information provides another strong signal (Fritz 2007).

2.4 Feedback and Reputation

While the information content, security, and website characteristics factors are related to website quality, there are additional factors influencing eImage. These items include reputation scores, direct feedback, open feedback and inbound links. The importance of feedback and reputation will play an even greater role with the

continued prevalence of online social networks, which is discussed further in the future research section. Additionally, the number of inbound links can signify the level of authority of a website and thus present a positive eImage (Ding et al. 2004). While an organization can control many components of their website, reputation and feedback factors and inbound links are often not directly controlled by an organization.

Reputation scores, provided by reputation scoring systems, allow consumers to rate each transaction with an organization. The prevalence of such systems can be witnessed in online auction systems where often there is little information available to the buyer concerning the seller (Standifird 2001). Research evaluating the impact of reputation scores on transaction outcomes provides conflicting results. For example, some research has shown that reputation scores affect price premiums (Rao and Monroe 1996; McKnight et al. 1998; Rao et al. 1999; Ba and Pavlou 2002) while other research has shown that price premiums are not affected (Zhang and von Dran 2001/2002; Ranganathan and Ganapathy 2002; Gefen and Straub 2003). Gregg and Walczak (2010) found that website quality could cause e-commerce consumers to override any built in biases based on reputation, with higher quality websites leading to increased willingness to transact regardless of vendor reputation.

Direct feedback includes qualitative comments posted by consumers regarding past transactions and are often considered to be more informative than just a reputation score. Many organizations are currently deploying or utilizing direct feedback mechanisms on their websites (Jarvenpaa and Leidner 1999; Kauffman and Wood 2000; Gregg and Walczak 2008) although misdirection can occur when fraudulent or misleading information is posted (Culnan and Armstrong 1999; Belanger et al. 2002; Resnick and Zeckhauser 2002).

2.5 Others

There are several additional diverse electronic signals that affect eImage. These include the business name, third-party information, outbound links, product/service pricing, and the organization's online behavior.

The number of outbound links can also be seen as providing authoritative content (Garrett 2006; Hudson and Gilbert 2006; Mayer et al. 2005), and providing outbound links enables external validation for the decision-making process (Teo et al. 1999; Garrett 2006; Wu and Li 2007). This external validation or extrinsic motivation provides a strong cognitive processing and decision-making influence (Konheim-Kalkstein and Van den Broek 2008).

Third-party digital information such as blogs, twitter posts, and other social networking posts, and digital product reviews affect user perceptions of business quality and a business's customer service reputation (Kiplinger's Staff 2007; Sidali et al. 2009; Walczak and Gregg 2009). Additional other factors include usernames, domain names and URLs (Murphy et al. 2003; Gregg and Walczak 2008).

Finally, the way a business conducts itself online, with respect to interactions with constituents provides another strong digitally-oriented signal on the quality of the business's communication and conflict resolution practices. Specifically, how quickly does a business react to overtly negative (or even positive) Twitter posts and also how quickly does the business respond to email or other electronic communications (Beck 2011; Hudson and Gilbert 2006; Shih 2011; Walczak and Gregg 2009)?

The organization of the various factors that are elements of eImage into 5 groups is meant to help classify and focus attention on the digital signals that influence e-businesses' constituent's perceptions of the business. This list is meant to be comprehensive, but not exhaustive. New elements that impact consumer, investor, employee, and other business constituents may easily be added into the eImage paradigm as evidence is gained to support these new influencers of perception.

3 Effects of eImage

The effects of eImage can be broken down into five main areas: the effect eImage has on the consumers' willingness to transact with online businesses, the effect on willingness to pay price premiums, the development of trust through implicit signals, the effects of eImage as it is influenced by risks associated with different product types, and satisfying the varying information needs of different constituencies. Since eImage is the aggregated collection of all digital information and signals that influence perceptions of an e-business's abilities, capabilities, and trustworthiness (see Fig. 1), much of the effect of overall eImage is better understood by validating how the various factors that comprise eImage themselves impact the five listed outcomes from eImage.

3.1 Willingness to Transact

As previously discussed consumers' perceptions of quality and trust contribute to an organization's eImage. Prior website quality research has found that the website quality does impact the purchase intentions of consumers (Gregg and Walczak 2008, 2010; Park et al. 2004; Ranganathan and Ganapathy 2002). This is consistent with studies related to information disclosure in accounting and auditing that have found improved information disclosure reduces the information risk to investors, providing a motivation to transact (Elliott and Jacobson 1994; Jahmani 2003). Exchange theory supports this, suggesting that individuals favor exchange relationships that are more likely to be successful (Thibaut and Kelley 1959; Lee 1998). Since eImage can signal consumers about unobservable product or company quality (Rao et al. 1999), exchange theory suggests that improving and

increasing the positive perception of a business's eImage contributes to an increased willingness to transact with any particular online business. This has important implications for businesses in the online environment, which must have the specific abilities to complete transactions successfully (process payments, package the item appropriately, and ship in a timely fashion) in order to be competitive in the market place.

This is supported by website quality research which has found that website quality does impact the purchase intentions of consumers (Ranganathan and Ganapathy 2002). Thus, it is likely that both website quality and trust play an important role in increasing positive eImage leading to increased consumer intention to transact with a given online vendor.

Other research on the development of trust in online environments suggests that willingness to buy from unknown vendors (e.g. online vendors with whom they have had no prior transactions) is contingent on the vendor's ability to build initial trust and therefore a more positive eImage in potential consumers (Gregg and Walczak 2010). When consumers have a choice between alternate online vendors, they will have increased willingness to transact with vendors that have a more positive eImage.

3.2 Price Premiums

Economic theory suggests that price premiums are justified in situations where businesses provide a higher quality product or service (Klein and Leffler 1981). It also suggests that the price–quality correlation increases with information (Tellis and Wernerfelt 1987).

Price premiums help compensate preferred businesses for reducing transaction risks (Rao and Monroe 1996). Increasing eImage quality can improve the information available for consumer decision-making and help to remove uncertainty surrounding the transaction and consequently reduce perceived risk.

Website quality is an important mechanism for building initial trust online. It has been shown that the quality of an individual website can be used to establish a favorable perception of an online vendor without any personal interactions (Gregg and Walczak 2010).

A positive eImage is likely then to have a corresponding positive effect on prices consumers are willing to pay because it increases their confidence in the quality of the business's goods and services (Rindova et al. 2005). Positive eImage derived through a websites presentation of quality information consisting of accurate and complete product data, professionally presented in an organized, usable, understandable, and aesthetically pleasing manner, signals to the online consumer that they are dealing with an organization that possesses the appropriate business skills to be trusted, and to deliver quality products and services (Gregg and Walczak 2008). A competitive advantage is therefore created by positive eImage.

This indicates that individual choices with respect to eImage can significantly affect the revenue generated by online businesses. An economic incentive therefore exists for presenting and maintaining a positive professional online eImage that will influence a consumers' willingness to pay a price premium for products or services, over those of competitors with a less positive eImage.

3.3 Trust

Trust has received considerable attention within the e-commerce domain, especially in regards to its effects on consumer behavior. Early research associated trust as an individual's expressions of confidence in others' intentions and motives (Read 1962; Deutsch 1958; Mellinger 1956). More recently, trust has been defined as an individual's confidence in another's conduct, when the individual is in a position of vulnerability or cannot monitor or control the other party (Hosmer 1995; Lewicki et al. 1998; Mayer and Davis 1995).

Trust is an important construct whenever two parties engage in a transaction and is especially important for ecommerce transactions (Koufaris and Hampton-Sosa 2004) where transactions occur between unknown parties operating at unknown locations. Several studies have found that consumers' concerns about website trustworthiness are a major obstacle to consumers' willingness to share personal information or engage in on-line transactions (Dinev and Hart 2004). Studies have found that increasing trust can improve attitudes towards a company and improve transaction or interaction likelihood with that company (Bhattacherjee 2002). Further, studies indicate that websites that establish high levels of trust are able to demand higher prices than websites that elicit comparatively low levels of trust (Ba and Pavlou 2002).

Research into trust in the online environment has suggested that appropriate trust building mechanisms are necessary for creating initial trust in unknown vendors (Ba and Pavlou 2002; Jarvenpaa and Tractinsky 1999; Clemons 2007). It has been found that increasing trust through accreditation mechanism and feedback systems, thereby increasing positive eImage results in a reduction of uncertainty increasing average prices of items (Ba and Pavlou 2002; Lee 1998). Research has also shown that that trust can be built solely on visual and informational cues without knowledge of the vendor's history, familiarity with the vendor, or any personal interaction (Gregg and Walczak 2010). Thus, trust may be developed in an organization's abilities, capabilities, and trustworthiness through the transmission of implicit signals contained in their websites.

A positive eImage results in an increased perception of trust for an organization with a corresponding increase in the likelihood to transact, with a higher dividend (Bhattacherjee 2002).

3.4 Risk and Product Type

Perceived risk can be thought of as a consumer's belief regarding the probability of gains or losses associated with a particular transaction (Mayer and Davis 1995). In online transactions, consumers find it more difficult to assess the quality of certain types of products, creating a risk that the product delivered will not meet their quality expectations (Ba and Pavlou 2002; Gregg and Scott 2006). Theories from economics of information (Nelson 1970) have been used to identify product characteristics that increase online product risk. These characteristics include high product description complexity (De Figueiredo 2000; Jahng et al. 2000), and variability in functionality (Akerlof 1970; Bakos and Kemerer 1992; Resnick et al. 2000). For example, used products are believed to have higher transaction-specific risks because there is the increased possibility that the condition or functionality of the product being sold will not be captured completely in the product description (Scott and Gregg 2004).

Perceptions of risk can influence online transactions in two ways. First, prior research has found that increased perceptions of risk decrease consumers' willingness to transact (Jarvenpaa and Tractinsky 1999; Jarvenpaa et al. 2000; McKnight et al. 2002; Pavlou 2003). Second, perceptions of risk can increase consumers' price sensitivity. It has been shown that businesses which reduce transaction risks may achieve price premiums (Rao and Monroe 1996), however such premiums are dependent on the perceived risk associated with the transaction (Ba and Pavlou 2002). Therefore, product risk has the potential to moderate the effect of eImage on consumer willingness to transact and on price premiums. However, additional research examining these moderating effects found that consumers prefer transacting with businesses exhibiting positive eImage, regardless of the perceived risk derived through product type. Additionally a significant interaction effect between eImage and new/used product type with respect to closing prices was found (Greg and Walczak 2008).

It is seen then that online vendors with positive eImage have a higher probability to complete transactions independent of product risk, but when product risk does exist, higher price premiums accrue to the positive eImage seller.

3.5 Identifying Varying Information Needs

eImage is not limited to perceptions of a business with regard to its electronic commerce transactions. A business typically has many stakeholders in addition to its consumers including: employees, suppliers, investors, regulatory agencies, and even the public at large.

Ease of access to desired and relevant information provides a strong signal of business capability and trustworthiness (Fritz 2007). Finding relevant information on business websites is critical to eImage and developing trust (Haynes and Taylor 2006; Nandan 2005; Petre et al. 2006).

Prior research has found that the type of information sought by various constituents of a business varies, specifically between potential employees versus consumers (Walczak and Gregg 2009). The same may be said for other business constituents such as investors, partners, and suppliers. The ability to customize a website to fit the needs of individual consumers is already being practiced through the use of cookies and other website customization options made available to consumers. These techniques may be expanded to create customizable websites that facilitate access to information relevant for the particular business constituent to strengthen the organization's eImage, perceptions of the organization's capabilities, and the consequent development of trust in the organization.

4 Future eImage Research

eImage is a relatively new area of research and thus, it has significant potential for future research. For example, the pervasiveness of mobile technologies, increases in the use of social networks, and the global reach of the Internet all provide an opportunity to explore additional factors of eImage. Furthermore, there is little understanding about how industry type may influence the mix of relevant eImage factors. Additional research needs to be done to extend the understanding of the influence on the feedback and reputation factors of eImage, by posts that occur on social sites including Facebook, Twitter, and the newly emerged Pinterest.

4.1 Mobile Perspectives

During the last decade, mobile devices such as smartphones, and smart tablets, have proliferated. Currently, there are nearly 6 billion accounts on mobile-cellular systems. In addition, there are nearly 1.2 billion active mobile broadband subscriptions (ITU 2011). Facebook, one of the largest social networking sites, has over 350 million mobile devices that regularly connect to its service. Mobile interactions can occur through versions of an organization's website that are optimized for mobile devices, through an organization's online mobile commerce capability or through an organization's ability to deliver a mobile application successfully. The prevalence of mobile devices has made the importance of a mobile strategy more important than ever, yet is still often overlooked by organizations.

Online mobile commerce, often referred to as m-commerce, has experienced tremendous growth along with the proliferation of mobile devices. Amid the continuing growth of mobile technologies, enhancing an organization's mobile eImage has the potential to be an important aspect of an organization's overall mobile strategy. Factors that may play a role and require further research in mobile eImage include adapting to the smaller footprint of mobile devices and the need to switch between cellular broadband (such as 3G and 4G) and local wireless network connectivity.

How will the smaller footprint of mobile devices impact the design and delivery of highly positive eImages for organizations? Will time delays experienced on cellular networks negatively impact eImage? These are examples of research questions which will need to be addressed as mobile devices become more ubiquitous.

4.2 International Perspectives

While current eImage research has focused primarily in the United States, the global capabilities of the Internet provide the need for a wider field for study. For example, in 2009, China alone had approximately 389 million Internet users, while the United States had only 245 million (CIA 2011). Also, about 75 % of all Facebook users connect to the social networking service from outside the United States. Such numbers demonstrate the importance of understanding how international constituents perceive organizations. Furthermore, it also suggests a necessity to understand the eImage factors that impact perceptions of an organization by different cultures.

Prior research has already examined differences in knowledge acquisition, transmission, and consumption between collectivist and individualistic cultures (Kim et al. 2011; Walczak 2008). Future research needs is required to examine the differing information requirements of collectivist versus individualistic cultures and how international organizations can meet the varying information needs of their respective desired cultures. Additional research may also focus on aesthetic evaluation differences between cultures to enable a more positive eImage through appropriate aesthetic design of their websites.

4.3 Social Perspectives

As social media plays an increasingly prominent role in our society, and allows consumers to intentionally or unintentionally participate in the crafting of an organization's eImage. Social networking platforms such as Facebook, Twitter, YouTube, LinkedIn, Pinterest, blogs, and community forums now play a significant role in the way companies communicate with all of their constituents. Research suggests that twenty-first century business must strategically embrace social media to remain successful (Shih 2011).

The impact of social media on any model of eImage cannot be ignored. As of November 2011, Facebook had over 800 million active users of which over 50 % connect with the network daily. In their study, Milano et al. (2011), analyzed visits to 19,902 Italian tourism and hospitality websites and discovered that up to 32 % of visits were referred directly from Facebook. This suggests that social media sites like Facebook have the potential to be one of the most significant determinants of eImage in today's online world.

Social media has the potential to impact eImage in a variety of ways. The inclusion of a simple visit counter has been found to imply popularity and reliability of information content (Hernández-Borges et al. 2003). The use of social media integration, which allows visitors to "like" content, could not only further imply popularity, but also provide popularity in the context of one's own social groups, thus reinforcing intrinsic goals.

Another way social media can impact eImage is by allowing organizations to participate in online social networks to build eImage. For example, it has been suggest that the posting of information and social engagement of key company employees, such as executives, should be explored by researchers (Walczak and Gregg 2009). In addition, social media tools such as blogs, microblogs and multimedia are increasingly being used by companies to demonstrate knowledge about their fields and to build the credibility for a company, brand or product (Kabani 2010).

While some of the content posted to online social networks can be controlled by an organization, often times the content will be created and shared by the consumers directly. For example, using social media a customer can broadcast a criticism instantly, to which a proactive business can respond immediately, if such social media streams are actively followed (Benn 2010). Previous research has indicated that eImage is not just about electronic content which impacts perceptions of organizational quality and capability, but also constituents' perceptions of the availability, integrity, and communication or customer relationship strategies of the organization (Walczak and Gregg 2009). Thus organizations need to adopt policy and processes that enables them to rapidly respond to tweets, email, and other open electronic feedback sources. Such phenomena are accounted for in the current eImage model as "feedback". However, the dynamic nature of social media and its growing ubiquity suggests the additional research is needed to fully understand its role in the development of organizational eImage.

4.4 Industry-Context Perspectives

Another area that needs further exploration is how an eImage differs across industry types. The effects of eImage on a constituent are likely to be dissimilar in different industries. For example, consumer expectations of a banking website is likely to be that appropriate services are provided and that elements suggesting high levels of trust are included. Such factors are likely less important to a consumer visiting an entertainment organization's website. The expectations for this type of site will be that it is entertaining and that it is much more graphically vivid.

5 Conclusions

The goal of this chapter has been to present a comprehensive ontology related to eImage and the effects it has on consumer willingness to transact with a company and to pay price premiums as well as the trust and perception of business quality by other constituents. The idea of eImage is similar to the concept of reputation found in marketing. An online vendors' eImage represents the mental image of the qualities of a business constructed by organization constituents from various electronic signals.

These determinants of a business's eImage consist of several components, including:

- information content made up of company and product information, reviews, and other domain information;
- security features and privacy policies;
- website characteristics including ease and intuitiveness of site navigation as well as its design aesthetics;
- feedback derived from other electronic information sources, including blogs and open feedback forums, and type, number, and quality of inbound links, all of which contribute to the general reputation of the business;
- prior experience with the business, including email communications, and availability and ease of contact; and
- additional elements such as business name, third party review sites, information links, and pricing.

It has been found that eImage has a significant impact in the conduct of online commerce. The only information potential customers have about an online business is the information provided by the website itself and feedback posted on third party review sites. Thus, the additional information provided by positive eImage businesses helps mitigate perceived business quality risks.

Consistent with signaling theory (Spence 1973), research indicates that increasing the positive perception of a business's eImage contributes to an increased consumer willingness to transact with these online businesses. A positive eImage also results in a willingness of the online buyer to pay price premiums (Gregg and Walczak 2008). This suggests that a business's eImage signals to potential consumers that the business has the abilities necessary to be a successful and reputable online business, which has important implications for businesses in the online environment that must have the specific abilities to complete transactions successfully (e.g., process payments, package the item appropriately, and ship in a timely fashion).

While willingness to transact is not changed by product risk, the price premiums realized by businesses with a positive eImage are. Research suggests that a positive eImage contributes to increased trust in the online vendor, an intention to purchasing and a willingness to pay price premiums, especially for more risky "used" products (Gregg and Walczak 2008).

The greatest lessons to be learned and applied by online businesses from this line of research is that the creation and maintenance of positive eImage leads to more completed transactions, at higher prices, yielding greater profitability, and competitive advantage in the online market place. Additionally, perception of a high quality eImage may attract more reliable investors and other business constituents.

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Online Complaint Communication Strategy: An Integrated Management Framework for e-Businesses

Jan Breitsohl, Marwan Khammash and Gareth Griffiths

Abstract The purpose of this chapter is to provide a holistic framework of contemporary complaint communication management on the Internet. Specifically, a model for e-businesses strategy is put forward which integrates the communication perspective of online complainers, the company as respondents and observers who follow the complaint dialogue online. In acknowledgement of the active or passive influence of each communication participant on the exchange process, the particular characteristics of online complaint psychology, electronic communication channels and related management systems are reflected within a circular process model that highlights the need for e-managers to develop and implement strategic means to proactively control and respond to negative publicity on the Internet. By distinctively focusing on studies from communication psychology, strategic management, marketing and Information technology that were conducted in an online environment, this chapter aims to address the lack of literary integration with regards to the unique managerial demands posed through online complaint communication paradigms.

Keywords Complaint behaviour · Complaint response, complaint management · Communication psychology · Online strategy · Consumer psychology

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1 Introduction

The need for e-businesses to adjust existing complaint management strategies to an online context where consumer communication behaviour and service expectations differ significantly from offline environments continuously increases with the number of consumers who realise the potential and power of online complaining (Ariely 2007; McGregor 2008; Rezabakhsh et al. 2006). In addition, online complaints commonly take place on public platforms (e.g. complaint forums, company Facebook profiles, protest websites) which experience a constantly increasing participation of information-seeking consumers and hence present a far-reaching influence on corporate image perceptions (Shoham 2004; Tripp and Grégoire 2011).

Consumers' online complaint behaviour may therefore be defined by the chosen addressee of the complaint message and the related inherent complaint purpose. Accordingly, online complaint behaviour is here classified into 'e-complaints' which represent a solution-oriented customer-to-business (C–B) communication process, and 'negative electronic WOM' which denotes a problem-focused consumer-to-consumer (C–C) exchange. Although the crucial focus is on e-business-strategy and respective e-complaints, this chapter will include the perspective of anonymous, opinion-seeking 'Observers' (Breitsohl et al. 2010) who have access to company-directed e-complaints on public platforms (see Sect. 4).

Fundamentally, this chapter suggests a holistic online complaint communication framework which integrates the psychological frame of e-complaint behaviour as well as the particular characteristics of online communication channels and management systems into respective corporate e-complaint response strategies. Drawing on research from communication psychology, strategic management, e-marketing and information technology, the authors aim to thereby extend current complaint management strategies to the crucially underresearched e-complaint communication paradigm.

2 Complaint Management Strategies in Perspective

Traditionally, customer complaints were regarded as negative events, i.e. as indicators of quality concerns or corporate failure. Hence, a majority of companies engaged in defensive communication strategies by denying the complaint issue, offering materialistic solutions 'out of courtesy' or simply ignoring the complaint (Dubé and Maute 1998; Hansen et al. 2010). Yet, with the rise of customer-centred marketing philosophies and the systematic development of relationship management strategies in the 1990s, complaints were increasingly understood to be personalised communication opportunities at the request of the customer (Homburg et al. 2010; Volkov 2004). Moreover, a successful recovery effort was found to actually result in a customer's post-complaint satisfaction being at a higher level

than the original pre-complaint satisfaction, a long-debated concept known as 'recovery paradox' (Maxham and Netemeyer 2002; McCollough et al. 2000). Complaint management strategies consequently focused on staff communication training and generous guarantee and returns policies based on direct, one-to-one communication scenarios between the complainer and company via phone, letter or in person (Maxham and Netemeyer 2003; Michel et al. 2009; Priluck and Lala 2009). Crucially however, this view ignored the related perceived psychological costs of complaining, such as the fear of confrontational communication, social anxiety as well as time and effort involved in making a complaint (Alicke et al. 1992; Kowalski 1996).

The growing influence of the Internet at the start of the new century and the more recent social media networking trend have consequently exposed the passivity of prevailing complaint management strategies with regards to profiling and effectively communicating to e-complainers. As such, the public, intertextual and instantaneous character of online communication channels (e.g. public forums, virtual worlds or Twitter) necessitates the transformation of existing complaint management approaches into pro-active, multidimensional and continuous e-communication strategies (Holloway and Beatty 2003; Khammash and Griffiths 2011; Song and Zinkhan 2008).

3 e-Complaint Communication Management Framework

From a consumer's perspective, the Internet has significantly lowered the psychological barriers to complain as customers are in full control over the extent and depth of the communication exchange with regards to content, timing, self-presentational cues and subsequent reciprocity (Kozinets et al. 2010; Schlosser 2005; Sousa and Voss 2009). The additional ease with which a complaint can be reproduced electronically encourages multiple negative communication behaviours, i.e. the use of multiple complaint channels to reach different target audiences (Hennig-Thurau et al. 2010; Metzger 2007).

For e-businesses, the growth in communication complexity represents both a threat and opportunity. In comparison to offline complaint management, the anonymity of e-complainers—specifically the absence of visual or voice cues—constrains profiling techniques to complaint content analyses and henceforth a related perception of less control and influenceability (Godes et al. 2005; Litvin et al. 2008; Rains 2007). Moreover, e-complaints carry an implicit expectation of immediacy and, when placed on public platforms, render any corporate response permanent and accessible to a global, interrelated audience (Mattila and Mount 2003; Parasuraman 2005).

The consequential necessity for continuous interaction and negotiation of meaning with e-complainers and wider audiences may, on the other hand, provide e-businesses with the opportunities to promote their image, customer relationship policies and personalisation strategies. As compared to TV-advertisement for

example, consumers' misinterpretations can be corrected for and interactions on public online channels may be seen as data collection opportunity for the continuous improvement of complaint database intelligence. Considering the increasing sophistication of e-management tools that semantically search and analyse consumers' online communication (Das and Chen 2007; Shaw et al. 2001) as well as the growing numbers of academic articles focusing on the linguistic optimisation of (often automated) complaint feedback messages (Coussement and Vandenpoel 2008; Galitsky et al. 2009), the seemingly disadvantageous lack of control over the e-complaint communication process may be outbalanced by the enhanced credibility achieved through carefully framing complaint response strategies (Breitsohl et al. 2010).

Contemporary e-complaint management is thus seen as a holistic business activity which does not simply involve reacting towards voiced complaints but encapsulates the pro-active and permanent participation in the entire complaint communication process as demonstrated in Fig. 1.

Specifically, the here illustrated model proposes an e-complaint management strategy that concentrates on the analytical understanding of nine critical components:

1. The pre-complaint consideration set (Complaint cause and Dissatisfaction)
2. The e-complaint decision (Complainers vs. Non-complainers)
3. Profiling e-complaint senders (Personality, Demographics, Culture)
4. e-complaint channels (Channel choice and publicity)
5. The e-complaint message (Attitude orientation and Language intensity)

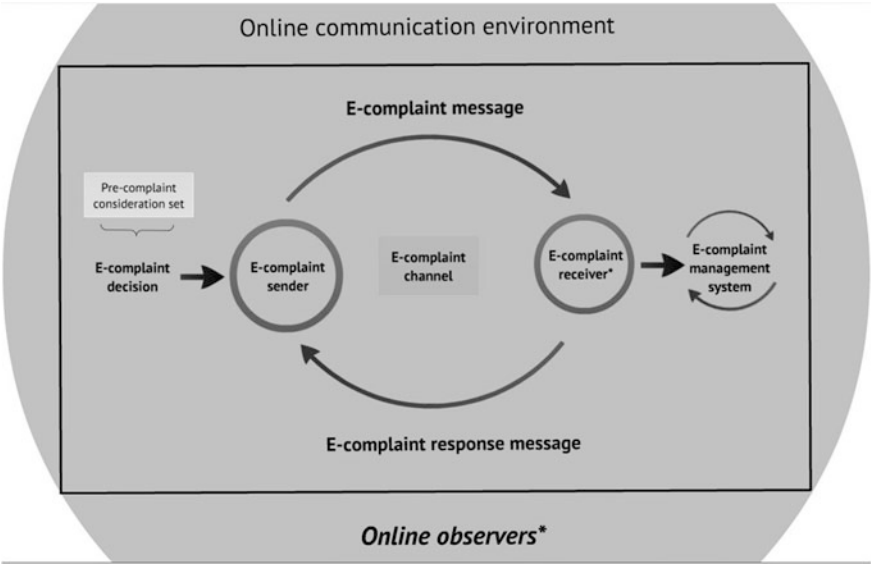

Fig. 1 Integrated e-complaint communication management framework

6. e-complaint receivers (Employees and Observers)
7. Internal e-complaint management systems (IT- and Human elements)
8. The e-complaint response message (Speed, Tone, Content)
9. e-complaint feedback utility evaluations (Perceptions and Outcomes)

This chapter will proceed with an in-depth analysis of each part of the model and a concluding outlook on two emerging issues in e-complaint communication management.

4 Pre-Complaint Consideration Set

A customer's e-complaint consideration set before reaching the decision whether to complain or not comprises two elements: The e-complaint cause and a subsequent dissatisfaction analysis.

The complaint cause is grounded in a customers' comparison between an expected and actual product/service experience. According to most complaint scholars (Anderson 1973; Goodwin and Ross 1992; Harrison-Walker 2001), a negative mismatch between expectations and actual experience may dominantly be based on material and psychological reasons. Whereas the customer readily and explicitly communicates material reasons such as delays in delivery or a faulty product—which is encouraged by website complaint forums providing the option to select predefined material complaint reasons—complaint considerations often carry a psychological element that is more difficult to be compensated for by tangible means.

Peck and Childers (2003) and Rao et al. (2011) for instance demonstrate the significance of online order anxiety (e.g. due to the absent possibility of physically examining a product) on customers' expectations of product failures and future evaluative schemata, i.e. mental predispositions which negatively influence subsequent expectations. In relation, Ringberg et al. (2007) suggest that consumers differ in their recovery preferences based on culturally influenced schemata which affect pre-complaint evaluations.

The resulting mismatch between expectations and performance leads to a perceived underperformance and a consequential evaluation of subjective dissatisfaction which most managerial complaint behaviour models tend to conceptualise within the seminal psychological cognition- affect paradigm (Chebat et al. 2005; Oliver 1980; Schoefer 2008). Cognitive appraisals are influenced by factors such as goal relevance, future expectations and ego-involvement, whereas affective appraisals refer to anger, sadness or fear (Stephens and Gwinner 1998).

As much as these models may still present a feasible framework for analysing the manifestation of consumers' dissatisfaction, two current streams of research present a conceptual challenge: Complaints without consumption-related dissatisfaction and an emotional dominance in appraisal processes.

First, in light of the lowered psychological barriers to complain online, psychological studies have emphasised that consumers may actually consider complaining without being dissatisfied at all. For instance, Kowalski (1996) promotes the idea of 'chronic complainers' who may not undergo cognitive or emotional appraisal processes of an actual consumption experience but simply consider to complain as a possible relief valve for a negative internal psychic state. These tendencies may be exemplified in the growing popularity of complaint forum such as 'complaint.com' and undirected negative communication blogs (e.g. 'thecomplainingwebsite.com') where complaining is the dominant self-presentational strategy and acts as means of social re-affirmation (Kowalski 2002; Marquis and Filiatrault 2002).

Secondly, whilst acknowledging dissatisfaction as the overall focal construct of influence in consumers' complaint considerations, recent studies have investigated the influence of specific inherent emotions (e.g. anger, guilt, sadness) and promote their simultaneous, ongoing influence which seemingly dominates the pre- and actual complaint decision-making process (Bougie et al. 2003; Soscia 2007; Gelbrich 2009). For instance, Bougie et al. (2003) find 'anger' to significantly mediate pre-complaint considerations and enhance complaint behaviour whereas Gelbrich (2009) demonstrates that feelings of 'helplessness' negatively influence complaining. Figure 2 proposes a complaint consideration set model adopted for the here discussed online paradigm:

5 The e-Complaint Decision

What then causes a consumer's dissatisfaction to translate into the decision to complain?

Crucial influences on the actual complaint decision are suggested to be customer expectations with regards to complaint success and recovery rewards (Kim et al. 2003; Richins 1983; Singh and Wilkes 1996), situational circumstances such as witnessed service recovery efforts for other consumers (Huang 2010) and channel availability (Mattila and Wirtz 2004).

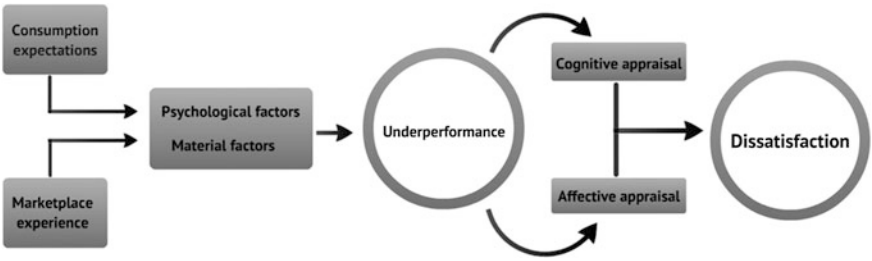

Fig. 2 Pre-complaint consideration set (based on Stephens and Gwinner 1998)

Importantly though, research findings indicate that the majority of dissatisfied consumers actually refrain from complaining (Andreasen and Best 1977; Day et al. 1981; Stephens and Gwinner 1998) and to quietly and irrevocably exit the marketplace instead, a phenomenon which gave rise to labelling these customers as 'silent voices' (Chebat et al. 2005) or 'non-complainers' (Droge 1991). The damage of silent customer exit in terms of high costs of new customer acquisitions and missed opportunities to improve internal quality standards (Ang and Buttle 2011; Homburg et al. 2010) has led e-businesses to consider the response to public e-complaints as means to promote generous complaint policies and in doing so to implicitly lower non-complaining observers' psychological barriers in their future complaint decisions (see Sect. 12). As aforementioned, (company-directed) complaints are now increasingly posted on public platforms. Since it seems myopic to assume that non-complainers are also non-participants in marketplace communication, they may rather represent silent opinion-seekers who emotionally identify and idealise the courage of public e-complainers (Baker et al. 2011; Burton and Khammash 2010; McGrath 1995).

In a comparative study between complainers and non-complainers, Voorhees et al. (2006) suggest personality factors to be the decisive factor in complaint decision-making (see next section). In relation, recent studies propose non-complainers to be less impulsive and self-monitoring (Sharma et al. 2010) and to have a lower sense of justice as well as a less positive attitude towards complaining (Phau and Baird 2008). However, the difficulty in defining non-complainers is exemplified by opposing research from Bodey and Grace (2007) which puts forward that personality traits do not influence non-complainers behaviour.

Due to these ambiguous findings and limited research on related online behaviour, this chapter will therefore dominantly concentrate on targetable e-complainers and the related indirect effects on (non-complaining) observers.

6 Profiling e-Complaint Senders

e-complainers may be profiled according to three decisive criteria: personality, demographics and culture.

6.1 Personality

Research on personality traits in an offline complaint context has been extensive and includes concepts such as self-confidence, self-esteem, self-presentation, individualism, self-monitoring, extroversion and self-efficacy (Bennett 1997; Bodey and Grace 2007; Keng et al. 1995; Liu and McClure 2001; Phau and Baird 2008; Thøgersen et al. 2009).

One of the few studies on e-complainers personality characteristics identified 'Type A personality patterns' (e.g. time urgency, impatience, aggression) and locus of control as defining predictors (Huang and Chang 2008). In relation, Chang and Chin (2011) find perceived behavioural control to be a stronger influence on intention to complain online than attitude or subjective norm. These findings highlight the necessity to re-investigate personality traits in an online context where a transformed communication paradigm seems to have shifted psychological barriers away from social norms and towards internal needs.

6.2 Demographics

In terms of demographics, studies on e-complaint behaviour and online communication seem to suggest that complainers are well-educated, younger and generate higher incomes (Ahmad 2002; Dolinsky 1994; Pinto and Mansfield 2011). However, a recent study by Schoefer and Diamantopoulos (2009) on service recovery communication in online discussion groups does not find evidence for the utility of demographics in profiling online complainants and consequently indicates a need for further research.

A particularly fruitful research target in this regard seem to be silver surfers, i.e. consumers aged 55 and above who increasingly and confidently engage in social online networking and purchasing activities (AXA 2008; Vuori and Holmlund-Rytkönen 2005) and yet appear to experience higher barriers to complain online (Grougiou and Pettigrew 2009; Jaeger 2009).

6.3 Culture

Since online complaint communication is accessible to a global audience, it is crucial to understand the particular cultural differences of online complaint senders, especially when considering the increasing numbers of bilingual and bicultural e-consumers (see final section). Wan (2011) for instance finds cultural differences in the perception of embarrassment to significantly affect complaint likelihood where consumers from Eastern cultures are more likely to complain about a service failure the higher their related embarrassment, as opposed to Western consumers. Other studies suggest that in Western cultures more active and rapid complaint handling is expected (Lin 2011), whereas in Eastern cultures product or service failures tend to be forgiven more readily (Ekiz and Au 2011).

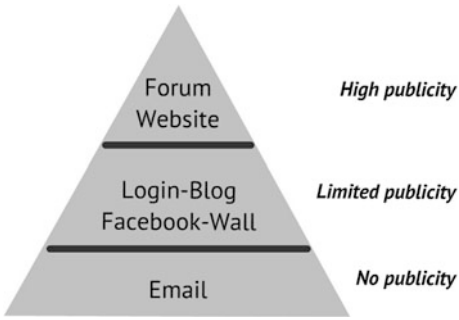

Fig. 3 Degrees of publicity in e-complaint communication channels

7 e-Complaint Channels

As can be seen in Fig. 3, e-complainers' channel choice is crucially determined by the desired degree of communication publicity.

Private e-complaint channels include emails and exclusive feedback provisions on company websites, whereas public channels refer to online forums, blogs, virtual communities, protest websites and, more recently, video channels. However, it has to be noted that online complaint communication only offers a *perceived* knowledge of the degree of publicity since the sender lacks control over the receiving audience (i.e. emails can be passed on, blogs are accessed at varying frequencies etc.). As such, an explicit communication regarding the degree of transparency to complaint channel participants has proven to be highly effective in order to create online trust (Holloway et al. 2009; McKnight et al. 2002). In relation, scholars emphasise the importance for e-businesses to provide multiple communication channels to increase channel attractiveness based on customers' communication preferences (Geyskens et al. 1999; Hennig-Thurau et al. 2010; Vandijk et al. 2007).

With regards to consumers' perceptions of the varying degrees of publicity, one of the crucial determining factors of complaint channel choice is public consciousness. Whereas email-communication allows consumers to engage in exclusive one-to-one exchanges with a company representative, virtual communities such as social networks allow for interactive one-to-many conversations. In a related seminal paper, Marquis and Filiatrault (2002) find that complainers with a high public consciousness prefer less public complaint channels. In relation, Mattila and Wirtz (2004) provide evidence that complainers who are high in 'shame proneness' prefer less interactive online complaint channels. With regards to e-complaint management strategies, Nyer and Gopinath (2005) stress the significance of perceived public commitment, suggesting that complainers who use interactive public channels will be likely to stick to an originally expressed dissatisfaction statement and consequently require additional corporate communication recovery efforts.

In general, the social acceptability of negative communication seems to have grown in line with public online platforms as is indicated by Ward and Ostrom (2006) who highlight the reinforcing nature of e-complaining on websites specifically created for consumer protests.

8 The e-Complaint Message

The character of an e-complaint message can be directly linked to channel choice. Communication psychologists have empirically shown that the degree of publicity of a chosen communication channel influences message characteristics (Lee and Song 2010; Schultz et al. 2011). Although related research is rather limited, e-complaint managers may utilise two core concepts as framework of analysis: attitude orientation and language intensity.

Attitude orientation refers to the cognitive (i.e. rational, informational) or affective (i.e. personal, belief-based) character of the complaint message content (Breitsohl et al. 2010; Mehrabian and Wiener 1967). Furthermore, both orientations may contain social cues and indicate how the sender perceives the computer-mediated relationship (Tidwell and Walther 2002; Walther 2001). As will be outlined in Sect. 11, complaint response communication strategies may thus rely on matching cognitive and emotive orientations to enhance credibility judgements and perceived familiarity (Hilligoss and Rieh 2008).

In relation, Harris (2007) provides evidence that the language intensity of a message can be used to make inferences about the emotional state of a sender. However, when language intensity indicates negative arousal, Aune and Kikuchi (1993) propose not to seek linguistic response congruity as it is negatively related to credibility perceptions. Nevertheless, for other emotional cues in complaint messages, Burgoon and Miller (1971) highlight the positive effect of matching intensity which is supported by Hamilton (1998) who empirically demonstrates that the less message discrepancy is present in a response, the more trustworthy it is perceived to be.

In addition, in order to make inferences about the authenticity of anonymous complaint senders, linguistic psychologist suggest focusing on argument quality and extremity of a given claim (Pornpitakpan 2004).

9 e-Complaint Receivers

Research on receivers of direct private complaints in an online context has been largely unexplored since, in most e-businesses, online complaints tend to be a subdivision of customer service management where the first stage of communication takes place without human involvement, i.e. in form of an electronic and automated response message that acknowledges the customer's e-complaint (see

next section). However, online businesses have recently started to personalise e-complaint responses by shifting the interpretive power to employees as complaint receivers (Bowen and Johnston 1999; Homburg and Fürst 2005; Smith and Karwan 2009)

Offline and online research suggests that negative message decoding is influenced by mood, gender, and communication channel (Bae and Lee 2010; Gallois and Callan 1986). In addition, the long-term effects of being the recipient of negative communication have been demonstrated to cause less effective responses as decoding sensitivity decreases (Bell 2006; Eysenck et al. 1991; Peeters and Czapinski 1990) and hence employee communication training programmes may prove to be most effective in this context (Liao 2007; Luria et al. 2009; Michel et al. 2009).

As already mentioned in the context of non-complainers, e-businesses have to further address that e-complaints increasingly take place on public channels which extend the receiver communication paradigm to anonymous observers or 'Lurkers' (Schlosser 2005). In their seminal article, Burton and Khammash (2010) suggest eight influences on online observer's reading motives: Self-, Social and Empowerment perceptions, Economic-, Product- and Site-involvement, and related Purchase-decision considerations. Moreover, with a specific focus on negative observers, Huang et al. (2007) emphasise reading motives to be either of an instrumental (fact-oriented) or interpersonal (affect-oriented) nature. As highlighted in Sect. 11, further research is needed to explore how these motives may educate corporate response strategies.

10 Internal e-Complaint Management Systems

Company receivers of direct e-complaints increasingly rely on advanced IT-communication systems in order to record, cluster and respond to individual complaints. As a result, Smith et al. (2009) have empirically analysed the effectiveness of operational complaint management systems and emphasise the significance of seven components, five of which are here adopted to account for online complaint environments (see Table 1).

The same authors provide evidence that such advanced and integrated complaint management systems—which have so far dominantly been used by large, mature organisations—have positive effects on customer satisfaction, capability improvements (e.g. organisational learning), market performance and perceived external outcomes such as speed and empathy (*ibid.*).

In relation to the complaint dialogue communication scenario mentioned in the previous section, Galitsky et al. (2009) have recently demonstrated how machine learning and specifically visualisation techniques (i.e. labelled graphs) which analyse complaint dialogue dynamics can be used to improve classification accuracy and automated complaint management decision-making. Another increasingly popular analytical tool, social network analysis, may further educate

Table 1 e-complaint management system adopted from Smith et al. (2009)

Component	Complaint management example
Influence	e.g. customer involvement possibilities via social media feedback provision and proactive, entertaining communication strategies
Decentralisation	e.g. employee empowerment to understand and match e-complainers psychographic, demographic and cultural needs
Comprehensiveness	e.g. communication clarity in message tone and content orientation
Accessibility	e.g. perceived online communication channel access; response speed
Human intensity	e.g. personalisation of e-complaint response, training of semantic e-complaint decoding strategies
System intensity	e.g. sophistication and depth of e-complaint feedback system and related e-knowledge management capabilities

the public orientation of complaint management systems and data mining by visualising and algorithmically defining information flows and communication content (Chen et al. 2012; Coussement and Vandenpoel 2008; Lin 2011). Moreover, industry-norms such as the ISO 10002 (the International Standard for Complaints Handling) have recently intensified research on the practical implementation of complaint management systems (Ang and Buttle 2011).

11 The e-Complaint Response Message

Based on sophisticated internal e-complaint management systems, the design of response messages involves three critical, inherent trade-offs: response speed, message tone and content orientation.

11.1 Response Speed

The response speed trade-off involves the choice between personal and automated response communication. Numerous studies indicate the superiority and positive effects of personalised feedback on e-consumers post-complaint evaluation (Smith et al. 2010; Song and Zinkhan 2008; Strauss and Hill 2001). However, at the same time, online communication seems to carry an inherent expectation of timeliness, i.e. instantaneous feedback which, if delayed, has negative consequences on customers' corporate responsiveness perceptions (Mattila and Mount 2003; Matzler 2005; Neale et al. 2006).

Despite the aforementioned current predominance of automated e-mail response communication strategies, recent studies on complaint classification systems and agent-based complaint profiling systems seem to indicate a trend towards a facilitated personalisation of response message e-communication (Galitsky et al. 2009; Sultan et al. 2008).

11.2 Message Tone

The second trade-off in e-complaint communication is based on the absence of contextual and visual influences such as tone of voice or non-verbal language. Hence, the linguistic framing of an adequate 'message tone' which appeals to complainers' state of mind becomes the core focus of an effective online response message (Coussement and Vandenpoel 2008). As aforementioned, persuasion psychology literature has long recommended and verified the effectiveness of encoding messages according to readers' potential attitude orientation, i.e. their general psychological disposition in forming an attitude (See et al. 2008). Crucially, scholars propose that a message may either be evaluated based on its cognitive (rational, informational) or affective (personal, belief-based) value (Clary et al. 1994; Rosselli et al. 1995). In a complaint context, both affect (e.g. anger about the disappointing consumption experience) and cognition (e.g. information about a complaint resolution) should be addressed according to the given type of complaint or corporate crisis (Breitsohl et al. 2010; Hareli et al. 2009; Liu et al. 2011).

The choice of a public e-complaint channel has been found to be an emotionally-focused coping behaviour (Grégoire et al. 2009; Schoefer and Diamantopoulos 2008; Wetzer et al. 2007) which suggests the use of emotionally-charged jargon and semantic personalisation techniques such as using 'emoticons' in response emails as well as references to previous communication exchanges (Song and Zinkhan 2008; Srivastava and Chakravarti 2009; Walther 2001; Wolfinbarger and Gilly 2003). Private e-complaints seem to be more problem-focused and hence responses may carry a tone that is factual with the provided information focusing on precise, measurable explanations (Gelbrich 2009; Kuo and Wu 2011; Schoefer and Diamantopoulos 2008). In line, cognitive fit theory—i.e. matching an information type with a complainer's information processing (i.e. 'decoding-') strategy—appears to create strong persuasive effects (Park and Kim 2008; Srivastava and Chakravarti 2009).

However, with regards to online complaint dialogues, it remains unclear whether observers emotionally identify with the complainer or cognitively evaluate the post-complaint exchange as part of their information-seeking process. A recent study by Chan and Cui (2011) on observers perceptions of negative e-WOM demonstrates that observers' dissatisfaction decreases when reading an attribute-based complaint and increases for experience-based complaints, which seems to additionally vary with observers' social comparison tendencies and product-evaluative orientations. As noted by Libai et al. (2010), this communication scenario needs further research to verify such effects when corporate e-complaint response messages are added.

11.3 Contentual Orientation

The third trade-off poses the question as to whether the complaint response content should be of an accommodating or rather defensive character and what remedy may be offered to complainers in this regard. Offline complaint management literature provides ambiguous results, as Ferrin et al. (2007) for instance demonstrate denial to be the best response in case of an integrity violation, whereas apologies seem to be superior in competence-based violations.

Complaint research on offering compensation rather than an apology in an offline context either shows no significant difference in the effectiveness between the two response strategies (Coombs and Holladay 2008) or highlights a complainer's culture to be the ultimate determining factor of which response is preferred (Wong 2004). In an online context, the relative effectiveness of both denial and apologetic orientations has been supported by van Laer and de Ruyter (2010) who stress the superiority of using a narrative message frame for either response. A different perspective is offered by Kasabov and Warlow (2010) who conceptually outline the benefits of disciplining e-complainers as part of reducing the costs of corporate service recovery management.

Nevertheless, a recent empirical study shows online apologies to be superior to offering compensation (Abeler et al. 2010). In line, an online apology leads to immediate appeasement and captures negative emotions before they manifest into attitudes and was thus found to restore brand equity, to increase complaint satisfaction and loyalty and to strengthen customer retention (Liao 2007; Lyon and Cameron 2004; Xie and Peng 2009).

Figure 4 provides a graphical illustration of the three trade-offs in framing e-complaint response messages.

12 e-Complaint Feedback Utility Evaluations

The final part of the e-complaint communication process puts the strategic focus back onto the e-complainer and more specifically the e-complainer's utility-evaluations regarding the received corporate feedback. At its core, an e-complainer's

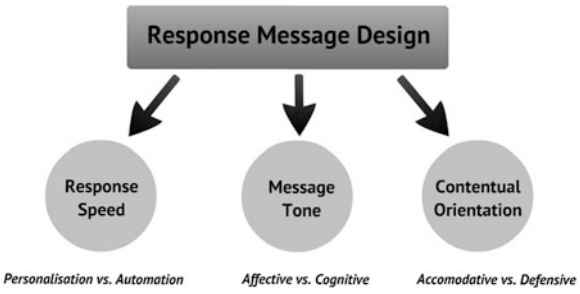

Fig. 4 Trade-offs in framing e-complaint response messages

utility evaluation process—i.e. to what extent the corporate response fulfils the original expectations of the complaint outcome—directly links back to the beginning of the communication cycle and may henceforth be divided into perceptual evaluations and behavioural consequences.

It is here suggested to adopt the long-established 'Theory of Justice'—resolving around Interaction, Procedure and Distribution—to model the perceptual evaluations of e-complaint feedback utility. In an online context, distributive justice is dominantly based on the contentual orientation (i.e. perceived fairness of redress) of electronic response messages, procedural justice on the aforementioned perceptions of timeliness and channel access, and interactional justice on the outlined evaluation of response message tone.

In addition, the importance of credibility perceptions in online environments has long been highlighted by communication scholars (e.g. Flanagin et al. 2000; Metzger et al. 2003; Wathen and Burkell 2002) and is consequently suggested to mediate the relationship between complaint utility and e-complainers' ultimate behavioural response (Breitsohl et al. 2010; Vázquez-Casielles et al. 2010). E-credibility crucially assesses the perceived trustworthiness and expertise of both the message and the source, whereas the latter—due to the lack of visual and verbal cues—may be less dominant in an e-complaint communication context (Brown et al. 2007). In relation, Bambauer-Sachse and Mangold (2011) highlight the significance of credibility in online complaint message evaluations, whereas both Doh and Hwang (2009) and Karmarkar and Tormala (2010) stress the superior influence of message content in contexts where information regarding the (corporate) communication source is limited. However, further research is needed in order to evaluate the determinants of e-complainer's credibility perceptions.

The behavioural outcome of perceptual utility and credibility evaluations is proposed to incorporate three focal constructs: satisfaction, WOM and repurchase intention (see Orsingher et al. 2009).

Complaint satisfaction describes the subjectively derived and emotionally predisposed evaluation of a company's complaint response message (Guo et al. 2009). In relation, the aforementioned recovery paradox promotes the idea that customer satisfaction after an adequate complaint response may actually be higher than at pre-complaint levels.

A second outcome—directly mediated by post-complaint satisfaction (Gelbrich and Roschk 2010)—is the communicative response of e-complainers which may involve positive e-WOM in form of praising the satisfactory complaint message or negative e-WOM in case of a dissatisfactory evaluation. In relation, Matos and Rossi (2008) demonstrate that negative e-WOM is less likely to occur as a result of dissatisfaction than positive e-WOM as a result of satisfaction.

Finally, a useful and credible complaint response can be expected to increase repurchase intentions which for most e-business complaint management communication strategies is the crucial performance metrics (Keiningham et al. 2007). In this regard, Holloway et al. (2005) propose online purchasing experience to crucially mediate the relationship between post-complaint satisfaction and repurchase

Fig. 5 e-complaint feedback utility evaluations and outcomes (based on Orsingher et al.'s (2010) SATCOM-model)

intention, where higher experience leads to greater likelihood of a repurchase (Fig. 5).

In comparison, literature on complaint observers' utility perceptions is rather limited. However, Breitsohl et al. 's (2010) recent study suggests that the less is known about an e-complainer, the more credibility is ascribed to the corporate response as its author's identity is known and may entail an assumed expertise (as a manufacturer or retailer of the product concerned).

In line, Hilton (1995) highlights the inherent uncertainty of conversational observers which tend to shift positive evaluations towards the communication participant who is perceived to be more knowledgeable. Moreover, online opinion-seekers who read about positive complaint resolutions may perceive less risk and cognitive dissonance (Miller et al. 2009). Finally, attribution theory suggests that if observers perceive the complaint to be inconsistent with their beliefs about the complaint issue at hand, a negative evaluation will be attributed to the complainer rather than to the corporate respondent (Herr et al. 1991; Hess et al. 2007; Laczniak et al. 2001).

13 Future Issues in e-Complaint Management

Considering the constantly increasing pace of communication media (e.g. Smartphones, Tablet devices, etc.), e-complaint management strategies require continuous research and technological adjustment in order to meet consumers' evolving needs. Two online communication phenomena have experienced particular scholarly attention: Negative electronic WOM (e-WOM) and semantic internationalisation.

13.1 Negative Electronic WOM

Corporate intervention in negative electronic WOM-conversations is a fairly recent communication strategy in response to the increasing power of communication platforms (e.g. Facebook, Review websites, etc.) and the discovered superior impact of negative- over positive e-WOM in consumer environments (Ahluwalia 2002; Marquis and Filiatrault 2002; Ryu and Han 2009; Yang and Mai 2010). As aforementioned however, negative e-WOM (unlike e-complaints) is not solution-oriented and more affect-based, which renders response communication strategies more sensitive and difficult. In fact, research indicates that there are varying levels of sensitivity and perceived privacy within online networks. Miller et al. (2009) for instance suggest that corporate response communication should take place selectively in relation to the number of participants in a given online forum and the degree of personal exchanges and quantity of relations within. Controversially, whereas Metzger et al. (2003) promote the benefits in credibility when companies interfere with consumer opinion statements, Dellarocas and Narayan (2006) show that corporate participation leads to scepticism and loss of credibility.

Yet, the necessity of dealing with negative e-WOM is indisputable. Zhu and Zhang (2010) for instance find negative word of mouth to be more credible than online corporate marketing efforts, regardless of how much is known about its author. In addition, online communication scholars report the significant impact of (negative) opinion-cascades within and between social networks (Watts and Dodds 2007). Consequently, Godes et al. (2005) promote a theoretical framework for further empirical studies which represents a continuum from passive to aggressive company interference strategies, as illustrated in Fig. 6:

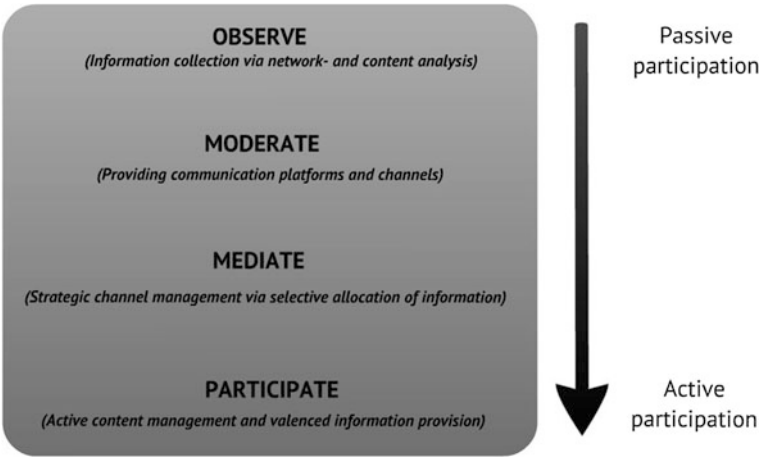

Fig. 6 Negative e-WOM company interference strategies adopted from Godes et al. (2005)

13.2 Semantic Internationalization

In relation to negative e-WOM, the observing WOM-readers and opinion-seekers are increasingly bilingual or even bicultural, which shifts the complaint communication focus on semantic e-management strategies. Corporate responses to e-complaints and negative e-WOM need to take into consideration that an international audience is likely to interpret a given communication process differently depending on their cultural and linguistic message decoding strategies (Luna et al. 2003, 2008; Noriega and Blair 2008). A Chinese consumer for instance may interpret a corporate e-complaint response as rude if it does not contain a degree of obedient and polite linguistic elements which may seem uncommon in Western communication cultures (Cheung 2010). However, in light of Schoefer's (2009) findings that cultural value orientation has little direct impact on post-complaint satisfaction (despite having definite moderation effects on justice perceptions and emotions), further research is recommended.

14 Managerial Implications

The managerial implications of the here proposed integrated e-complaint communication framework may be translated into three focal areas of application.

14.1 Integrated Communication Strategy

The inter-related nature and circularity of the e-complaint communication processes as exemplified in the model require consistency in both communication content and quality at every potential point of consumer contact. Consequently, it is recommended to implement ongoing internal marketing efforts in order to ensure a communication culture and complaint response philosophy that recognises the publicity and permanency of online communication. Specifically, every undertaken representational communication effort must be aligned to the overall goal of affirming complainers in their choice to voice their dissatisfaction and encouraging non-complainers to overcome their internal psychological barriers. Practical means to achieve this integration process may involve linguists or communication psychologists to ensure that online channels address the outlined preferences in the degree of publicity as well as adequate levels of transparency in corporate complaint policies in order to provide realistic expectations and henceforth positively influence consumers' complaint consideration set.

14.2 Systemisation of Complaint Response Messages

In direct relation to communication consistency, the utilisation of advanced operational complaint management systems allows the automation of complaint feedback messages. Social network and intelligent databases for instance may be used to create sophisticated psychological complainer profiles, which can then be combined with semantic content analysis tools to adequately match profiles to the attitude orientation, language intensity levels, content and tone of individual complaint messages. In addition, database systems may be used to collect and evaluate company-specific complaint behaviour, which over time will address the increasing expectation of personalised corporate communication efforts online. In relation, it seems advisable to integrate continuous performance metrics to measure the here suggested positive effects of sophisticated feedback on post-complaint satisfaction, repurchase intention and positive WOM.

14.3 Staff Communication Training Programmes

Finally, whilst the automation of IT-based complaint communication may address the linguistic optimisation of standardised feedback processes, human intelligence is recommended for communication tactics such as pro-actively approaching negative online opinion-leaders and public forums of specifically high strategic relevance. Next to the provision of internal communication training programs, more and more e-businesses employ communication psychologists and linguists in order to enhance the credibility and justice perceptions of individualised complaint responses to significant customers and potentially influential observers. Moreover, rhetorically and psychologically trained staff will be able to professionally address the increasing need for semantic internationalisation and proactive negative e-WOM interference strategies.

15 Conclusive Remarks

This chapter suggests nine critical strategic components to educate an integrated e-complaint communication framework for e-businesses. It thereby addresses the underresearched academic question of how the availability of new e-complaint channels has changed consumers' complaint behaviour and more importantly the components of adequate online complaint management and feedback message designs. Drawing on cross-disciplinary management, communication and psychology literature, the here proposed framework is the first of its kind to illustrate the interrelation between e-complainers, corporate responses and online observers from a holistic strategic perspective. As outlined throughout the sections, extensive

further research is needed to conceptually adjust and empirically verify offline complaint theories in the constantly evolving online communication paradigm.

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Developing and Validating a Multi-Criteria Model to Evaluate Mobile Service Quality

Emmanouil Stiakakis and Konstantinos Petridis

Abstract Even though electronic service (e-service) quality has been analyzed to a great extent, mobile service (m-service) quality still requires further investigation. The hierarchical and multi-criteria structure, which is adopted in this work, appears to be the most appropriate approach to define m-service quality. In the proposed theoretical framework, m-service quality is composed of three primary dimensions: (1) interaction, (2) environment, and (3) outcome quality. An overall view of m-service quality would propose *interaction quality* to include the sub-dimensions of expertise, problem solving, information, security/privacy, and customization/personalization, *environment quality* to comprise equipment, design, and context, and *outcome quality* to be composed of reliability, tangibles, and valence. In order to validate the proposed theoretical framework, each sub-dimension is further analyzed into a number of quality criteria by means of a number of experts. Following this method, the quality criteria are assessed through a survey conducted with a sample of mobile users. Using Principal Component Analysis (PCA) and Structural Equation Modeling (SEM), it is proved that the quality criteria were properly grouped into the sub-dimensions of the proposed theoretical framework. These findings entail that the sub-dimensions described in this paper are in fact the constituent parts of the m-service quality construct.

Keywords Mobile service · Mobile application · Service quality · Mobile internet

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1 Introduction

Quality of Service (QoS) is considered one of the most critical components for the success of an organization. The confirmed relationship of QoS with business performance, lower costs, customer satisfaction, customer loyalty, and profitability has motivated both researchers and practitioners to explore this concept (Seth et al. 2007). Delivering high quality service is considered a crucial strategy for business success (Zeithaml et al. 1996). In the past, the main emphasis of both managerial and academic attempts to define and make use of QoS was focused on developing strategies to meet customer expectations and understand electronic service (e-service) quality in terms of Web interactivity (e.g., Aladwani and Palvia 2002). Such approaches on measuring e-service quality by using indications that emerge from interacting with the website were found to be insufficient to measure the quality of the online service experience (Swaid and Wigand 2009). There is a need to go beyond the website interface in defining quality: a customer's online buying experience stretches through information search, product evaluation, decision making, carrying out the transaction, delivery, returns, and customer service (Wolfinbarger and Gilly 2003).

In order to deliver superior quality services, managers should first understand how customers perceive and evaluate e-service quality. To this end, many researchers produced studies in order to present models which, in general, are lists of dimensions of service quality delivered to users. In this context, the aim of this work is to develop and validate a reliable model for identifying the main components of mobile service (m-service) quality, i.e., the quality of all kinds of services delivered via mobile devices (mobile phones, smartphones, tablets, etc.).

2 Mobile Services

There are several types of mobile services that are accessible via a mobile device, namely the mobile Internet, SMS, MMS, email, chat, instant messaging, content services, customized infotainment, location based services, simple voice, rich voice, monitoring of RFID information, etc., (Bouwman et al. 2012; Olla and Patel 2002). The applications of mobile Value Added Services (mVAS) are divided into four categories (Coursaris et al. 2003): communication, entertainment, transaction, and information services. Mobile communication is a set of services such as SMS, MMS, and e-mail. Mobile entertainment comprises services such as the downloading of ring tones, images, and games. The combination of mobility and entertainment appears intuitively appealing to many customer segments as the users are offered the opportunity to enjoy themselves when wired entertainment appliances are inaccessible. Mobile transaction services provide users with business services such as shopping, banking, and mobile ticketing. Increasing the level of safety is likely to prove very beneficial to enterprises providing mobile

transaction services. Finally, mobile information services provide users with prompt information services such as breaking news, stock quotes, street maps, and parking space locations (Ahn et al. 2011). Another categorization of mobile services distinguishes between "push" and "pull" services; in the former the content is provided, while in the latter users have to search on their own for the relevant content.

3 Mobile Service Quality

With the rapid advancements of mobile network technologies, provision of various kinds of mVAS is on the rise around the world. As the market becomes more and more mature, mVAS become more homogenous and the competition to acquire new customers and retain existing customers becomes more intense. In this environment, customer satisfaction is a critical factor for mobile service providers to maintain or improve their market share and profitability. Earlier studies have concluded that customer satisfaction contributes to a firm's profitability and customer retention (Fornell 1992; Fornell et al. 1996).

Service quality is a multidimensional construct and many researchers have proposed lists of dimensions to capture the essence of this critical factor in influencing customer satisfaction. Several researchers have explored specific quality dimensions of services in the mobile environment. Some of the most significant models having been proposed are presented in Table 1.

Recent studies adopt the multidimensional approach for the assessment of m-service quality. For instance, Lim et al. (2006) identify five important dimensions of m-service quality: pricing plans, network quality, mobile data services, billing systems, and customer service. Cho and Sung (2007) introduce six dimensions to measure quality of mobile Internet services, including responsiveness, convenience, assurance, empathy, usefulness, and diversity. Their findings show that each dimension of m-service quality significantly influences customer satisfaction. Many studies have defined outcome quality as a dimension that affects the perceived service quality (Carman 1990; Fullerton 2005; Grönroos 1984; Rust and Oliver 1994). As research advanced, outcome quality emerged as one of the three primary dimensions of m-service quality (Brady and Cronin 2001) alongside interaction quality and environment quality. The term "interaction quality" refers to the quality of customers' interaction with the m-service provider during the service delivery. "Environment quality" describes how the service is effectively transmitted from service providers to users. The third dimension, "outcome quality", is similar to what Grönroos (1984) proposes as technical quality.

The mobile setting has indeed several particularities that influence service quality. There is, at least, a need for a proper mapping and interpretation of the quality dimensions identified in the electronic context. Chae et al. (2002) investigate m-service information quality considering information quality issues, as well as m-commerce characteristics such as context and mobile devices.

Table 1 Review of models for the assessment of m-service quality

Authors	Year	Field of research	Dimensions
Bouwman et al.	2012	Analysis of 48 mobile services	Usage context, efforts of users, innovativeness, usefulness, likelihood of use in five years
Zhao et al.	2012	Mobile value added services	Interaction quality, environment quality, outcome quality
Gummerus and Pihlström	2011	Estimation of the perceived value of a wide variety of m-services	Context value (time, location, lack of alternatives, uncertain conditions), in-use value (emotional value, esteem value, monetary value, convenience value, performance value)
Liu et al.	2011	Mobile phone users	Although dimensions are not defined, it is confirmed that m-service quality has a positive effect on satisfaction and trust, which in turn have a positive effect on loyalty
Vlachos et al.	2011	m-Services in different national settings	Efficiency quality (ease of use, usefulness), outcome quality (content variety, aesthetics), customer care quality (customization, privacy, customer service)
Lu et al.	2009	Brokerage mobile services	Interaction quality (attitude, expertise, problem solving, information), environment quality (equipment, design, situation), outcome quality (punctuality, tangibles, valence)
Chen and Aritejo	2008	Assessment of mobile value added service quality	Tangibles, reliability, responsiveness, assurance, empathy
Vlachos and Vrechopoulos	2008	Music mobile services	Content quality, contextual quality, device quality, connection quality, privacy
Cho and Sung	2007	Service quality and user satisfaction of wired and mobile Internet	Responsiveness, convenience, assurance, empathy, usefulness, diversity
Seth et al.	2007	Cellular mobile communications	Technical quality (customer perceived network quality), functional quality (reliability, responsiveness, assurance, empathy, tangibles, convenience), internal quality
Kar et al.	2006	Adapted e-services for synchronizing with mobile services	Reliability, responsiveness, user interface, trust, customization

(continued)

Table 1 (continued)

Authors	Year	Field of research	Dimensions
Lim et al.	2006	Winning strategies for mobile carriers	Pricing plans, network quality, mobile data services, billing systems, customer service
Huan et al.	2005	Chinese mobile telecommunication services	Service quality, customer value, customer satisfaction, and switching barriers are each found to have a direct effect on subscribers' loyalty
Yun et al.	2005	A survey on SMS, MMS, background image service, melody ring, ring back tone, games, location based services, video on demand	Sound quality, play time, download time, image quality (including image continuity)
Kim et al.	2004	Korean mobile telecommunication services	Call quality, value added services, customer support (factors having a significant impact on customer satisfaction)
Chae et al.	2002	Information quality of mobile services	Connection quality, content quality, interaction quality, contextual quality
Chalmers and Sloman	1999	Multimedia applications	Timeliness, bandwidth, reliability, priorities, perceived QoS (picture, audio, and video quality), cost, security
Singh	1996	Mobile phone users	Guarantee of seamless communication, graceful degradation of services (factors unique to the mobile setting)

They concluded that information quality for wireless Internet services depends on the following main factors:

- *Connection quality*: dealing with consumers having access to stable m-services without interruption of connection.
- *Content quality*: referring to the inherent value and usefulness of the information provided by m-services.
- *Interaction quality*: dealing mainly with the provision of easy and efficient m-services.
- *Contextual quality*: referring to the ubiquitous nature of m-services and personalization issues.

However, these four dimensions focus mainly on information quality rather than service quality. As already mentioned, researchers in the service quality area (Rust and Oliver 1994) also examine the *environment* as a critical factor which influences service quality. Moreover, according to e-service quality research (Wolfinbarger and Gilly 2003; Zeithaml et al. 2005) additional aspects of service quality -which are equally significant- are customer service and privacy/security.

In relative recent work (Vlachos and Vrechopoulos 2008), the authors investigate the theoretical and empirical meaningfulness of a composite model of behaviorial intentions in a pure mobile Internet services context. They suggest the dimensions of content quality, contextual quality, device quality, connection quality, and privacy.

In another study, Kar et al. (2006) adapt the quality dimensions of e-services (based on the SERVQUAL instrument) to fit characteristics of m-services. They identified five dimensions: reliability, responsiveness, user interface, trust, and customization.

Seth et al. (2007) propose that QoS in cellular mobile communication can be broadly categorized into technical and managerial parameters. Managerial parameters can be further categorized into functional and internal quality parameters. All the categories are equally important for the delivery of QoS to customers, but the authors underline that they are covered separately in the literature. Thus, the primary categorization of the QoS parameters is based on the segmentation in the literature pertaining to areas other than mobile communication:

- *Technical* parameters measure the network performance of cellular mobile communication network (e.g., call drop rate, network accessibility).
- *Functional* parameters measure how the service is delivered to the end customer.
- *Internal quality* parameters deal with the internal organizational dynamics. These parameters include top management commitment to quality, leadership, internal departmental communication, employee empowerment, etc.

Yun et al. (2005), conducting a survey on 8 different mobile services (SMS, MMS, background image service, melody ring, ring back tone, games, location

based services, and video on demand), propose the following four dimensions: (1) sound quality, (2) play time, (3) download time, and (4) image quality.

The primary purpose of the study by Huan et al. (2005) was to investigate the strategies of businesses in the Chinese mobile telecommunication services in order to increase customer loyalty. They present a rigid integrative model of subscribers' loyalty. Their analysis shows that service quality, customer value, customer satisfaction, and switching barriers have a direct effect on subscribers' loyalty.

In the same path, Liu et al. (2011) conclude that satisfaction, trust, and switching barriers have positive effects on loyalty. In terms of antecedents, it was found that playfulness and service quality affect satisfaction while service quality and intimacy affect trust. From a managerial perspective, this research suggests that practitioners should not only keep improving service quality, but also provide playfulness to ensure customer satisfaction.

A different approach is undertaken by Zhao et al. (2012), who suggest a research model that was based on a multidimensional approach that was empirically examined with data collected from about one thousand users of mobile value-added services in China. Results show that all three dimensions of service quality (interaction quality, environment quality, and outcome quality) have significant and positive effects on cumulative satisfaction, while only one dimension of service quality (interaction quality) has a significant and positive effect on transaction-specific satisfaction.

A significant approach is the study of Bouwman et al. (2012). This is one of the very few studies focused on mobile services, instead of just user perception and behaviour. The characteristics of 48 services under study are assessed according to the following five dimensions: usage context, efforts required by the users, innovativeness of the service, usefulness of the service, and likelihood of use in a period of five years. According to Gummerus and Pihlström (2011), context is an inherent part of service use experiences, which helps to understand when mobile services generate superior value-in-use for customers. In order to address this issue, a theoretical value framework incorporating context is proposed. The findings from a number of mobile service use situations indicate strong evidence for two types of value: context value and in-use value.

Finally, an approach which is also taken into account in the present study is that of Lu et al. (2009), who developed a multidimensional and hierarchical model to measure m-service quality. Their study proposes that m-service quality is composed of the three aforementioned primary dimensions, i.e., interaction quality, environment quality, and outcome quality. Each primary dimension is further analyzed into various sub-dimensions. Their model is empirically tested using data collected from a number of mobile brokerage service users.

4 Proposed Theoretical Framework

The proposed theoretical framework is a hierarchical, multidimensional model, structured in primary quality dimensions and their sub-dimensions. In order to define the primary dimensions, the perceived service quality model (Grönroos 1984) was adopted. This model is, along with the SERVQUAL instrument (Parasuraman et al. 1985), the foundation of most ongoing service quality research. According to the perceived service quality model, the quality of services has two basic dimensions: (1) the functional quality of the process (how the service is delivered) and (2) the technical quality of the outcome (what the customer receives). However, many researchers have adopted the proposition of Rust and Oliver (1994) that a third dimension, i.e., the environment of the service encounter, should be taken into account when evaluating the service quality. Indeed, the environment (physical or electronic setting, specific conditions under which the service is used, etc.) influences the perception of the service quality by the customer but it is part neither of functional nor outcome quality. Based on the above, the primary dimensions of the proposed framework for the evaluation of m-service quality are: (1) interaction quality, (2) environment quality, and (3) outcome quality. Interaction quality, which corresponds to the functional dimension of the perceived service quality model, reflects all the quality characteristics of a customer's interaction with the m-service provider. Prior research has shown that interaction quality has the most significant impact on service quality perception (Lu et al. 2009; Bitner et al. 1994). Environment quality is the quality of the context in which m-services are delivered, as well as quality characteristics of the equipment used in the m-service delivery. Compared to e-service settings, where the environment is not such a significant dimension, environment quality in the mobile setting plays a crucial role on how customers perceive the overall service quality. This difference is owed to the constraints of the equipment (screen size, battery capacity, etc.) and the unstable, in many cases, conditions under which services on the move are delivered. Outcome quality is the quality of everything provided (or left) to the customer at the end of the service delivery, such as evidence of the delivery, valence, etc. As it is obvious from the examples, it includes tangible as well as non-tangible elements. Many studies have shown that perceived service quality is also affected significantly by outcome quality (Fullerton 2005; Carman 1990).

Combining the findings from the literature review of Sect. 3, the primary dimensions of m-service quality have been further analyzed into sets of sub-dimensions. The motivation for this was to propose a hierarchical and multidimensional structure, which, according to the literature (see Sect. 3), has proved to be an indisputable approach to define the m-service quality construct. Interaction quality is proposed to be analyzed into the sub-dimensions of *expertise*, *problem solving*, *information*, *security/privacy*, and *customization/personalization*. These are quality dimensions drawn from the literature and related to how the service provider interacts with the user. A concise definition of the proposed sub-dimensions of the interaction quality follows:

- *Expertise* refers to the extent of the provider's knowledge regarding the service.
- *Problem solving* is the provider's ability to handle the user's problems promptly and effectively.
- *Information* pertains to the provision of accurate and precise information by the provider.
- *Security/privacy* refers to the protection of system and network resources from any external or internal attack and the protection of the users' personal data.
- *Customization/personalization* is the process of modifying services to suit the users' specifications/the process of providing services that are tailored to users (although this is not correct, sometimes the two terms are used interchangeably in the literature).

In order to justify the selection of the proposed sub-dimensions of interaction quality, some noteworthy citations are mentioned below: Brady and Cronin (2001) claim that expertise is a very important quality dimension ("providers should know all the details about their services"). Lu et al. (2009), Caro and Garcia (2007) include expertise and problem solving as basic sub-dimensions of service quality. Chae et al. (2002) highlight the importance of information, as customers want up-to-date, detailed, sufficient, and accurate information. Security and privacy are still issues with a very strong impact on m-service quality, despite the technological advances in network channels and devices. In this study, the importance of customization/personalization upon the delivery of m-service quality is also stressed. Mobile services and applications are increasingly becoming more personalized and customized, since this is the main point, apart from mobility, where mobile devices prevail compared to desktop computers. Customers should feel that the service delivery is exclusively for them, meeting only their requirements. In their studies, Vlachos and Vrechopoulos (2008), Vlachos et al. (2011) also suggest customization as a principal component of m-service quality.

Environment quality can be further analyzed into *equipment*, *design*, and *context*. These sub-dimensions are defined below:

- *Equipment* refers to the quality of both the wireless telecommunication network of the service provider and the mobile device of the user.
- *Design* refers to the quality of the mobile device's user-interface design.
- *Context* is related to the specific conditions under which the service is used.

Many authors, such as Lu et al. (2009), Vlachos and Vrechopoulos (2008), Caro and Garcia (2007), conclude that equipment is a crucial component of environment quality. Equipment does not only encompass the users' mobile devices, but also the wireless telecommunication network that the service provider uses. It has also been proved that the user-interface design, which is concerned with navigation, information visualization, etc., has a significant effect on m-service quality perception (Lu et al. 2009; Brady and Cronin 2001; Vlachos and Vrechopoulos 2008). Context is the most suggested sub-dimension of environment quality in the literature (e.g., Lu et al. 2009; Caro and Garcia 2007), since it is quite relevant to the

environment. Mobility causes, in many cases, unstable conditions of m-service uses, thereby making context a quality factor that has to be taken into consideration.

Finally, outcome quality is proposed to be analyzed into the sub-dimensions of *reliability*, *tangibles*, and *valence*. These are quality factors drawn from the literature and related to what is provided to the user upon the completion of the service. They are defined as follows:

- *Reliability* is the completion of the service in consistency with the provider's promises/guarantees.
- *Tangibles* are any kind of evidence that the service has been successfully delivered.
- *Valence* is the final impression of the user upon the completion of the service delivery.

The selection of the proposed sub-dimensions of outcome quality is justified below. Reliability is mostly related to the completion of the service on time, which is one of the most significant requirements on the user's end. Reliability can be assessed upon the completion of the service, when the user is able to evaluate the rate of the provider's consistency. This is why it is considered as an outcome of the m-service delivery. Chen and Aritejo (2008), Lu et al. (2009), and Seth et al. (2007) point out that the users perceive reliability as a very important component of service quality. It should be noted that Lu et al. (2009) use the term "punctuality" instead of the term "reliability". However, reliability has a much broader meaning and incorporates punctuality, which is limited to timely service delivery. Tangibles are definitely one of the sub-dimensions of outcome quality (Brady and Cronin 2001; Seth et al. 2007; Lu et al. 2009). The importance of tangibles arises from the fact that in a virtual setting the evidence of the service delivery is much more important than in the physical setting. The sub-dimension of valence is mainly based on the work of Caro and Garcia (2007), Lu et al. (2009). It is the user's final impression, the feeling of a good or bad experience that they get upon the completion of the service delivery. Valence is the quality factor that is mostly related to customer loyalty.

The proposed theoretical framework is depicted in Fig. 1.

5 Methodology

In the methodological part of this chapter, it was examined whether the eleven proposed sub-dimensions of the above theoretical framework are in fact the main components of m-service quality. This validation process was carried out by means of a survey conducted among m-service users. However, a direct evaluation of the eleven sub-dimensions of m-service quality could not be feasible, as the users who would participate in a survey could not assess terms such as "valence", "reliability", and "context". To address this issue, the eleven proposed sub-

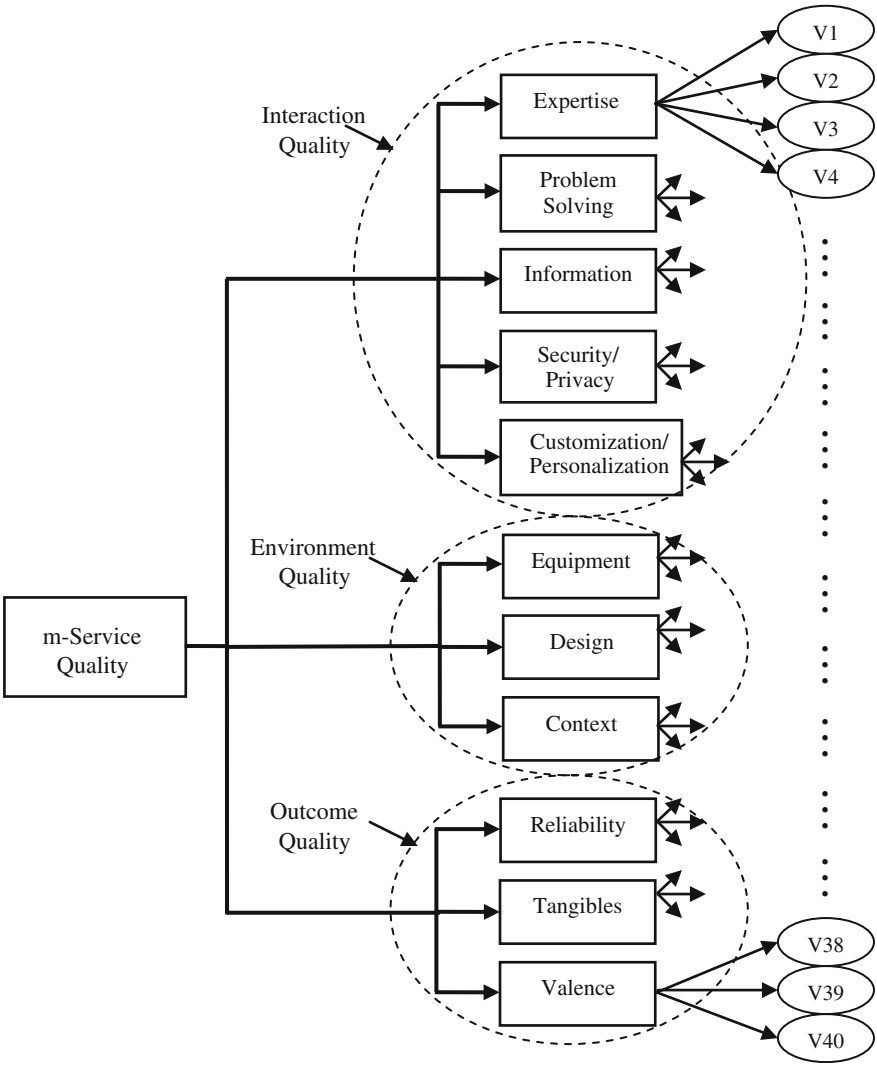

Fig. 1 The proposed theoretical framework for the assessment of m-service quality

dimensions were analyzed into 40 quality criteria (items). The analysis was accomplished by means of a number of experts. More specifically, six academics, whose main research topic is e-business technologies and services, were interviewed. According to the findings of that qualitative research, there was a consensus regarding the quality criteria that the eleven sub-dimensions of m-service quality are analyzed into. The forty quality criteria are summarized in Table 2.

The users who participated in the survey were asked to assess the importance of the 40 aforementioned quality criteria. The criteria were given as simply

Table 2 Proposed criteria for each of the sub-dimensions of m-service quality

Sub-dimensions	Criteria
Expertise	V1: Excellent service knowledge by the provider
	V2: The provider responds properly to the user's queries
	V3: The provider understands the user's needs
	V4: The provider understands that the user is based upon the provider's knowledge
Problem solving	V5: The provider is interested in the user's problems
	V6: Existence of a department dedicated to user support
	V7: Prompt solution of the user's problems
	V8: The provider understands the severity of a potential problem of the service
Information	V9: Accurate information by the provider
	V10: The user is notified about the precise service delivery time
	V11: The user's data are effectively processed by the provider
	V12: The provider knows the exact information needed by the user
Security/Privacy	V13: The user feels safe during the whole service delivery time
	V14: The provider owns a proper security certificate
	V15: The provider warrants the protection of the user's personal data
	V16: The user's personal data are used by the provider only after their consent
Customization/ Personalization	V17: Delivery of customized services to the user
	V18: The problems of the users are tackled on a case-by-case basis
	V19: Delivery of personalized information to the user
	V20: The expectations of individual users are met
Equipment	V21: Full exploitation of the possibilities of the telecommunications network
	V22: Full exploitation of the possibilities of the user's mobile device
	V23: The service is delivered at a high speed
Design	V24: High aesthetics in the user-interface design
	V25: Ease of use of the service
	V26: Directing the user via screens, forms, etc., when required
	V27: Simplification of the actions required by the user
Context	V28: Full exploitation of the location-based information of the mobile device by the service
	V29: Service operation in conditions of unstable connection
	V30: Service operation in conditions of decreased illumination/noise
Reliability	V31: Completion of the service on time
	V32: The user is notified of potential delays in the service delivery
	V33: The service can be cancelled/continued by the user if there is a delay

(continued)

Table 2 (continued)

Sub-dimensions	Criteria
Tangibles	V34: The user can print requested or produced items of the service
	V35: The user is provided with evidence for the successful completion of the service
	V36: Produced or requested items of the service can be sent to the destination selected by the user
Valence	V37: Interruption in the service delivery causes a negative impression to the user
	V38: The provider should undertake the cost of the interruption in the service delivery
	V39: Delivery of the service in the minimum possible time causes a positive impression to the user
	V40: The user has the feeling of a good experience upon the service completion

formulated sentences, so that the Likert scale could be used. The scale used five response categories: strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree. The sample used in the survey comprised 260 users of m-services without any bias regarding gender, age (over 15 years old), profession, and educational background. It should be noticed that the sample size was acceptable for factor analysis (the minimum sample size would have been 200, i.e., five times the number of variables). The survey was conducted in Northern Greece, in a two-month period through personal interviews and electronic mail messages sent to potential respondents. Since there were no differences between the two sub-samples, both methods of data collection were used to reach a satisfactory sample in a short period of time.

6 Research Analysis and Results

6.1 Factor Analysis Results

The purpose of conducting the survey previously described was to validate the proposed theoretical framework, and more specifically to certify that the forty quality criteria proposed by experts were properly grouped into the eleven sub-dimensions of m-service quality. These findings entail that the eleven sub-dimensions are in fact the main components of the m-service quality construct. In the context of that purpose, exploratory factor analysis was selected to be used. In factor analysis, it is important to see how much of a quality criterion's variance is shared with all the other quality criteria (variables). It was found that the values of all communalities (estimates of variables' common variance) were indeed high (Table 3). As a factor extraction method, Principal Component Analysis (PCA) was used. Nevertheless, the choice of the appropriate method was not of primary

Table 3 Communalities

Sub-dimension	Quality criteria (variables)	Extraction	Sub-dimension	Quality criteria (variables)	Extraction
Expertise	V1	0.682	Equipment	V21	0.752
	V2	0.715		V22	0.693
	V3	0.713		V23	0.636
	V4	0.737			
Problem solving	V5	0.684	Design	V24	0.656
	V6	0.698		V25	0.660
	V7	0.700		V26	0.644
	V8	0.737		V27	0.608
Information	V9	0.700	Context	V28	0.622
	V10	0.611		V29	0.762
	V11	0.676		V30	0.657
	V12	0.690			
Security/privacy	V13	0.572	Reliability	V31	0.629
	V14	0.728		V32	0.704
	V15	0.692		V33	0.713
	V16	0.610			
Customization/ personalization	V17	0.777	Tangibles	V34	0.659
	V18	0.553		V35	0.738
	V19	0.683		V36	0.645
	V20	0.571			
			Valence	V37	0.695
				V38	0.695
				V39	0.555
				V40	0.687

importance, since both component analysis and common factor analysis give essentially identical results when communalities exceed 0.60 for most variables (which was true in the present case).

Using exploratory PCA, eleven principal components were extracted with eigenvalues >1 (as is exactly the number of sub-dimensions of the proposed model). These components explain 67.5 % of the total variance in the 40 quality criteria of the survey. As shown in the component matrix (Table 4), illustrating the correlations between the variables and the corresponding component (loadings), eleven components were extracted. Therefore, it can be deduced that the 40 quality criteria were properly grouped into the eleven sub-dimensions of the theoretical framework which was proposed to delineate the m-service quality construct.

6.2 Structural Equation Modeling Results

In this section, the structural model is introduced and further examined. The reason for this analysis is to set a structure based on the hypothetical structures that PCA

Table 4 Component matrix

	Component										
	1	2	3	4	5	6	7	8	9	10	11
V1	0.608	–	–	–	–	–	–	–	–	–	–
V2	0.504	–	–	–	–	–	–	–	–	–	–
V3	0.501	–	–	–	–	–	–	–	–	–	–
V4	0.595	–	–	–	–	–	–	–	–	–	–
V5	–	0.488	–	–	–	–	–	–	–	–	–
V6	–	0.531	–	–	–	–	–	–	–	–	–
V7	–	0.498	–	–	–	–	–	–	–	–	–
V8	–	0.572	–	–	–	–	–	–	–	–	–
V9	–	–	0.613	–	–	–	–	–	–	–	–
V10	–	–	0.614	–	–	–	–	–	–	–	–
V11	–	–	0.546	–	–	–	–	–	–	–	–
V12	–	–	0.487	–	–	–	–	–	–	–	–
V13	–	–	–	0.464	–	–	–	–	—	–	–
V14	–	–	–	0.473	–	–	–	–	–	–	–
V15	–	–	–	0.507	–	–	–	–	–	–	–
V16	–	–	–	0.456	–	–	–	–	–	–	–
V17	–	–	–	–	0.460	–	–	–	–	–	–
V18	–	–	–	–	0.499	–	–	–	–	–	–
V19	–	–	–	–	0.557	–	–	–	–	–	–
V20	–	–	–	–	0.477	–	–	–	–	–	–
V21	–	–	–	–	–	0.463	–	–	–	–	–
V22	–	–	–	–	–	0.485	–	–	–	–	–
V23	–	–	–	–	–	0.493	–	–	–	–	–
V24	–	–	–	–	–	–	0.459	–	–	–	–
V25	–	–	–	–	–	–	0.501	–	–	–	–
V26	–	–	–	–	–	–	0.555	–	–	–	–
V27	–	–	–	–	–	–	0.490	–	–	–	–
V28	–	–	–	–	–	–	–	0.509	–	–	–
V29	–	–	–	–	–	–	–	0.503	–	–	–
V30	–	–	–	–	–	–	–	0.472	–	–	–
V31	–	–	–	–	–	–	–	–	0.546	–	–
V32	–	–	–	–	–	–	–	–	0.489	–	–
V33	–	–	–	–	–	–	–	–	0.517	–	–
V34	–	–	–	–	–	–	–	–	–	0.524	–
V35	–	–	–	–	–	–	–	–	–	0.460	–
V36	–	–	–	–	–	–	–	–	–	0.475	–
V37	–	–	–	–	–	–	–	–	–	–	0.533
V38	–	–	–	–	–	–	–	–	–	–	0.476
V39	–	–	–	–	–	–	–	–	–	–	0.448
V40	–	–	–	–	–	–	–	–	–	–	0.441

Extraction Method: Principal Component Analysis

created. An exploratory PCA can only provide general hypothetical structures, whereas it fails to provide outcome variables. For this reason, a structural equation modeling (SEM) technique is developed in order to confirm the overall structure of the model. As it can be realized from Fig. 1, a multicriteria second order structure is considered in order to confirm that the construct of m-service quality is common for all the criteria examined (Martínez-López et al. 2005). More specifically, the first order constructs are presented with rectangles while the items of each factor with an ellipse. The dashed line ellipses represent the three conceptual categories of m-service quality, as derived from the literature: "interaction quality", "environment quality", and "outcome quality".

M-service quality based on the suggested model exhibits all of these three covariated qualitative characteristics. As far as the first order dimensions are concerned, all three dimensions are reflected by 11 items (indicators) which co-vary and are interchangeable (Polites et al. 2012; Wright et al. 2012). The reason for choosing the reflective first and second order construct is due to the fact that each of the items cannot be viewed separately but in a common view (Coltman et al. 2008; Jarvis et al. 2003; Vlachos and Theotokis 2011). Under the formative conceptualization each construct is considered as separate and not interchangeable and thus does not fit in the examined model. Consequently, a model with reflective relations between the first and the second order constructs is adopted.

In order to evaluate the fit of the proposed structure, various indices are examined presenting a good or bad overall fit of the second order structure. The first set of indices concern the overall fit, while the second the incremental fit of the proposed model. Some of the measures used to examine the overall fit of the model are: the Normed Chi square (χ^2), the Goodness of Fit Index (GFI), the Root Mean Error of Approximation (RMSEA), the Adjusted Goodness of Fit Index (AGFI), and the Normed Fit Index (NFI). Current values of the indicators mentioned above and the acceptable cut-off values are given in Table 5. The suggested analysis was conducted using LISREL 8.80 software.

The results presented in Table 5 show an adequate overall good fit of the model. Besides testing and measuring the overall fit of the model, several tests regarding the reliability of each construct were also conducted. A good indicator for measuring a construct's consistency is Cronbach's alpha. A value above 0.9 indicates that the examined construct has a strong consistency. Another valid indicator for measuring a construct's consistency is that factor loadings, also known as λ,

Table 5 Overall, incremental, and parsimonious fit indices

Chi square (χ^2) = 1803.48, Degrees of Freedom (df) = 729, p value = 0.1102

Overall fit indices	Current value	Accepted value
Goodness of Fit Index (GFI)	0.901	>0.9
Root Mean Square Error of Approximation (RMSEA)	0.075	<0.08
Adjusted Goodness of Fit Index (AGFI)	0.9342	>0.8
Normed Fit Index (NFI)	0.902	>0.9
Normed Chi square (χ^2)	2.47	<3

Table 6 Loading estimates and reliability measures, Composite Reliability (CR), Average Variance Extracted (AVE), and Cronbach's alpha (α) for each construct

Construct (η)	Y	Loadings (λ)	Reliability measures	Construct (η)	Y	Loadings (λ)	Reliability measures
Expertise	V1	0.58	CR 0.81	Equipment	V21	0.41	CR 0.78
	V2	0.56	AVE 59 %		V22	0.67	AVE 69 %
	V3	0.83	α 0.87		V23	0.66	α 0.89
	V4	0.42					
Problem solving	V5	0.67	CR 0.86	Design	V24	0.56	CR 0.82
	V6	0.46	AVE 71 %		V25	0.79	AVE 57 %
					V26	0.47	α 0.85
	V7	0.59	α 0.90		V27	0.63	
	V8	0.63					
Information	V9	0.59	CR 0.85	Context	V28	0.56	CR 0.82
	V10	0.67	AVE 63 %		V29	0.78	AVE 75 %
	V11	0.44	α 0.87		V30	0.65	α 0.81
	V12	0.65					
Security/privacy	V13	0.78	CR 0.90	Reliability	V31	0.85	CR 0.92
	V14	0.56	AVE 56 %		V32	0.56	AVE 89 %
	V15	0.59	α 0.88		V33	0.85	α 0.94
	V16	0.71					
Customization/ personalization	V17	0.69	CR 0.93	Tangibles	V34	0.65	CR 0.79
	V18	0.56	AVE 81 %		V35	0.63	AVE 51 %
	V19	0.65	α 0.95		V36	0.48	α 0.96
	V20	0.66					
				Valence	V37	0.78	CR 0.87
					V38	0.69	AVE 61 %
					V39	0.56	α 0.89
					V40	0.71	

should receive values more than 0.7, while the component reliability (CR) and the average variance extracted (AVE) index should exceed 0.8 and 50 % respectively. In Table 6, the proposed reliability measures along with each factor loadings are presented.

According to Table 6, the constructs "security/privacy", "customization/personalization", and "reliability" seem to have a strong consistency due to high Cronbach's alpha values. Furthermore, as far as the construct's loadings to each item are concerned, all loadings seem to be in good levels except for V4 at "expertise", V6 at "problem solving", V11 at "information", V21 at "equipment", V26 at "design", and V36 at "tangibles". Regarding CR and AVE indices, it can be concluded that the constructs examined are well formed, as all values are above the accepted levels.

The first order structure has a convergent validity if the observed variables' loadings are significant on the corresponding factor (Kline 2011). The same is valid for the second order structure with regard to the relations between the exogenous (m-service quality) and the endogenous/latent factors ("expertise", "problem

Table 7 Final structure model with gamma coefficients and the corresponding statistical significance

Construct (η)	m-service quality (ξ)	Construct (η)	m-service quality (ξ)
Expertise	0.46*	Equipment	0.51*
Problem solving	0.41**	Design	0.57*
Information	0.55*	Context	0.43**
Security/privacy	0.62***	Reliability	0.68***
Customization/personalization	0.70***	Tangibles	0.40*
		Valence	0.51*

*$p < 0.05$ **$p < 0.01$ ***$p < 0.001$

solving", "information", "security/privacy", "customization/personalization", "equipment", "design", "context", "reliability", "tangibles", "valence"). In Table 7, the gamma values, namely the effects between the exogenous and the endogenous variables, are presented. As it can be seen, m-service quality has strong correlations to "security", "customization/personalization", and "reliability"; all three seem to have high importance due to high gamma. Furthermore, important constructs for m-service quality are "equipment", "design", and "information".

7 Conclusions

M-service quality is a multidimensional construct which is influenced by the service provider's awareness of the user's expectations and needs. The most crucial step to improve m-service quality is the identification of its constituent parts. This work aims at identifying the primary dimensions and sub-dimensions of m-service quality based on a detailed view of the relevant literature. In the proposed theoretical framework, the primary dimensions are: (1) interaction quality, (2) environment quality, and (3) outcome quality. Interaction quality comprises the sub-dimensions of expertise, problem solving, information, security/privacy, and customization/personalization. Environment quality includes the sub-dimensions of equipment, design, and context. Finally, outcome quality is proposed to be analyzed into the sub-dimensions of reliability, tangibles, and valence. The proposed model is validated through a survey conducted using a sample of various kinds of m-services users. Using PCA and SEM, it is certified that the quality criteria, which the sub-dimensions were analyzed into by means of a number of experts, were properly grouped into those sub-dimensions. Through SEM analysis, some important results are derived concerning the confirmation of the proposed model. Low values of loading estimates indicate a weak association between the specific item and the corresponding sub-dimension. As a second order structure is adopted, the effects between the exogenous variable (m-service quality) and the 11 endogenous variables are also of great interest. Based on the above analysis, it can be derived that m-service quality is mostly affected by "security/privacy",

"customization/personalization", and "reliability". The latent variables mentioned above reflect what m-service users would consider most important using a service of this type.

Comparing our findings with the findings of relevant studies, the following conclusions can be drawn: (1) the multidimensional approach in defining m-service quality, which is prevalently used in the literature, is also adopted in the present study; (2) the primary dimensions of m-service quality suggested in this study are in consistency with most of the prior studies using a hierarchical structure of m-service quality (irrespectively of the different names of the primary dimensions mentioned in the literature). In essence, these are a functional, a technical, and an environmental component of m-service quality; (3) concerning the sub-dimensions of the service quality construct, our suggestions are closer to the approach of Lu et al. (2009). At this hierarchical level, there are many discrepancies among the various models examined in this study (see Table 1), mostly due to the different fields of research; and, (4) a point that the present study also contributes to the theory is the list of the forty criteria into which the sub-dimensions were further analyzed. Our efforts focused on suggesting all the criteria that encompass every aspect of m-service quality.

The proposed theoretical framework is worth further investigation in view of the following reasons: (1) it can be used for all kinds of m-services, and is not limited to specific m-service types like brokerage, entertainment, etc., (2) it provides a comprehensive view of m-service quality since it efficiently analyzes the proposed dimensions into a detailed number of quality criteria, and (3) it incorporates all the significant aspects of m-service quality, such as security, customization, and valence, whereas most of the models and approaches in the literature focus on very specific dimensions. It would be very interesting, as a suggestion for further research, to compare the perspective of mobile users against that of service providers and designers with regard to the determinants of m-service quality and their relative importance.

8 Managerial Implications

M-service quality cannot be treated as a unidimensional construct. On the contrary, it is a multidimensional concept and its overall improvement depends on the improvement of each of its primary dimensions and sub-dimensions. This means that a business strategy aiming at m-service quality enhancement should be multidimensional as well. Service providers should allocate their resources based on the sub-dimensions which have the lowest performance at that particular time. If, for instance, the results of a survey show that design is a low quality criterion according to the respondents' perceptions, then designing a mobile device user-interface with better functionality, usability, and aesthetics should be a high priority business plan. Service providers and designers of mobile services and applications should be aware of the overall structure of m-service quality, i.e., the

identification and hierarchy of the quality factors which constitute the m-service quality construct. Investing on the improvement of false factors is simply a waste of time, efforts, and available resources. So far, there have been many occasions where managers involved in designing m-services omitted, in their business initiatives, very important quality factors. Providing standardized m-services instead of modifying those services to the users' preferences and specifications was such a managerial fault. Managers usually perceive service quality in a different way than the users, as the managerial perspective is primarily interpreted in financial terms. But quality is always defined according to the users' perceptions. The awareness of the primary dimensions and the sub-dimensions of m-service quality, as well as the quality criteria that those sub-dimensions were further analyzed into, could help managers to prioritize their initiatives successfully, reduce risks arising from wrong priorities, and increase customer retention.

In this paper, a hierarchical structure of m-service quality is presented. M-service quality is analyzed into primary dimensions, sub-dimensions, and finally into a detailed number of criteria. In that way, designing and improving m-service quality will not be any more a vague process but, on the contrary, it can be a process focused on very specific actions. Managers who deal in the design and improvement of m-services will be able to understand exactly what the constituent parts of the service quality construct are. According to our analysis, m-service quality is primarily influenced by security/privacy, customization/personalization, and reliability. Improving, for instance, reliability means (1) completing the service on time, (2) notifying the user about potential delays, and (3) giving the user the possibility to cancel or continue the service if there is a delay (see Table 2). In fact, these are the steps needed to be taken in order to better design or further improve the "reliability" characteristic of m-service quality. Consequently, dimensionality of m-service quality provides both a general and analytical view of that construct and enables managers to effectively determine their actions in designing and improving m-services.

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Corporate Disclosure Strategies on Company Websites: Reviewing Opportunistic Practices

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Abstract This work reviews and illustrates potentially misleading disclosure practices which may respond to opportunistic management behavior. We focus on press releases announcing annual earnings posted on company websites. The complexity of corporate communication practices has increased over time providing users with elaborate reports including detailed information on company annual results. Additionally, companies also issue press releases summarizing the annual results. These press releases are essential for a firm's disclosure strategy, and are accessible to investors and the general public through company websites and news wire services. They are fundamental for a timely presentation of a firm's performance, potentially influencing the perceptions of the reader. The negative aspect of these press releases is that their content is unregulated, and managers can select and present the information in a misleading way. Our objective is to identify the strategies used to do so. The practices analyzed in this work are subtle techniques which may not be easy to detect. The identification of these practices is relevant for the different parties involved or those affected by corporate disclosures. Decisions taken using this potentially biased information is likely to have an effect on the efficient allocation of economic resources. Therefore, the contribution of this research is important and relevant in order to extend corporate communication research.

Keywords Impression management practices · Corporate websites · Online financial press releases · Disclosure strategies

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1 Introduction

In this chapter, we review the evidence of managers' discretionary disclosure practices in Internet (i.e. corporate websites) press release earnings announcements (PREA). Prior research has considered the use of the Internet as an important information dissemination tool (Dewally 2000; Wysocki 1998) and has provided evidence of its impact on users' trading behaviour (Chan et al. 2005). In general, the Internet allows a large number of users to access corporate information which was previously available only to sophisticated users such as institutional investors, analysts or other financial experts. The Internet has brought about a change in the information environment by facilitating and lowering the costs of provision of information. This is expected to lead to less information asymmetry by helping management to make mandatory (i.e. annual reports) and voluntary (i.e. PREA) disclosures available to market participants. Voluntary disclosures are essential within corporate communication strategy. They are defined as "disclosures in excess of requirements, representing free choices on the part of company management to provide accounting and other information deemed relevant to the decision needs of users of their annual reports" (Meek et al. 1995, p. 555). Voluntary disclosures reduce information asymmetry by decreasing the agency or contracting costs (Chow and Wong-Boren 1987), diminishing the firm's capital cost (Botosan 1997; Sengupta 1998) and enhancing the firm's value (Graham et al. 2005; Verrecchia 1983). Managers can also use these voluntary disclosures as self-serving disclosures or impression management tools.The improvements in technology, and in particular the Internet, allow market participants to access vast amounts of timely accounting and non-accounting information cheaply. Ahmed et al. (2003) suggest that online trading availability has increased the proportion of naïve investors in the market. Investors' ability to use the information available is also a concern, with the possibility of cognitive bias potentially affecting these naïve users.

With its origin in psychology, the concept of impression management is concerned with the study of *how individuals present themselves to be perceived favourably by others* (Hooghiemstra 2000). In the corporate reporting context, impression management occurs when management selects and presents the information in a manner that distorts readers' perceptions of corporate achievements (Neu 1991; Neu et al. 1998). Managers have been accused of using annual reports as marketing tools to enhance perceptions of corporate performance or to understate negative news (Subramanian et al. 1993). From this perspective, management uses corporate narrative disclosures to present a self-serving view of corporate performance rather than providing a balanced account of their stewardship.

There are two opposing explanations concerning voluntary disclosure research. The first establishes that additional disclosures are provided by managers to present useful incremental information to investors. As such, disclosures may well be unbiased. The second view assumes that managers use impression management within voluntary disclosures opportunistically to present a self-serving view of corporate performance. In this work, we follow the self-serving disclosure view.

An extensive literature review of narrative disclosures by Merkl-Davies and Brennan (2007) shows that the majority of papers testing these two theories find support for the self-serving motivation. When discretionary narrative disclosures are used for opportunistic impression management rather than incremental information purposes, financial reporting quality is undermined. Managers' engagement in impression management may result in adverse capital allocations if users are susceptible to it, as demonstrated in prior literature (e.g. Davis et al. 2012). Since impression management has the potential to impair the quality of financial reporting, it constitutes an important area of research.

Impression management has generally been studied in chairmen's reports and letters to shareholders in annual reports. It is only relatively recently that narrative disclosure practices in press releases have been examined, including quarterly earnings announcements (see, e.g., Bowen et al. 2005; Davis et al. 2012; Henry 2008; Johnson and Schwartz 2005), press releases announcing accounting restatements (Files et al. 2009; Gordon et al. 2010; Henry 2008), and earnings press releases (Brennan et al. 2009; Garcia Osma and Guillamon-Saorin 2011; Guillamon-Saorin et al. 2011; Guillamon-Saorin and Martinez-Lopez 2013; Henry 2008). Moreover, prior studies tend to examine impression management practices individually. Seven impression management techniques have been studied in earlier literature (Merkl-Davies and Brennan 2007). This study examines five of the less-researched methods of impression management practices, including thematic manipulation or disclosure tone (manipulation of good and bad news disclosures), emphasis (location, repetition and reinforcement of information), performance comparisons (using benchmarks), selectivity (choice/selection of performance number) and attributional bias.[1]

The focus of this work is earnings press releases posted on company websites. Managers distribute disclosures via various communication channels including press releases, conference calls and annual reports. Overall corporate disclosure strategy considers the timing, form and visibility of the alternative disclosure outlets (Davis and Tama-Sweet 2012). Managers value outlets that reach a wide audience for their corporate disclosures especially if the intention is to make a first positive impact on readers. Prior research states that "the benefits of financial information increases with the dissemination of the accounting data through various communication channels such as the financial press, radio, television and the Internet",(Bushman and Smith 2001: 307). Readers of Internet press releases make their decisions based on the information provided in headlines (Zillmann et al. 2004). Access to PRAE within the company website is via the headlines. PRAE are listed by headlines on the "investor relations" tab of a company websites, and the reader can click on the link (usually the headline itself) to access and read the whole press release. Therefore, headlines play an important role within the corporate communication strategy and managers consider them to be a framing feature to capture and retain attention probably with the intention of affecting the

[1] We focus on thematic techniques and exclude from our analysis syntactic-related practices.

thoughts and feelings of readers (Guillamon-Saorin et al. 2011; Guillamon-Saorin and Martinez-Lopez 2013). Earnings press releases are the most visible and timely outlet for managers to communicate corporate information, and earnings performance in particular. PREA are a prized communication outlet for managers to communicate with investors because, among other reasons, they can be released earlier than the annual report (Jopson 2007).[2]

Companies' traditional paper-based annual reports are no longer able to compete with electronic-based information as a reliable source to support timely, dynamic investor decisions (Ettredge et al. 2002; Sasongko Budisusetyo and Spica 2011). Providers and users of information value the convenience of electronic sources despite the negative aspects associated to these venues (Doherty et al. 2011; Etsebeth 2011; Moradi et al. 2011; Pollach 2011). The Internet-based financial press release summarising annual corporate performance is seen as the most important news event for investors, financial media and other participants in the stock market (Athanasakou and Hussainey 2010; Koretto 1997; Mahoney and Lewis 2004).

The negative element of this information package is that the flexibility of the Internet context for designing corporate financial disclosures increases the potential for less reliable business reporting (Athanasakou and Hussainey 2010; Ettredge et al. 2001). The reasons leading to this negative scenario include the expansion of online audiences interested in companies' financial information; the users' perceptions of self-confidence and control related to the cognitive processing of information in a computer-mediated context (Hoffman and Novak 1996); and the growing number of inexperienced online investors who trade at their own risk instead of using the services of professional brokers to place stock market orders (Barber and Odean 2001). This means that non-sophisticated investors may be basing their decision-making investment processes on low-quality online information, thus reducing efficiency in resources allocation (Barber and Odean 2001).

2 Background

2.1 Regulatory Framework

It is fundamental for accounting that an unbiased, objective picture of a firm's performance is portrayed in financial statements, but there are no explicit rules or guidance from the Stock Exchange regarding press releases in the US or Europe (Davis and Tama-Sweet 2012). However, there are general requirements

[2] The content of the annual reports is usually highly sophisticated, including graphs, tables and pictures. However, press releases have a simplistic format mostly formed of narratives and rarely including tables that summarize the results in quantitative form.

documented in most Stock Exchange regulations. For example, the International Accounting Standards Board (IASB) requires that financial "*information must represent faithfully the transactions and other events it either purports to present or could reasonably be expected to represent*" [International Accounting Standard Board (IASB) 2001 paragraph 33]. Also, in the UK, rules 9.1 and 9.2 of The Listing Rules of the London Stock Exchange (Financial Services Authority 2002) establish that companies must notify the regulatory information service without delay of any price-sensitive information disclosed that is not public knowledge. Further, listed companies must ensure that any information they disclose to the market is complete and not misleading, false or deceptive (Rule 9.3A of The Listing Rules). This general rule also applies to voluntary disclosures (e.g., press releases).

Impression management in communications of financial performance and position conflicts with the fundamental objective of financial reporting, which is to present financial performance fairly, in a neutral and unbiased manner (Beattie and Jones 2000b). The unregulated nature of press releases makes them a potential vehicle for impression management. Press releases are so broadly distributed that their message reaches a large audience. They are voluntary, released by companies to the market (i.e., to print, audio and visual media, shareholders, wire services, etc.) even though not required by law or regulations. As the content of press releases is largely unregulated, managers can provide investors with information that does not appear in the annual report. One such example that has received particular attention from regulators and researchers in recent years is the disclosure of novel measures of performance (e.g. *pro form* earnings). These amounts are typically different from the metrics described, for example, in accounting standards, and therefore provide managers with a tool to exercise their discretion and the opportunity to introduce biased information.

2.2 Importance of Studying Narrative Disclosures

Companies are continuously looking for efficient systems to circulate their yearly earnings summary and to make the first communication of the year to shareholders as impacting as possible. Annual reports, and financial statements in particular, are declining in value-relevance (Francis and Schipper 1999) and their usefulness is limited by shareholders' difficulties in understanding them (Institute of Chartered Accountants of Scotland (ICAS) 1999). Bartlett and Chandler (1997) find that full annual reports are read thoroughly by only 10 % of shareholders, read briefly by 63 % and not read at all by 27 %. Accordingto a discussion included in the Financial Times, related to corporate reporting issues, share prices are more likely to be affected by the content of earnings press releases than by financial accounts (which take longer to read and are more difficult to interpret) or by annual reports (which take longer to arrive) (Jopson 2007). As a result, other vehicles used by managers to convey information to shareholders (such as websites, press releases,

etc.) are increasing in relevance and usage (Bushman and Smith 2001). The unregulated nature of earnings press releases makes it easier for managers to manipulate the information disclosed therein. The crossover between financial reporting in annual reports which is highly regulated, and its dissemination to corporate stakeholders through a non-regulated medium offers a potentially rich research opportunity in impression management. An important element of this information package is the language used in the earnings press release, which provides the unifying framework within which earnings are announced and other quantitative and qualitative disclosures are made. Evidence in academic research demonstrating the information content of disclosures made in earnings press releases includes numerical disclosures (Huang et al. 2012; Kothari 2001) and narrative disclosures (Davis et al. 2011, 2012; Francis et al. 2002; Hoskin et al. 1986) or both (Brennan et al. 2009; Garcia Osma and Guillamon-Saorin 2011).

Managers include information from financial statements in press releases, such as information on current operating data, and on non-recurring earnings components. Broadening the disclosure of earnings announcements in press releases (documents that are similar to ARPR) increases their usefulness (Francis et al. 2002). Moreover, Hoskin et al. (1986) find that earnings press releases often convey other information (besides bottom line amounts) that largely explains the market reaction to earnings announcements.

Prior literature has documented the potential impact of information disseminated through the Internet on investors (Chan et al. 2005). Given that press releases are used to submit more timely information to the market, in particular information posted on the company website as an immediate disclosure after the event occurrence, this investigation is a relevant contribution to the literature. Prior research has shown that investors react to the format and content of these releases (Davis et al. 2012; Files et al. 2009; Henry 2008). For example, Davis and Tama-Sweet (2012) find that firms exhibit significantly lower levels of pessimism in earnings press releases compared with Management Discussion and Analysis documents.

Considering that PREA are among the most common and widespread disclosure vehicles used by companies (Lang and Lundholm 2000), the reliability and accuracy of the disclosures included in them are of the utmost importance to the proper functioning of capital markets.

3 Theoretical Basis and Impression Management Practices

Prior impression management research is primarily based on agency theory although signalling theory (Rutherford 2003; Smith and Taffler 1992), institutional theory (Bansal and Clelland 2004), stakeholder theory (Hooghiemstra 2000) and legitimacy theory (Hooghiemstra 2000; Ogden and Clarke 2005) have been invoked in a minority of studies to explain impression management. This research takes a traditional agency theory perspective and argues that managers behave in a self-interested manner.

Disclosure bias is defined in this research as deliberate misrepresentation of firm performance by managers. In relation to narrative disclosures, the IASB (2007 paragraph 55) implicitly acknowledges bias in this format of financial reporting by observing that "*management commentary requirements would also impose a discipline for management to report in a more balanced, unbiased way*". Fisher and Verrecchia (2004) argue that management framing of disclosure with a positive spin may be regarded as transparent disclosure (i.e. that users can easily see through the bias). They try to explain why disclosures with transparent bias persist. They acknowledge two explanations from the prior literature for transparent bias. (1) Investors respond heuristically to bias and are fooled by those activities; and (2) contracts are contingent on disclosures and do not adjust for transparent manipulations of those disclosures. Fisher and Verrecchia (2004) put forward a third explanation for transparent bias implying that managers believe what they disclose.

The study of impression management in the accounting literature has mainly covered accounting narratives but also other disclosure methods such as graphs (for example, Beattie and Jones 1992; Beattie and Jones 1997, 2000a, 2001; Mather et al. 1996) and pictorial illustrations (for example, Anderson and Imperia 1992; Graves et al. 1996; Preston et al. 1996; Preston and Young 2000; Rivelli 1984). Impression management in accounting narratives has been analysed using a variety of methods (for example, disclosure indices and thematic and syntactic content analysis). While studies based on indices have focussed on the analysis of the quality and quantity of information included in company reports, thematic and syntactic content analysis studies have addressed the study of the stylistics of accounting narratives and also manipulation of information. Both of these approaches are subsets of content analysis but they have different objectives. Jones and Shoemaker (1994: 143) define these objectives as follows: *'The objective of thematic analysis is to extract and analyse themes inherent within the message. The objective of syntactic analysis is to analyse and quantify the cognitive difficulty of reading the message'.*

This study examines and illustrates[3] five methods used in impression management practices, including thematic manipulation, emphasis, performance comparisons, selectivity and attributional bias in PREA posted on company websites.

3.1 Thematic Manipulation (or Disclosure Tone)

Definition and background. Thematic manipulation entails emphasising positive words while downplaying negative words, themes or amounts. Abrahamson and Park (1994), Abrahamson and Amir (1996), Smith and Taffler (2000) and Clatworthy and Jones (2003) classify words used in corporate financial reports into

[3] Illustrations are based on real information from PREA.

positive and negative keywords. Lang and Lundholm (2000) analyse statements by type (performance, management spin, forward looking, other). They also categorise disclosures by tone (optimistic, pessimistic), as do Davis et al. (2012) and Henry (2008). Recent papers have also defined disclosure tone in relation to quantitative information. For example, a company may disclose amounts in its press release that paint a better picture than the real underlying financial situation (Brennan et al. 2009; Garcia Osma and Guillamon-Saorin 2011).

Method. Press releases are analysed for evidence of positive and negative themes and amounts. Keywords and statements in PREA which imply a performance outcome for the firm are the units of analysis. These are classified into positive and negative depending on the performance outcome implied (Abrahamson and Amir 1996; Brennan et al. 2009; Clatworthy and Jones 2003). In addition to the analysis of keywords and statements, quantitative performance amounts (e.g., profit) are categorised as positive or negative by reference to results the year before. If the amount is higher than the previous year then it is deemed positive, otherwise it is considered negative.

Illustration. The example "Group turnover *up* 7 % to £456 million" illustrates a positive statement indicating positive results ("turnover up"). The word "up" is a positive keyword[4] thus rendering the headline positive. A negative outcome in the following example, "Headline profit before tax *down* 6 % to £24.7 million", shows a decrease in pre-tax profit. The negative keyword "down" attributes a negative connotation. Both examples include qualitative and quantitative information.

3.2 Emphasis—Visual and Structural Manipulation

Three ways in which narrative disclosures can be presented from a visual or structural point of view presented in prior research include: (1) Ordering or physical location of information; (2) Repetition; and (3) Reinforcement. This is the first time that reinforcement as an impression management technique has been empirically tested.

3.2.1 Ordering/Emphasis by Location of Information

Definition and background. Staw et al. (1983) examine the "art of presenting good and bad news" by reference to their location in presidents' letters to shareholders. Disclosures were assigned one of five location numbers representing a hierarchy of prominence. They find that high-performing companies release positive news and keep it in a prominent position throughout the entire document

[4] Positive and negative keywords are based on prior literature (Abrahamson and Park 1994; Brennan et al. 2009; Clatworthy and Jones 2003).

whereas low-performing companies release bad news at the beginning and then use the remainder of the corporate document to emphasise good news. In an experiment with MBA students, Baird and Zelin (2000) examine whether the ordering of news biases investor perceptions. They find that subjects were more influenced by information read first in the president's letter.

Bowen et al. (2005) consider the emphasis/positioning of *pro forma* earnings and use two measures: emphasis and relative emphasis. Emphasis is measured by using four positions for disclosing *pro forma* earnings– headline, first/second paragraph, further down in the body of the press release, or in the financial statements appended to the press release. The positioning of earnings calculated according to Generally Accepted Accounting Principles (GAAP) is also measured. Relative emphasis is the importance of the positioning of *pro forma* versus GAAP earnings. They find that firms emphasise metrics that are more value-relevant and that portray more favourable firm performance.

Elliott (2006) operationalises emphasis by whether the earnings number is disclosed in the headline of the press release, or whether discussion of *pro forma* or GAAP earnings comes first in the press release. In an experiment with professional (analysts) and non-professional (MBA students) investors, they find that the location of *pro forma* earnings, and not just their disclosure, influences non-professional investor perceptions and investment decisions. Elliott (2006) concludes that inexperienced investors are more easily misled by impression management than professional investors.

Recent research has analysed potentially misleading disclosure practices in the headlines of press releases posted on company websites (Guillamon-Saorin et al. 2011; Guillamon-Saorin and Martinez-Lopez 2013). Evidence shows that headlines are used as strategic instruments where managers place the most favourable information about the company.

Method. Emphasis by location is defined as the emphasis provided by prominent location (e.g., heading and subheadings), special characters (e.g., bullet points), type of font (e.g. bold, italics, underlining), or a combination of two or more of these. However, press releases are not bound by standards of presentation and come in many different formats, for this reason the researcher must exercise judgement. Three levels of emphasis by location or ordering within the document are defined: most-, next most- and least-emphasised. These are based on where the information is located within the press release. This methodology is adapted from prior literature (Bowen et al. 2005; Brennan et al. 2009; Staw et al. 1983). The headline, if present, is the most-emphasised section of the press release. The basic idea is that text that features early in press releases is given greater emphasis simply because it comes first. Paragraphs one and two are considered to be the most emphasised, paragraphs three and four are the next most emphasised, and information after paragraph four is considered the least emphasised.

Illustration. Positioning or emphasis by location may occur when the information being disclosed is positioned within the press release depending on whether it is positive or negative. A company might want to include negative information in a less prominent location while emphasising the positive news in the most

prominent section of the PREA. For example, a company announcing the positive statement in the headline "Strong *growth* in contract logistics" followed by two statements containing negative outputs in the main body of the document, "Profit *reduction* in Storage & Distribution due to first half *decline* in cold store utilisation", and "Overall, headline profit before tax *down* 6 % to £24.7 million", indicates a disclosure strategy in line with emphasis by location. In the first statement, the keyword "growth" adds a positive connotation to the information provided. In the last two statements the keywords "reduction" "decline" and "down" give a negative connotation to the information content.

3.2.2 Repetition

Definition and background. Courtis (1996) first studied what he called "redundancy" (i.e., repetition) in annual reports. He found relatively low levels of repetition and concluded that redundant voluntary disclosures had not yet reached levels which either systematically reinforced important matters or overloaded users with too much information. Repetition in the context of PREA is not efficient because these documents are short (on average, 2 pages) and managers need to maximize the content by mentioning as many different issues as possible rather than repeating[5] the same information. This strategy is considered potentially misleading and the intention is probably to make this information more salient to readers.

Method. Repetition of statements occurs when the same statement is repeated more than once in the press release. This technique can be misleading for two reasons: (1) the press release is a short document (two pages, on average) and the repetition of the same issue more than once can cause the reader to focus on that specific issue while diverting attention from other issues in the press release, and (2), this practice can be misleading if the manager repeats positive information but not negative, or vice versa.

Illustration. The following three sentences are included in the same PREA and refer to the same issue although stated in different terms. "The group records net profit of 1,805 million euro, a gain of 16.4 %", "Attributable net profit of 1,805", "The group recorded a total net profit of 1,805 million, 16.4 % more than in the previous year despite the difficult macroeconomic environment".

3.2.3 Reinforcement

Definition and background. Reinforcement is a way of adding emphasis to a piece of information making it more salient to the reader. This technique has only been defined by Brennan et al. (2009).

[5] The same issue may be repeated up to four times in some press releases, as documented by Brennan et al. (2009).

Method. Reinforcement of keywords occurs when a qualifier is included to emphasise the positive or negative connotation of the keyword.

Illustration. For example, in the following statement "strong" reinforces the positive connotation of "growth", "*Strong growth* in contract logistics".

3.3 Performance Comparisons

Definition and background. A performance comparison is a benchmark or comparative data item accompanying a number that allows the reader to assess whether performance has improved or deteriorated. If the benchmark or comparator is low, current period performance will appear favourable. In a study of company stock returns disclosed in corporate proxy statements, Lewellen et al. (1996) find that low benchmarks were chosen which generated enhanced stock return performance comparisons. The selection of benchmarks was biased. They conclude that this indicates that management engages in self-serving behaviour. Similarly, Schrand and Walther (2000) find that managers select prior period benchmarks that result in the biggest increase in earnings. They find that investors use the benchmark to evaluate earnings. Cassar (2001) finds that better-performing firms are more likely to include comparator share performance graphs voluntarily. This, together with choice of comparisons in graphs, resulted in 87 % of firms showing better performance than the comparisons disclosed. Short and Palmer (2003) find that CEOs of large, strongly performing and new companies use more external performance referents than CEOs from small, poorly performing and established firms.

While the study of investors' use of these disclosures is outside the scope of this research, it is worth noting that Krische (2005) provides further evidence that the choice of benchmark influences investor perceptions of firm performance. She finds that the quantitative description of prior period gain or loss in current year earnings announcements helps investors evaluate firm performance.

Method. When an amount in a press release is accompanied by either a percentage or a prior year amount, the performance comparator is coded as positive or negative depending on whether it shows an improvement or deterioration compared to the comparator.

Illustration. Bias using performance comparisons may occur when companies use a benchmark conditional on the direction of the news (either good or bad news). A company may disclose negative quantitative items without including a performance comparison but they may use it when reporting positive amounts. For example, the same company includes results in the headline of the press release using a benchmark when referring to positive outcomes ("The group records net profit of 1,805 million euro, a gain of 16.4 %") and the next year the same company does not use a benchmark when referring to negative outcomes ("Group

net profit totals 962 million").[6] Following this method, the company is able to reinforce and discuss the positive outcomes while only mentioning the negative outcomes for the current period without discussing the negative change in relation to the year before.

3.4 Selectivity—Choice of Earnings Numbers

Definition and background. Selectivity in financial reporting has been primarily investigated in the context of research on graphs, where the numbers selected for representation enhance good news imagery and minimise bad news. It is rare in impression management research for selectivity to be studied in corporate narratives. However, in a sample of 433 press releases, Johnson and Schwartz (2005) find evidence of selectivity in that income-increasing *pro forma* adjustments to GAAP earnings dominate their sample. Nevertheless, some highly profitable firms make income-decreasing *pro forma* adjustments, so the evidence is not conclusive.

Method. Companies are expected to be selective in the financial amounts they disclose in press releases, choosing higher profit/earnings per share numbers from the range of numbers available for disclosure because this gives a better picture of corporate performance. Quantitative amounts included in PREA may be selected from the profit and loss account or from elsewhere (*proforma* numbers). Quantitative amounts in press releases are categorised as GAAP numbers (i.e. the product of Generally Accepted Accounting Principles and appearing in the audited profit and loss account) or *proforma* numbers. The GAAP numbers are ranked from the lowest to the highest, based on monetary value. The amount selected for inclusion in the press release is identified. The amount chosen for inclusion in the press release is assigned to one of three categories of selectivity, High, Medium or Low.

Illustration. For example, a company performing poorly (Profit after tax and minority interests in current year £198.9 million and £193.5 million in prior year) selects for inclusion in the PREA an amount that excludes exceptional items to show positive profit. The company chooses to include in its PREA operating profit the figure of £373.2 million. Following this strategy the company can show increases in earnings (prior year operating profit amounts to £313.1 million).

3.5 Attributional Bias

Definition. This strategy is defined in prior literature as "a phrase or a sentence in which a corporate event or performance outcome is linked to a reason or cause for

[6] In this case, the previous year's result is 1,313 million, therefore there is a decrease of 27 % in net income.

the event or outcome" (Aerts 2005; Aerts and Cheng 2011). There are three main categories within attributional bias: (1) Assertive causal bias, which consists on attributing positive outcomes to the company's own actions (entitlement), (2) defensive causal bias, where companies attribute negative outcomes to external events (excuses), and (3) enhancement, which is the framing of a positive outcome relative to negative external factors.

Method. Assertive causal bias is calculated as the number of positive outcomes explained internally minus the number of positive outcomes explained externally; defensive causal bias is calculated as the number of negative outcomes explained externally minus the number negative outcomes explained internally.

Illustration. The following example is a strategy of attributional bias known as defensiveness or defensive causal bias. "The very severe downturn in financial markets in the past eighteen months brought about by the Global Financial Crisis has adversely affected nearly all investments, and as a consequence of this downturn, the investment options of the company with exposure to the global share markets have recorded negative returns for the second financial year in a row". The company blames external factors (in this case the global financial crisis) for their decrease in returns.

4 Summary and Conclusions

Companies perceive their websites to be an important vehicle for disseminating information to shareholders and potential investors (Ashbaugh et al. 1999). The Internet has provided users with timely and cheap information which has changed the investment environment, allowing non-sophisticated investors easy access to trading systems. However, the ability of unsophisticated users to interpret and make informed investment decisions with this information is debatable. This is of particular concern in a setting where managers can choose to include self-serving disclosures in their corporate reports. This work highlights potentially misleading disclosure practices in one form of accounting narratives, online PREA. Evidence supporting the selectivity of positive rather than negative information to be included in PREA in prior literature is very strong. Prior literature shows that managers make some aspects more salient while downplaying others, to attract readers' attention usually to the positive outcomes. One way of making information salient is to place it in the headlines. This is particularly relevant for PREA which are listed on company websites by headlines. Headlines are, therefore, an interesting instrument for management communication strategies (Guillamon-Saorin et al. 2011; Guillamon-Saorin and Martinez-Lopez 2013).

Consistent with prior literature, the current study supports the argument that managers make use of the scope allowed in preparing press releases to meet their corporate reporting objectives by using a wide range of potentially misleading disclosure practices (Brennan et al. 2009; Garcia Osma and Guillamon-Saorin 2011; Staw et al. 1983). Visual emphasis is a rather subtle technique which may

not be easy to detect. Therefore, visual emphasis may have a powerful effect in helping managers to create the desired impression of the company in the minds of readers while it is difficult to assess or regulate.

The contribution of this study is essentially theoretical. First, it points out the distinction between verbal and non-verbal impression management techniques. Second, it emphasises the need for a flexible analytical framework that addresses the wide variety of rhetorical strategies within a disclosure document. By presenting a descriptive analysis showing the existence of these disclosure practices and how they can be detected, this study provides a thorough understanding of the impression management concept.

4.1 Implications of the Research

Our results are important for regulators, auditors and equity investors alike. Impression management may be a response to the regulatory framework. Narrative disclosures are generally unregulated. The findings of this research suggest that policy makers need to reconsider the need to regulate narrative disclosures in key documents such as press releases which are currently unregulated, especially if these documents are posted on company website that reach a wide audience. This audience may have a different level of sophistication in relation to accounting and financial information. Non-sophisticated users are a potentially weak target who may be easily influenced by self-serving reported information (Elliott 2006) and need to be protected. In this regard, regulators may need to consider the need for attestation services provided by accounting professionals to audit online disseminated financial disclosures. In relation to the regulation of narratives, Schleicher and Walker (2010) find that forward-looking disclosures are used to bias narratives in the outlook of the annual report. They question the rationale of leaving forward-looking annual report disclosures unregulated and unaudited. This suggestion is arguably even more important for disclosures in press releases, which are more widely disseminated in the media and read by more users than annual reports (Bartlett and Chandler 1997). The strong regulatory safeguards applied to financial statements may need to be extended to other disclosure vehicles such as press releases. This raises a number of questions: Is it possible to regulate impression management? Do regulators pay enough attention to the more subtle aspects of financial reporting such as impression management? Huang (2005, p. 115) points to the legal difficulties of regulating types of impression management. He distinguishes between vague statements, such as "we are bullish on this company's future prospects" and those that induce "false implied meanings that are thus deceptive, misleading, and can be disproved". He argues that only the latter type of statement should be legally actionable, since the first type "is unlikely to induce any false implied meanings that directly affect investors' beliefs concerning that company's securities". Similarly, auditors may need to review annual report disclosures included in press releases for consistency with the information in the financial statements.

Similarly, Clatworthy and Jones (2003) question whether the auditors' brief should extend beyond financial statements to include narrative disclosures in annual reports. This line of inquiry on the role of auditors/regulators and impression management could be developed. However, is it realistic to expect auditors and regulators to take action on such a subtle activity? Finally, equity investors need to be aware of the bias in corporate documents such as press releases to ensure that they are not misled by such partial disclosures.

4.2 Suggestions for Future Research

Online corporate communication practices are increasing in relevance and complexity. With the development and globalization of capital markets the corporate communication function has started to change, focusing on the organization as a whole and on the important task of how it presents itself to all interested parties, both internal and external. In this sense, companies communicate not only with shareholders but also with other key stakeholders, such as investors, customers and consumers, employees and members of the community in which the company operates. With the globalization of markets, companies need to be aware of the international potential of customers and investors. Future research could investigate the relevance of the audience in terms of corporate reports and their preparation.

Another issue is the intentionality behind these impression management practices. We do not test managers' intent in their language disclosures. It is possible that impression management reflects a basic human instinct to present oneself/one's company in the best possible light—a form of executive hyperbole rather than a deliberate distortion. More interestingly, managers may report lower (higher) levels of pessimistic (optimistic) language in their earnings press release as part of their earnings management strategy in an attempt to convince, and perhaps mislead, readers that earnings are not managed. It is also possible that managers rely on language to signal high quality earnings, especially if they believe the market may question the quality of their earnings when they exactly meet or just beat analysts' forecasts. These issues are worthy of attention in future work.

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