Ewelina Lacka · Hing Kai Chan
Nick Yip *Editors*

E-commerce Platform Acceptance

Suppliers, Retailers, and Consumers

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Preface

Originally designed for data exchange, the Internet is now an essential point of interest for all businesses. It is a flexible, interactive and an efficient platform for commerce and this allows generating and facilitating all business activities ranging from information search to transactions. Through increased commercial interactions, the Internet has developed and grown into an e-commerce platform which promises countless opportunities and is now considered to be the world's fastest expanding marketplace.

This rapid expansion is directly related to the widely held perception of e-commerce as the source of new business opportunities. Additionally, with increasing critical attention being paid to the digital economy, e-commerce helps with improving effectiveness and efficiency across all business activities. However, before businesses can fully benefit from e-commerce, they have to recognise the different threats deriving from e-commerce acceptance as it can have an impact, positive or negative, on all parties' stakeholders throughout the supply chain. The main commercial consideration should be whether businesses will achieve the desired competitive advantage while turning to the virtual marketplace or whether their acceptance of the e-commerce platform will achieve the desired competitive advantage or prove to be just a risky investment decision that can have major impacts that negatively impact on their current position in the market. This book offers answers to these questions by encompassing a collection of studies focusing on opportunities and threats deriving from e-commerce acceptance for the different stakeholders of all parties within the supply chain.

The book is divided into three main sections: Suppliers, Retailers and Consumers. In the first section, Suppliers, the application of e-commerce for Supply Chain Management in the food industry is discussed, where potential benefits of e-commerce, i.e. support for development of new markets, are mapped against risk deriving from application of e-business tools in this particular sector. Next, potential benefits and barriers of e-commerce acceptance for Supply Chain Management in a developing economy are evaluated and recommendations are made on how to overcome identified challenges in order to fully benefit from e-commerce technology. The section ends with a discussion of security concerns in cloud-enabled e-commerce in the Supply Chain Management.

The next section, Retailers, offers a review that examines the role of electronic reverse auctions in a business-to-business model and presents some propositions to

maximise its use as an effective e-purchasing tool. Further, this section presents a wide variety of pointers as to how e-commerce applications can be used to enhance the performance of businesses. The guidance given here is later compared and contrasted with challenges deriving from e-commerce activities and especially those related to brand management in a virtual environment.

The book concludes with the Consumer Section where culture-specific advantages of e-commerce are compared and contrasted with disadvantages deriving from e-commerce activities, i.e. lack of face-to-face contact and/or lack of possibility to physically touch and examine the product. The section ends by providing guidance for website development while keeping in mind multiple human factors.

We believe that a book structured in this way offers a balanced view on foreseeable and existing opportunities weighed against threats deriving from e-commerce acceptance within the various parties of the supply chain. We hope that through this 'holistic' lens on e-commerce, the platform can be effectively assessed as an attractive and realistic option, or as a compulsory development.

We thank all authors, reviewers and publishers for their efforts to make this project feasible.

Contents

Part I
Suppliers

Chapter 1
Electronic Supply Chain Management Tools in International Business: Evidence from Austrian Food Clusters

Ilias P. Vlachos, Dimitra Skoumpopoulou and Sandra Gutnik

Abstract The aim of this research is to examine the electronic supply chain management tools in international business. The study investigates Austrian food clusters and discusses how business strategy can use e-business to support the development of new markets. The research comprised three case studies demonstrating examples of Austrian small and medium sized companies (SMEs) in the food and beverage industry already deploying e-business solutions in order to foster sales. In this context, risks and benefits of e-business tools as well as the potential advantages of a food cluster membership have been extracted. The findings of this research show agreement with the literature review in terms of the limited use of advanced e-business tools to sell food produce, risks and obstacles perceived by the companies in the area of food safety, legal requirements, available know-how and costs of implementation. However, the findings also demonstrate potential benefits of e-business tools SMEs could leverage in order to foster the creation of virtual alliances and to increase export sales to new and/or niche foreign markets. We provide recommendations which can be of use to SMEs in the food and beverage industry, the food clusters or other dedicated co-operations in Austria, the government and industry associations to direct their efforts towards a more advanced e-business strategy in this industry.

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1.1 Introduction

The Austrian food and beverages (F&B) industry is largely characterized by small and medium sized enterprises and many of them have started to operate their business outside the national boundaries (the export rate is 60 %). The food and beverage industry on average creates annual gains of approximately EUR 7.7 billion and exports to countries such as Korea, Japan, China, US, Russia and New Zealand—to name but a few (Austriaexport 2010). For the entire European Union a share of 99 % SMEs to provide food and beverage produce, to employ around 60 % of total industry employees and achieving approximately half of the sector's turnover holds true, which indicates the importance of these businesses on a cross-border scale (Fritz 2007, pp. 13–15). In 2006, an EU report concluded that in general in the F&B industry e-business tools within SMEs are mainly used in production and logistics whereas sales and marketing shows development potential (E-business watch 2006). The larger the company the more important e-business becomes for doing business and especially improving internal supply chain management, customer service and product quality. Web based solutions can improve supply chain efficiency in large companies although focus areas are the internal rather than the external processes such as procurement and sales. Opportunities thus arise to leverage the benefits of e-business solutions for additional supply chain efficiency gains also in small and medium sized companies and in terms of online sales (currently used only by 5 % of companies). In terms of potential market entry stimulus, e-business solutions and their benefits to access information and improve procurement of input factors may support the development of and the entrance to new markets. In fact, e-supply chain management tools may act as a competition and market entry enabling factor (Bourlakis and Vlachos 2011). Outbound and inbound transportation is a very important aspect of reaching new markets as well as sourcing input factors for production. Companies therefore increasingly rely on co-operations with third party logistics (3PL) providers to tackle the increasing cost pressure, often through the use of web-based collaborative networks (Blanchard 2010, pp. 20–21).

E-supply chain management combines e-business and e-supply strategies using online tools as the face to both the customers as well as the suppliers. It is especially argued that logistics and procurement are underrepresented in terms of use of web based solutions and with the globalised economy becoming reality also for small and medium sized companies sourcing internationally and shipping abroad for potentially far away export markets need to be considered (Fritz and Canavari 2008; Fritz 2007; Van der Vorst et al. 2002; Wagner et al. 2003).

Tetteh and Burn (2001) argued that in order to truly leverage the benefits of e-technology, companies need to develop an e-business strategy. Small and medium sized enterprises (SMEs), however, due to their small size or young age do often lack such a strategy and Tetteh and Burn (2001) developed an assessment framework, named as SMALL (size, market, activities, linkages and locational

diversity), to assess the current use of web based solutions of three selected SMEs in Australia (Tetteh and Burn 2001).

This research contributes to existing knowledge about SME e-business activities in general and especially in Austria with its export oriented economy by providing insight into the e-supply chain management and internationalisation strategies of three small and medium sized companies in the food and beverage industry. The structure of the chapter is as follows: Next section presents the literature review, and then the methodology section follows. Then, findings from the case studies are discussed. The chapter concludes with a discussion of the results and recommendations for future research.

1.2 Literature Review

1.2.1 Food Supply Chain Management

Supply chain management deals with the coordination and organisation of the flow of products, services, information and resources in a network of entities. An efficient and effective supply chain management is about customer needs fulfilment and reduction of total landed costs through coordinated and integrated activities and information sharing (Chopra and Meindl 2007, pp. 5; Wisner et al. 2008, pp. 8–10). However, a well-managed supply chain may imply a competitive advantage and needs a strategy in order to be sustained. Consequently, the adoption of e-supply chain management needs a supply chain strategy. Essential, though, is the understanding that each and every action needs to be guided towards the customer. Modern supply chains, thus, need to be sensible and responsive to demand changes and in doing so companies need to reduce lead time, optimise inventory management, decrease tied-up capital, ensure timely delivery, food safety and information transparency and streamline research and development for the creation of customised products. Nowadays these improvements can be achieved in the food and beverage (F&B) industry with the help of information and communication technology (ICT) (Bourlakis and Vlachos 2011, pp. 167; Jespersen and Skjott-Larsen 2005, pp. 53; Hafeez et al. 2010, pp. 540).

In order to cut costs and improve responsiveness active supply chain management has become crucial in the agri-food chain where technological innovations have led to tremendous efficiency improvements and price cuts over the last decades. To keep up with the pace of growth within the global as well as local market and to communicate food safety and quality to a growing number of knowledgeable customers companies need to work together in order to guarantee a safe supply of food products. Collaboration is thus increasing especially with retailers as it is them who act as a direct communication channel to the final customer (Fig. 1.1).

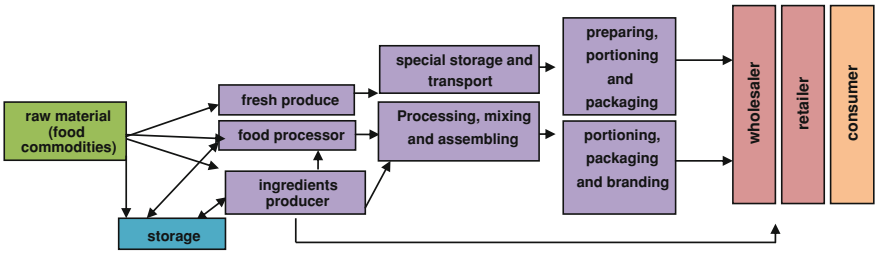

Fig. 1.1 Agri-food value chain research methodology (Adopted from: Aruoma cited in Bagchi 2008:144)

Small and medium sized companies need to increase their efforts towards supply chain coordination. Coordination together with information exchange and risk sharing is amongst the most important issues in order to improve supply chain performance. Therefore, companies form horizontal and/or vertical partnerships to leverage benefits such as economies of scale and scope and sharing of costs and risks (Bourlakis and Bourlakis 2004, pp. 227–228).

In today's global economic environment, ICT fosters the overcoming of geographic distances and cross-border food supply which have increased recently. This may imply an opportunity to develop new markets and international cooperation especially for SMEs (Van der Vorst 2006, pp. 15–18). In the food and beverage industry, however, the implementation of e-supply chain management tools mostly comprises the use of e-mail, websites, online banking which is followed by the implementation of electronic data interchange (EDI), enterprise resource planning (ERP), inventory, warehouse and order management system and finally supply chain execution systems, advanced planning systems (APS) and e-marketplaces. Their implementation and optimization with the aid of e-supply chain management tools in the food and beverage industry will be discussed in the following sections after a brief introduction of e-business and e-supply chain management.

1.2.2 Electronic Supplier Relationship Management in the F&B Industry

In the last years many governments and especially the European Union through its e-business initiatives have fostered the establishment of e-procurement and e-sourcing. Within the food and beverage industry, though, online sourcing of raw material is still underrepresented although the need for global sourcing of raw material increases due to lack of domestic supplies (Fritz and Canavari 2008, p. 355; Gallacci 2005). E-supplier relationship management (E-SRM) is often used synonymous for electronic procurement. E-SRM, however, is more than just

sourcing, it also includes supplier analysis, spend analytics, transaction execution, establishment of strategic supplier relationships, joint planning, payment and contract settlement which can be carried out using specialised web-based programmes (Wisner et al. 2008, pp. 95–99).

One approach to source input factors online is the use of an online auction tool where buyers prepare tender documents online (e-tendering or electronic request for quotation e-RFQ) and sellers bid. These provide the firm with the opportunity to get into contact with geographically dispersed potential suppliers and conduct a business transaction via a secure online intermediary. At first e-auctions have only been used to trade commodities but in recent years the large scale contracting of services accounts for an increased share of total transactions (Schneider 2011, pp. 304–315).

Besides online auctions, e-marketplaces may be used to source raw material and constitute an extension to e-auctions as they act as an intermediary and foster interaction between buyers and sellers more dynamically. These platforms enable companies to share demand and supply information, execute transaction, introduce and monitor food safety and quality standards, establish collaborative processes, enlarge the supplier pool and are to a large part privately (one to many) owned and industry specific (Holt et al. 2007, pp. 44–45; Van der Vorst et al. 2002, pp. 123). Examples include private e-markets (PeMs) such as those of WalMart or Sainsbury's and on the other hand public or independent e-markets (IeM) like eBay or Free-Markets. A consortium e-market (CeM) such as e2open, Covisint or GlobalNetXchange (GNX) may be seen as a strong variant of private electronic trade exchange as members ensure liquidity, act like a cartel, foster industry wide standard and process development, strive for efficiency improvement and increase intra-group collaboration and cooperation. An initiative planned by the European Union to develop ICT for the agri-food industry called e-MENSA aims to bring together know-how from industry experts and companies to provide solutions for the creation of a public e-platform (Tecnoalimenti 2011).

Electronic negotiations and contracting are often used for standardised processes or regular purchases. Nevertheless, applicability of law especially in cross-border transactions, conditions such as power, culture, effects, legitimacy, patent issues, trademarks and handling of intellectual property, notice periods, enforcement and dispute settlement need to be considered respectively (Schneider 2011, pp. 330–350). Most important for the electronic clearing of a contract, though, are trust and security as perceived risk is higher in electronic transactions. When agreeing on a contract electronically the related parties do not meet physically, thus, it is a distance contract where signatures need to be made using a secure online signing process (e-sign). To ensure a trustworthy business relationship, electronic contracts, negotiations and the set up process may be documented electronically in order to receive a track record and hence foster future transactions and the incremental establishment of standardised electronic contracting transactions (Bacarin et al. 2008, pp. 71–75; Canavari et al. 2009, pp. 325–326; Urbano et al. 2010, pp. 265–268).

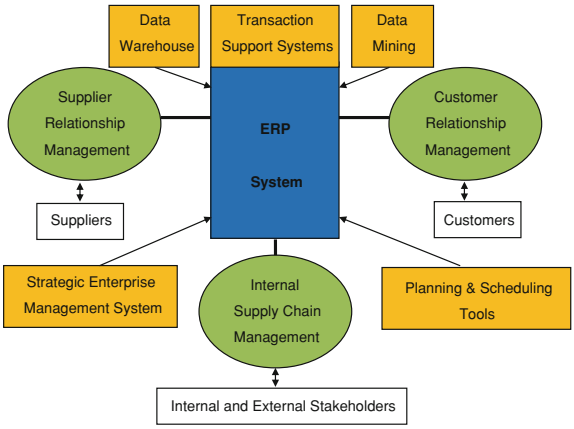

Fig. 1.2 The role of ERP in the e-supply chain strategy (Akyuz and Rehan 2009)

Large retailers possessing the respective buyer power might force small and medium sized suppliers to implement e-business tools such as vendor managed inventory, electronic data interchange (EDI) or in order to agree upon a tender (Gallacci 2005). Depending on the strategic importance of the business relation, however, the respective interface for collaboration might be agreed upon also taking into account the resources of the smaller supply chain partner.

1.2.3 Electronic Integrated Supply Chain Management for F&B Manufacturers

The relatively cheap access to the Internet nowadays enables SMEs to leverage the benefits of cost efficient information storage and exchange and improved automated processes across the supply chain. Internal processes such as planning, production and operation (real time management of product life cycles, production flow, planning and scheduling as well as demand and supply matching), maintenance and logistics may be supported through the use of internet and Enterprise Resource Planning (ERP) systems (Vlachos 2011; Fritz 2007, pp. 14). ERP systems may be seen as the basis for the introduction of other supply chain management tools such as SRM and CRM. Figure 1.2 describes how ERP acts in connection with other e-supply chain management tools.

The ability to manage information not only with external supply chain partners but also between the various departments is crucial for efficient operations and is seen as a prerequisite for external integration by some researchers (Lan and Unhelkar 2006, pp. 3–5). ERP may support the reduction of lead time and improve inventory management for the purpose of more efficient resource deployment, planning efficiency and thus higher asset utilisation. The right information system could help SMEs to design marketing strategies for new customers in export

markets, form long term customer relationships and product development alliances (Akyuz and Rehan 2009, pp. 3267–3270; Bayraktar et al. 2010, pp. 430–432).

Food supply chains may be described either as fresh food supply chains where packaging, trading, handling and storing are the most important tasks within the value chain whereas within a processed food supply chain the focus is on the sourcing of raw agricultural material and the production of value added products for the final customer. Food and beverage industry products, thus, may have several characteristics which need to be taken into account when designing an e-supply chain management strategy. These include (Fritz 2007, p. 13; Fritz and Canavari 2008, p. 355; Van der Vorst et al. 2002, pp. 124–129):

- Nature of the product /perishability
- Seasonality
- Speed and time to market (especially for fresh produce)
- Food safety
- Quality variations
- Raw material supply volatility
- Consumption trends
- Transparency of delivery
- Legal requirements

As a result, food supply chains have established close alliances along the value chain to guarantee timely supply of the right quantity and quality of raw material and semi-finished goods for further processing. Moreover, transparency and safety has been fostered through the introduction of track and trace processes using latest technology such as radio frequency identification (RFID) or sensing technology. According to Erdem et al. (2008) as soon as the application of these sensors on the food packaging material is cost efficient these may be used to detect biohazard in the future. The authors in this context mention two currently available systems—ToxinGuard and Food Sentinel System. Due to the fact that the European Union Food law has pledged producers of the F&B industry to enable food traceability since beginning of 2005 the use of wireless sensors throughout the food value chain has gained increased attention in research (Erdem et al. 2008). McMeeking et al. (2006) state the increased need for integrated system solutions where traceability systems are linked with finance databases, production scheduling and management software. Food traceability, however, needs the use of standardised classification of raw material and semi-finished and finished goods which can be achieved through application of information carrying technologies such as car codes, RFID tags or manual labelling. A project within the European Union about food traceability—the TRACE project—has been set up in order to achieve both increased consumer confidence in food safety as well as development of adequate applications and standards for producers to ensure the seamless functioning along the whole value chain (FERA 2011).

1.2.4 The Austrian Food and Beverage Industry

According to the European Union SMEs are companies which have a maximum number of employees of 250, a turnover of less than EUR 50 m or a balance sheet total of less than EUR 43 m. They account for 99 % of the total companies within the EU and are a major driver of entrepreneurship and innovation (European Commission 2009).

In Austria, nearly 100 % of all business activities are carried out by small or medium sized companies and these are located on a relatively small domestic market. Austrian SMEs are largely dependent on export business and the opening of new markets may prove to be difficult due to the general lack of resources within SMEs. Internationalisation strategies reduce risks, decrease transaction costs and increase economies of scale and scope (Fink and Teodorowicz 2008, pp. 42–43). Henningsson et al. (2010) analyzed the trade roots of dairy within and outside Europe and the respective critical areas using Arla, the second largest manufacturer of its kind in Europe, as a case study and found as most important factors the correct preparation and processing of health certifications, export declarations, country of origin certification, VAT settlement, invoicing and freight forwarding. Henningsson et al. (2010) concluded that the competitiveness of the European food and beverage industry on the global market is low. Most important in this context is the lack of innovation and this is where small and medium sized companies might find a niche market (Henningsson et al. 2010, pp. 73–76).

In 2011 the Austrian food and beverage industry which is characterised by a large share of SMEs accounted for a total production value of EUR 7.4 billion, with exports of EUR 5.6 billion In the first 2 months of 2012 the more than 700 Austrian companies of the food and beverage industry exported goods in the value of 1.3 billion EUR or 57.5 % of their production volume to more than 100 countries worldwide (Austrian Chamber of Commerce 2011). Out of these companies, 95 % are small and medium sized companies and their main export markets are within the European Union—more than 80 % of the exports are made to the EU-27. These include the neighbouring countries of Germany, Italy, Hungary, Slovenia, Czech Republic, the Netherlands and France, Switzerland. Increasingly, though, export goes to European countries outside of the EU such as Switzerland, Turkey and Russia or overseas countries such as the US, VAE, China, Brazil and Argentina.

Business clusters and related umbrella organisations and associations have been founded to foster the development of the industry. Leonidou (2004) and Wilson (2007) mentioned the importance of government programmes, education initiatives, financial support, consulting on legal issues and policies to foster SME internationalisation. Golovko and Valentini (2011) highlighted the importance of a combination of both innovation and export for SME success in new markets (Golovko and Valentini 2011, pp. 375–377; Leonidou 2004, pp. 295–297; Wilson 2007, pp. 53–57). Austrian government offers several subsidies and launched initiatives to support the development of both SMEs and the food and beverage

industry as a producer of quality and niche market food products—also for export. These initiatives include:

- Advantage Austria: an initiative to support Austrian companies in export activities through expertise, organised events and market intelligence launched by the Austrian Chamber of Commerce (http://www.advantageaustria.org/gb/).
- Go International: support of export activities in the same format than stated above but especially of SMEs, mainly into the neighbouring countries (http://www.go-international.at/go-international/foerderprogramme/Export__Foerderung/Export__F_rderung/index.php).
- Oesterreichische Kontrollbank AG (OeKB): A specialised branch of Austrian commercial banks for export activities provides financing support for exporting SMEs through credit insurance (http://www.oekb.at/en/Pages/default.aspx).
- Lebensmittelcluster Oberösterreich: the food cluster provides funds for joint innovative projects where at least one participating company needs to be an SME.
- Lebensmittelcluster Niederösterreich: Project to support the implementation of quality assurance systems (HACCP and IFS 22000) in SMEs.

1.3 Research Methodology

Case-study methodology was used for this study with the help of a questionnaire serving as a guiding framework for the personal interviews. Case studies are appropriate when exploring "what" and "why" questions, and when the researcher has no control over the outcome (Yin 2009). The general design for case studies includes the following five components: the unit of analysis, the research questions, the research propositions, the logical process for linking the data to the propositions, and the criteria for interpreting the findings (Yin 2009). In this study, the unit of analysis is food manufacturers.

A multiple case study approach is followed using structured questionnaires for data collection. The findings of the literature review regarding e-supply chain management, policies and subsidization and foreign trade promotion initiatives to support SMEs as well as legal and safety regulations for food and beverage export and food traceability are the basis used to compile a set of questions. In the regions of Upper Austria, Styria and Lower Austria a so called food clusters (Upper Austrian Food Cluster, TECHforTASTE and Food Cluster Lower Austria) have been established including companies producing food and beverage products, processing technology as well as their value chain partners such as first to third party suppliers, R&D partners and authorities (Neuhold 2010). We selected three best practice SME cases out of the clusters' members from different subsections and examined best e-scm practices.

We conducted in depth interviews with one company representative for each of the selected three specific companies belonging to a network of food and beverage

industry members using a set of predefined questions (Garner et al. 2009, pp. 172–173; Matopoulos et al. 2007, pp. 109–114; White 2000, pp. 28–42). The questionnaire used to act as a research instrument has been divided in several sections—e-supply chain management tools; food cluster network activities; internationalization and growth strategies; legal, safety and traceability constraints and policies, subsidization and foreign trade promotion initiatives.

The data analysis involves within-case analysis and cross-case analysis. Within-case analysis we analyzed the critical success factors, the implementation of e-supply chain management tools, the internationalization strategies and collaborations amongst value chain members (Vlachos 2004, pp. 161–164). Cross-case analysis draws cross-case conclusions and is connected to the concept of SME foreign trade promotion and subsidization by supporting trade activities such as those via online intermediaries by the Asia Pacific Economic Cooperation (APEC) and its APEC Global B2B Interoperability Project (Breukers 2006, pp. 74–85; Silverman 2005, pp. 109–111; Park and Yang 2006, pp. 245–250).

1.4 Findings

1.4.1 Within Case Analysis

1.4.1.1 Company A

Company A is a medium sized producer of pickles founded in 1940, based in the region of Upper Austria selling to multinational and local retail chains. With an annual turnover of 20 m EUR it is the biggest producer of this kind, with a market share of around 35 % the clear market leader and since 1995 a member of the Upper Austrian food cluster. It employs 200 staff in Austria and operates in 7 neighbouring with Austria being its main market with one large production site. Moreover, there are two trading companies in Poland and Germany—the company's fastest growing markets—and a small production site in Czech Republic. The main products include gherkins, cabbage, beetroot, paprika, pepperoni, carrots, green salad and apples which are sold under the company's name acting as the brand and amount to a quantity on 100,000 tons annually.

ICT Strategy and the Use of Electronic Supply Chain Management Tools

The company operates a supplier and customer relationship management tool via its corporate homepage where suppliers may log in and place offers for bids or communicate with the sourcing department. B2B customers—mainly large retailers such as Spar, Billa, Tesco or Carrefour—have the opportunity to conduct business using the B2B section of the homepage. "*It's important to meet the needs*

of customers and enable collaboration with strategically important suppliers" describes the managing director of the company. It becomes obvious that out of a number of possible e-supply chain management tools the right mix has to be found based on the company's environment which is affected by industry, the products offered and the members of the upstream and downstream supply chain. Company A relied on a customized software that enables to operate interfaces to the systems used by its major customers. "*This flexibility and customizability was the main reason to choose the software as there is a certain pressure of large retail chains to adapt to their systems or create interfaces. In the long run this has always been a benefit as we could leverage the know-how of the customer's own ICT departments. This willingness to improve technology consequently helped to improve collaboration also with our suppliers*". Striving for electronic supply chain integration, thus, became the driver for internal process improvement where "*especially sourcing and logistics could be re-engineered through adaption to the new platform*".

Corporate Sourcing, Marketing and Sales

Corporate procurement is responsible for sourcing all input factors as well as services such as transportation, external quality control and legal consulting. Sales support on the other hand is put together by back office staff and key account managers who are in direct contact with the respective category managers at the customer. "*The right ICT strategy is one thing, to have the right people to work with new technologies another*". Acceptance is crucial amongst staff as the number of qualified employees is limited in a remote area of the country so employees were involved from design to implementation of the software.

The general manager of the company states that "*although international retail customers deploy e-marketplaces and e-auctions where bidding and business development is taking place, experience has shown that due it is often not possible to give as detailed product information as requested*". The same holds true for the acquisition of new suppliers, where in the past platforms for raw material sourcing have been used but as quality could not be guaranteed through product descriptions this has been stopped.

1.4.1.2 Company B

Located in a premium wine area of Lower Austria company B is a small family owned producer of quality wine founded in 1992, equipped with modern cellar technology to gain the best grapes from its 3.5 ha grounds. A preferred partnership with Spar retail chain was started in 1998 through which the wine is sold under the name of the winemaker, the appellation and the grape variety. The wine is produced for the domestic market and abroad leading to an export share of more than 50 % in 2010.

The Establishment of an Online Sales Channel

From the beginning the company focused on export, took part in national and international trade fairs (Pro Wein, Forum Vini, London International Wine Fair) and thus could attracted importers as distribution partners to sell the products to restaurants, bars and foreign consumers. "*In selling abroad the biggest challenge is frequent contact with the distribution partners in Germany, UK, USA, Italy, Benelux, Scandinavia and France.*" To meet the requirements of the importers standards for bottling, transportation, licenses and legal requirements are defined. "*A focus is on labelling as in some countries more information has to be provided*". Hence, know-how of local markets and regulations is important in the international wine market and company B accounts for it through cooperation with its agent customers.

The winemaker decided to build an online sales channel where consumers could get information about and select the wines on offer directly from the vineyard's homepage. Attraction of customers was based on quality as the credo of company B is a "*focus on quality as this is what we are known for*". Thus, the country of origin effect is important but more in terms of Austria as a premium producer of wine. Besides the direct approach of consumers via homepage or agents, company B benefited from the preferred partnership with Spar out of their focus on wine sales in the shops. An area where consumers could get information about wine and food via a bar code scanning device was established as well as an online wine shop. Spar acted as an electronic wine selling intermediary being the operator of an online market place and offered company B a contract to sell via this new electronic sales channel. The purpose of Spar was to compete with other retail chains and the wine retail chain Wein & Co, hence the need to establish contracts with well known vineyards. The owner of company B emphasises that "*in terms of supply chain management it is a fruitful strategic alliance with benefits for both parties*". The vineyard could capture retail customers and direct consumers through its twofold online sales strategy. As the production is integrated, the quality assurance is extended to the supplies of bottle and cork deliveries which are strictly controlled by requesting certificates and through external audits. The outcome is the high quality of the wine which according to the owner is the most important message sent to the customer to create trust. "*The number of awards and recessions by wine experts rewards the work we do and for a certain consumer segment these are decisive when it comes to the wine purchase decision*".

At first, company B actively operated an online sales channel to sell its wines directly to the customer which increased annual turnover by 50 k EUR. Sourcing activities with the small number of suppliers are operated through the use of email and telephone communication as the suppliers as such do not engage in more sophisticated e-supply chain management tools. Sales growth based on the cooperation with the national retail chain and its online sales channel whose use tripled the benefits of electronic selling to more than 150 k EUR. Company B is an example for how technologically attentive development can improve sales,

establish fruitful partnerships and make the product known. "… *as Austrian wine is becoming more known around the world we might attract customers from other continents*".

For product development the winemaker relies on trends in wine drinking behaviour which are monitored through data supplied directly from Spar point of sale. "*Grape material may not be changed easily just within a few month and the decision to do so is serious*". Thus, company B dedicated small parts of the land for new varieties. "*Besides the choice of new varieties and blends, which are becoming more popular we invest in new technologies to process the grapes such as steel tanks or wood chips. The data on drinking preference offered to us by Spar is an important source to anticipate new demand*". Company B increased sales and profits in diversifying the sales channels, investing in technology and increasing the cooperation with other winemakers and associations. Cooperation is a means to develop and establish new markets and thus the strategy may first be carried on to the countries where company B is currently selling to. Even in a business where basic production techniques remain stable over the last decades modern technology such as means of electronic supply chain management may benefit the sales side of the operation as well as the sourcing and product development.

1.4.1.3 Company C

Company C is a small trading company selling fruit to several neighbouring countries of Austria and beyond with the purpose to act as an export cooperative for local producers. The export rate is 100 % with all merchandise being sold abroad to basic food substance manufacturers, retail chains and food processors. Company C employs 8 people, earns an annual turnover of 40 m EUR and is the biggest fruit trading company in Austria. It was founded as a joint venture of apple marketers in 1993 in Styria, a region known for its production of apples. The core competence of the company lies in the marketing and sales of fruit by matching supply and demand in foreign markets and acting as an intermediary. "*The nearly 1,000 fruit producers are delivering their apples to our ten packing houses and after selection of the best quality we distribute them to our partners in the value chain all around Europe*".

Meeting Customer Demand on E-Business Trading Solutions

The cooperation is not only focused on supply side but also on demand side. "*The interconnection between us and our converting customers is quite strong as we are in steady contact in order to meet near just in time delivery requests*". Out of a customer need company C established a direct link to the customers trading platform and is now able to expand this virtual supply chain to other customers. This step towards a way of conducting business electronically is supported by the strong engagement of the general manager who is off the opinion that "*electronic*

trade is the future and hence one off effects for hardware investment will improve sales in the long run". Currently, this interface accounts for 2 % of the total business, "*but we are convinced that the share of total sales will increase as more companies seek efficiency improvement in e-business applications*".

The Export Strategy

Contacts to foreign customers and value chain partners have been made through participating in trade fares, road shows of the Government and active promotion of the produce by sending samples. "*The right export strategy needs good networking so we consider the membership in one of the Austrian food clusters. This may be helpful in targeting new customers, enables us to bundle core competences and develop a joint e-business strategy.*" Although the company is based in Styria it is considering the membership in the Upper or Lower Austrian food cluster as "*not the actual location is decisive but rather where we fit into contribute to and gain the most out of joint projects*".

Quality: A Major Issue in Fresh Produce Trading

"*Local producers are putting a great focus on quality.*" In the growing areas in the south of Austria the strict adherence to the quality standards jointly defined with the customers is controlled through assessments, site visits and mystery tastings. "*We never buy from producers with pure plantation because our customers increasingly prefer biologically manufactured food produce*". To prove this company C is using the services of the state owned Austrian Agency for health and food safety (AGES) to audit and check adherence to food regulations, food safety and consumer protection law. "*Our suppliers are carefully selected to maintain the high quality we are known for. It is ensured by standards defined with local authorities, independent audit bodies and our customers.*"

Selling abroad also means the need to comply with foreign food legislation standards so to meet these requirements consultant are used. "*On top of this there is a platform on our intranet where customers may get information on requirements and suppliers can specify them*". Hence, company C also provides a virtual platform for information sharing which "*must be extended by taking the online trading connection with the Finnish customer as a role model for all business relations. Currently, though, we are too small to stem the investment on our own*".

As a frame for the trading platform an ERP system with the possibility to create interfaces would be of use but the costs for these applications are still too high for most of the small companies.

1.4.2 Case Study Summary: Cross-Case Analysis

All three case study companies demonstrate one particular example of how SMEs may deploy e-supply chain management tools. What they have in common is the fact that they operate e-business tools on a very selective range. Company A operates its own platform to handle strategic alliances with customers and suppliers on a virtual basis as some of them are foreign. Company B started a joint project with a large retail customer to operate a virtual sales channel for wine and company C makes its first experience with an online auction in fulfilling the needs or requirements of a foreign customer.

A food cluster membership in case of company A can be beneficial for cooperation, innovation, support and subsidies, sharing of know-how and benchmarking. Company B is not a member of a food cluster but of a winemaker's association in order to promote sales in a specific food market segment. Also in this case, virtual tools might be of interest to foster wine sales—especially in the wake of a growing number of consumers in countries where the use of the internet for food shopping is more advanced than in Europe (China, India, Russia or Japan). Company C, however, is no member of a cluster yet but strongly considers a membership because of the potential co-operations and joint projects with other SMEs that might be carried out.

Finally, the interviewed companies indicate that there is certain risk to operate e-business tools. All three of them mentioned quality and quality control in connection with selling food online as well as costs and legal requirements as potential drawbacks. However, there are ways to diminish them by finding solutions that combine both e-supply chain management tools and traditional applications. One such example is a combination of virtual exchange of information or food safety requirements together with the physical control of quality through (external) product testing.

1.5 Discussion and Conclusions

The case studies presented show three different e-business models with a company operating its own interface to customers and suppliers on the corporate website, a winemaker selling via an external e-marketplace to final consumers and a company trading fruit commodities to a customer via online auction. These are exceptional cases amongst the Austrian food and beverage industry as the highest development of an online sales channel still is the online shop and most of the SMEs rely only on conventional e-business tools.

The following managerial implications can be offered:

- *Implementation support* Due to the low level of support the SMEs received to implement e-business tools it is recommended to introduce a project within the Austrian Chamber of Commerce for the section food and beverage that deals

Table 1.1 Opportunities and threats of implementing e-business tools in the Austrian food and beverage industry

Opportunities
Managing strategic alliances with customers and suppliers
Deployment of virtual sales channels
Meeting customer requirements concerning web-based cooperation
To seize sales opportunities in foreign markets by opening up a lead over competing SMEs
Ability to cut costs in the supply chain
Cross industry benchmarking, know-how sharing and cooperation
Threats
Inability to guarantee quality and secure quality control in connection with selling food online
High costs of implementation and lack of funds for SMEs
Legal requirements in the food and beverage industry not being compatible with online selling
Lack of implementation know-how
Willingness to accept new technologies by the companies' stakeholders

with the acquisition of know-how and subsequent establishment of a team of experts which is able to design, create and roll out customised e-business solutions to SMEs in the F&B industry. In doing so, companies interested in the implementation of such tools might communicate with one central body coordinating the support.

- *The role of food clusters and the use of e-marketplaces and e-auctions* As company A indicated, several cooperation possibilities and benefits from know-how transfer it might be advisable to extend this know-how sharing to other industries for cross industry benchmarking as well as in terms of technology by using a virtual platform. Moreover, many multinational retailers already use e-business tools for sourcing. Online platforms including e-marketplaces and e-auctions can be integrated within existing food clusters.
- *Future role of Austrian F&B SMEs on the global market* In today's globalised markets e-business solutions are advancing and thus selling food via a virtual sales channel might mean the one step ahead of other small and medium sized food and beverage producers in Europe especially when it comes to selling to newly developing markets such as Middle East, Russia, China or South America. Distribution of food produce is always an issue but SMEs may form alliances in order to cut costs. With the deployment of temperature control or biohazard detection sensors and state of the art freight forwarders delivering to countries far away might become more realistic.

The opportunities and threats of implementing e-business tools in the Austrian food and beverage industry identified in this research are listed in the Table 1.1.

1.5.1 Limitations and Recommendations for Further Research

Case study research has limitations in terms of generalise findings to a wide population. A recommendation is to do a follow-up survey in European food SMEs to examine the same research questions. In this context, it would be of interest to measure the impact of e-business tools on exports. Furthermore, the view of the consumer buying via web-based tools has not been discussed in this research so the current situation of online food sales might be assessed.

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Chapter 2
Challenges to the Adoption of E-commerce Technology for Supply Chain Management in a Developing Economy: A Focus on Nigerian SMEs

Gareth R. T. White, Ademola Afolayan and Eoin Plant

Abstract The evolution of Information Technology has enhanced consumers' and organisations' ability to gather information along with purchasing goods and services. Information Technology offers businesses increased competition, lower prices of goods and services, the choice of comparing products from different vendors and easy access to various vendors anywhere, anytime. Therefore, Information Technology facilitates the global nature of commerce. In developing countries, e-commerce dominates their economic activities. E-commerce is one of the leading non-oil sectors in Nigeria, 18.9 % GDP. In contrast with developed nations, e-commerce has not been as successfully adopted in developing countries. This chapter addresses the challenges and benefits of e-commerce technology in relation to SMEs in Nigeria. It presents quantitative evidence of SMEs perceptions of e-commerce technology, benefits, and barriers. A number of hypotheses are presented and assessed. Recommendations to mitigate barriers are suggested.

2.1 Introduction

Information Technology (IT) solutions are broadly seen to encompass a wide range of "*software, hardware, telecommunication and information management techniques and applications that are used to create, produce, analyse, process, package, distribute, receive, retrieve, store and interpret information*" (Barba-Sanchez et al. 2007, p. 105).

In almost all developing countries of the world, e-commerce dominates their economic activities (Cloete et al. 2002). The importance of e-commerce in Nigeria cannot be over emphasised (Toyin and Damilola 2012) as it is one of the most vibrant of non-oil sectors in the country. The OECD (2008) identified commerce as one of the leading non-oil sectors in Nigeria, 18.9 % GDP.

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Electronic Commerce (EC) evolved as a result of commerce taking advantage of the diverse benefits IT has to offer (Kapurubandara and Lawson 2006). EC can therefore be described as the utilisation of various IT tools that support the advancement and development of business activities both internally and externally (Ghobakhloo et al. 2011; Chaffey and White 2010).

In this chapter, the authors refer to the combination of EC and IT tools as E-commerce Technology (EcT). We define EcT as any IT tool that aids the sharing of business information among trading partners, coordination and implementation of business transactions.

EC can be of great importance to an organisation in particular SMEs considering the fact that EC aids SMEs in competing with larger organisation and operate on an international scale (Cloete et al. 2002). It is widely accepted that EC enhances the advancement and development of businesses in developing countries. This is motivated by the perceived benefits of IT reducing costs of business processes (Ghobakhloo et al. 2011). Businesses in developing countries are faced with different challenges than businesses in developed countries (Molla and Licker 2005; Ghobakhloo et al. 2011). This suggests that EcT adoption and acceptance in developing countries is faced with a different challenge (Kapurubandara and Lawson 2006; Tan et al. 2010).

In contrast with developed nations, e-commerce has not been as successfully adopted in developing countries (Al-hudhaif and Alkubeyyer 2011). This is supported by Uzoka et al. (2007). Their study suggests the development of EC in developing countries is relatively low. Developing countries are still slow to keep up with emerging IT solutions to aid E-commerce (Kapurubandara and Lawson 2006).

The magnitude of commercial activities taking place in Nigeria and rapid development that has taken place in the field of information technology (Adekunle and Tella 2008) makes it imperative to probe into the possible challenges of EcT adoption by Nigeria SMEs.

The role of small and medium enterprises (SMEs) in developing countries is an important one, contributing to economic growth and thereby job creation and poverty alleviation (Golding et al. 2008; Adekunle and Tella 2008). SMEs are of particular significance to the economic development of Nigeria since they account for around 97 % of privately owned businesses (Ihua 2009). They have been recognized as the backbone of the economy employing approximately 50 % of the work force and providing more than 50 % of Nigeria's industrial output (Adekunle and Tella 2008). They play a significant role in enhancing the quality of human resources, generating employment, building a culture of entrepreneurship, supporting the large scale industries and encouraging the creation of new business opportunities (Harindranath et al. 2008).

SMEs serve many different roles within supply chains, as suppliers, distributors, producers and customers (Hong and Jeony 2006; Koh et al. 2007). The influence of globalisation on SMEs has compelled many of them to adopt EcT solutions in order to survive among increasingly competitive supply networks (Hsin and Anastasia 2008; Ongori and Migiro 2010; Stavrulaki and Davis 2010). There has

been a vast increase in the application and adoption of EcT in organisations for the storing, processing, distributing and information exchange within the firm and along their supply chains (Apulu and Latham 2011). Firms utilise EcT for many purposes, including enhancing efficiency and cost reduction, and for providing better services to their customers (Ashrafi and Murtaza 2008; Apulu and Latham 2011; Harrison and Van Hoek 2011).

2.2 The Role of EcT in SME Supply Chains

Supply Chain Management (SCM) comprises a set of approaches and practices to efficiently incorporate manufacturers, distributors, customers and suppliers. Thus, improving the long-term performance of individual firms and the whole supply chain, facilitating a cohesive and high-performing business model (Koh et al. 2007). The main objective of effective SCM is to set up a major source of competitive advantage for organisations to distinguish themselves from competitors by operating at a lower cost, thus at greater profit, which can be aided by the adoption of EcT (Christopher 2011).

The emergence of EcT has helped organisations achieve greater coordination and collaboration among supply chain partners and automate the supply chain process (Hsin and Anastasia 2008). With the advances and increasing availability of EcT, manufacturers, their suppliers and their distributors can all be linked together into a seamlessly integrated organisation (Stavrulaki and Davis 2010). The ability of SMEs to offer products and assemble goods at low prices within the quality standards stipulated by larger enterprises has helped increase the overall competition of the supply chain (Thakkar et al. 2009).

The implementation of EcT solutions to support SCM by SMEs can be cost saving for an organisation in many ways (Hsin and Anastasia 2008). It can increase flexibility, reduce the occurrence of errors in paper-based activities, achieve faster response times and lower the cost of labour (Alam and Noor 2009).

In spite of efforts being made by many organisations to use EcT solutions to support their supply chain strategy, challenges still exist that inhibit effective integration (Christopher 2011). Much of the literature recognises this is largely due to the fact that most of the suppliers are SMEs, that have limited skills and resources, and therefore makes integration with the rest of the supply chain problematic (Adekunle and Tella 2008).

2.3 Benefits of EcT Adoption

Technological revolution over the years has been a great development and this has changed the way business activities are being carried out both in developed and developing countries. The adoption of EcT offers many benefits across a range of

intra-firm and inter-firm business process and transactions among SMEs and their partners (Ongori and Migiro 2010). EcT is also expected to provide SMEs with competitive advantage along with integration among supply chain trading partners (Bhagwat and Sharma 2007). On the other hand, it is argued that other firms can easily replicate the adoption of a particular EcT solution and therefore it does not necessarily provide a sustainable competitive advantage for the adopting firm (Fasanghari et al. 2008).

The benefits of EcT adoption in SMEs can vary from cost reduction, easy and cheap ways of advertising and marketing, simplified communication with trading partners, to quick response to customers' needs, and the reduction of inefficiencies (Oluwatayo 2010; Singh 2011). The transfer of information electronically through networked computers and shared files can increase and improve the efficiency of an organisation (Ongori and Migiro 2010). EcT adoption in SMEs can greatly reduce operation cost by decreasing the cost of transaction, material cost, procurement cost and logistics cost (Tan et al. 2010).

EcT offers tools for improving external communication and quality of service for established customers, new customers and trading partners. Communication between trading partners helps to organize independent players to work together so as to achieve a common goal—profitability in changing market conditions (Singh 2011). Technologies help in improving the overall efficiency of their daily activities as well as reducing transaction costs and increasing the speed and reliability of transactions (Shiels et al. 2003; Chibelushi and Costello 2009). Radio Frequency Identification (RFID), bar code scanners are examples of EcT tools commonly utilised to improve communication speed and quality between partners (Collins et al. 2010).

Agility is an important factor for modern businesses particularly in their ability to make quick response to customers' changing needs (Li et al. 2008). The adoption of EcT is crucial for the effective performance of SMEs and for the delivery of quick service to meet customer needs (Singh 2011). EcT solutions facilitate storing, accessing and retrieving information electronically for organisational use and also quick decision making to provide a better service to customers (Akhavan and Jafari 2008). Enterprise Resource Planning (ERP) is one of the EcT tools that can help SMEs in forecasting future requirements (Apulu et al. 2011). As organisations grow and EcT becomes more advanced within an organisation, it enables them to determine and forecast buyers' spending habits (Harrison and Van Hoek 2011).

2.4 Barriers to EcT Adoption

E-readiness can be classified as one barrier that houses all other barriers to EcT adoption in developing countries and especially Nigeria. This represents the ability of a country, organisation or an establishment to create, adopt, diffuse and use various components of the networked economy (Uzoka et al. 2007). E-readiness in

developing countries is low when compared with the developed countries which may be responsible for the slow rate of EcT adoption in developing countries.

According to Fawcett et al. (2008) and Ihua (2009) SMEs are not a uniform or standardized set of businesses. They are in fact a highly heterogeneous collection of enterprises and vary substantially by size, sector, age, structure and location. These characteristics can directly influence the organisation's adoption of EcT (Apulu et al. 2011). Nath and Standing (2010) highlight the influence of company size upon the adoption of EcT and also claim that the adoption of EcT is directly related to the type of industry to which the organisation belongs.

Larger organisations are usually in possession of technical, human and financial resources that can be used to aid and enhance the adoption of EcT solutions. It is often a different case with SMEs, particularly in the face of limited financial and human resources (Ashrafi and Murtaza 2008; Mpofu and Watkins-Mathys 2011). However, it has been argued that SMEs are able to exploit EcT opportunities and adopt EcT more easily than larger organisations, simply because of the flexibility advantage they possess that makes decision making faster (Awa et al. 2011; Chuang et al. 2009).

The barriers to utilisation and adoption of EcT in SMEs can be broadly classified as internal and external (Awa et al. 2011; Kapurubandara and Lawson 2006). Internal barriers are those that exist within an organisation and can also be resolved within the organisation, that is, they are within the control of the organisation. They typically include organisational culture, lack of resources, managers/owners attitude towards EcT, and the level of training of employees. The external barriers are those that lie outside the immediate control of the organisation. These include a lack of infrastructural facilities and lack of funds from banks and other governmental bodies. It has been suggested that in order for these to be overcome SMEs need to work collaboratively (Kapurubandara and Lawson 2006).

Perhaps one of the most surprising barriers to EcT adoption is the lack of knowledge of EcT solutions, of how they work, how they should be implemented and how they can benefit the SME sector (Arendt 2008; Asharfi and Murtaza 2008). Studies have shown that most managers of these firms, and some of the employees, could not select an EcT solution that would be appropriate for a given type of organisational problem (Apulu and Latham 2009; Abor and Quartey 2010). Hence, there is a need for both the managers and the employees to undergo some form of training in order to be aware of the vast changing nature of EcT and to find the most suitable solution for the organisation (Golding et al. 2008). However, many managers' fear that they will lose their employees to other organisations after investing in training (Arendt 2008).

The authors note the reduction in EcT related content of business management degree courses in several institutions in the UK over the last few years. As EcT continues to increase in importance and value to modern businesses, this trend is both surprising and of some considerable concern. If this trend continues then one could expect EcT skills in SMEs and even larger companies to become severely depleted and EcT adoption to become even more challenging.

The adoption of EcT in SMEs may also require considerable effort from its users who need to learn how to use the system and optimize its functionality to deliver greater value (Korpelainen and Kira 2010). Furthermore, highly experienced employees of a firm might become entrenched with a particular software or system and then find it difficult to adopt new technology (Golding et al. 2008). However, a rapid rate of adoption can be seen when an organisation notices that an innovation or new technology is meeting the needs of the customer (Alam et al. 2007).

Nguyen (2009) argues there are three main reasons for the slow rate of adoption and unsuccessful implementation of EcT in SMEs. The first is that the management of the firms are not clear about how and why their firms should adopt EcT in the first place (Modimogale and Kroeze 2011; Chibelushi and Costello 2009). Managers of most SMEs do not understand the relationship between EcT and the firm. For example, young managers tend to be fascinated by unique and fresh initiatives and are more willing to take more risks than older managers. An older manager may therefore be reluctant to take risks to try out new technology (Chuang et al. 2009). Finally, the ever-changing EcT environment requires regular update and training to remain abreast of developments and opportunities (Modimogale and Kroeze 2011; MacGregor and Vrazalic 2006).

The attitude of management in an organisation plays a crucial role in the adoption of EcT as in most cases in SMEs the managers are the owners (Apulu and Latham 2009). Support from management of an organisation, most especially top management, is essential for successful EcT implementation and adoption for SMEs (Matlay and Addis 2003). If the management is not disposed to its adoption and utilisation, then SMEs will not be able to use EcT (Akpan-Obong 2007). The manager/owner's weakness therefore becomes a limitation of the business (Modimogale and Kroeze 2011).

Secondly, managers' perceptions of security and reliability significantly inhibit EcT adoption. These range from the fear of computer viruses, to the theft of money during electronic transactions, and data theft (Arendt 2008). The perceived potential of hackers gaining access to people's information and the level of fraud is one of the major barriers to EcT adoption in Nigeria. The majority of people do not believe that their information is safe online. For this reason, individuals and SMEs might be reluctant to perform transactions online that require the exchange of personal information (Olusegun et al. 2006). As a result utilisation of EcT in B2C (business to consumer) may be low. The lack of trust in supply chains can be argued not to be the fault of the organisation since customers might not be interested in using the EcT solutions offered by the company. This can be for reasons that include the potential for data or money theft (Olusegun et al. 2006). Such developments may also require a restructuring of the entire logistics and supply chain system to better serve and retain the customers (Arendt 2008) and this may be the reason for a company to shun the idea of implementing EcT solutions.

Thirdly, most SMEs do not have the capability to expand their IT resources due to limited access to capital (Golding et al. 2008). This is a common factor that affects the adoption of EcT in SMEs (Arendt 2008; Mpofu and Watkins-Mathys

2011). Most SMEs in Nigeria do not have access to bank loans or funding to support the development of EcT in their businesses due to lack of adequate collateral (Olorunshola 2003; Olusegun et al. 2006). Also paying back loans that have high interest rates and high bank charges can be too much of a burden for the majority of SMEs to bear (Abor and Quartey 2010).

Poor infrastructure can also be a problem that affects the adoption of EcT. The lack of internet access is recognised as a barrier to the adoption of EcT in Nigerian SMEs. It cannot be claimed that Nigeria completely lacks the necessary infrastructure, but it can be argued that the infrastructure is in a poor condition (Achimugu et al. 2009; Oshikoya and Hussain 2007). The unstable nature of electricity supply in Nigeria is one of the factors affecting the adoption of EcT: E-commerce technologies work hand-in-hand with stable sources of electricity supply (Apulu and Latham 2009). In fact it can be argued to be the most discouraging factor of EcT adoption by SMEs in the country as a whole (Akpan-Obong 2007).

Setting up the required infrastructure is expensive and requires significant funding (Achimugu et al. 2009; Arikpo et al. 2009). Some individuals in the country have actually taken it upon themselves to acquire and set up the necessary infrastructure needed to run the organisation and to better serve their customers (Ashrafi and Murtaza 2008). For example, Mike Adenuga, the Chairman of Globacom, introduced a 9,800 km long submarine cable network across the United Kingdom, Spain, Portugal and 14 African countries in order to establish a dedicated link to the USA. This is the first initiative of its kind to be executed by an individual in Nigeria (Nkanga 2011).

2.5 Research Framework

The literature highlights the challenges that face SMEs when seeking to improve their performance in the supply chain through the use of EcT. On the other hand, the benefits of appropriate technologies can be significant. However, the perceived and actual barriers to implementation are numerous and not all of which lie within the sphere of control of the organisation. SMEs in developing economies may also face specific problems when attempting to coordinate their activities with other inexperienced organisations within the supply chain, and when national infrastructures are not supportive of chosen technologies.

The following hypotheses have been drawn from the themes identified within the literature and form the basis of this investigation:

Hypothesis 1: There is a positive relationship between EcT adoption and perceived relative advantage in SMEs.

Hypothesis 2: The adoption of EcT by Nigeria SMEs will be positively related to the perceived ease of using EcT.

Hypothesis 3: The adoption of EcT by Nigeria SMEs will be positively related to the size of the organisation.

Hypothesis 4: The adoption of EcT by Nigeria SMEs will be positively related to the industry of the organisation.

Hypothesis 5: The adoption of EcT by Nigeria SMEs will be dependent on the position of the organisation in the supply chain.

Hypothesis 6: The perceived ease of use will have positive effect on perceived usefulness of ICT to Nigeria SMEs.

2.6 Methodology

This study employed a self-administered questionnaire to explore the importance of supply chain management in SMEs in accordance with the themes identified in the literature review (Owolabi 2005). Survey research strategy is a widely accepted and common approach in business and management research (Saunders et al. 2007; Bryman and Bell 2011; Panneerselvam 2010). It is aimed at producing generalisations about a population by collecting information from samples. It is used for exploratory and descriptive research and is usually associated with the deductive approach (Thomas 2006; Saunders et al. 2009). Surveys are used as they allow for the collection of a large amount of data from a large population in a highly economical way (Bryman and Bell 2011).

The survey questionnaire was divided into three sections: Sect. 2.1 focused on collecting demographic information about the company. Section 2.2 explored with the use of EcT in the supply chain. Section 2.3 focused on the benefits and barriers of EcT adoption. Questions were answered through a 5-point Likert scale. Some questions include open-ended responses to elicit further detail and accommodate a wider range of responses.

A total of 300 questionnaires were distributed to managers of SMEs in Lagos, Nigeria. One hundred and eighty questionnaires were returned, of which 161 were complete, representing a response rate of 54 %. This sample size is considered adequate for the analysis and the response rate is similar to that of Apulu et al. (2011).

2.7 Analysis and Discussion

There is no single definition of an SME, however, the number of employees is usually used (Modimogale and Kroeze 2011). The Small and Medium Sized Development Agency of Nigeria (SMEDAN) defines a micro enterprise as a business employing less than 10 people and an annual turnover of less than 5 million naira ($30,797), a small enterprise as a business with between 10 and 49 employees and annual turnover of 5–49 million naira ($30,797–$301,819), and a medium enterprise is defined as a business with between 50–199 people and an annual turnover of 50–499 million naira ($307,979–$3,073,636). Analysis of the survey data shows that 63 organisations (39.1 %) were micro enterprises

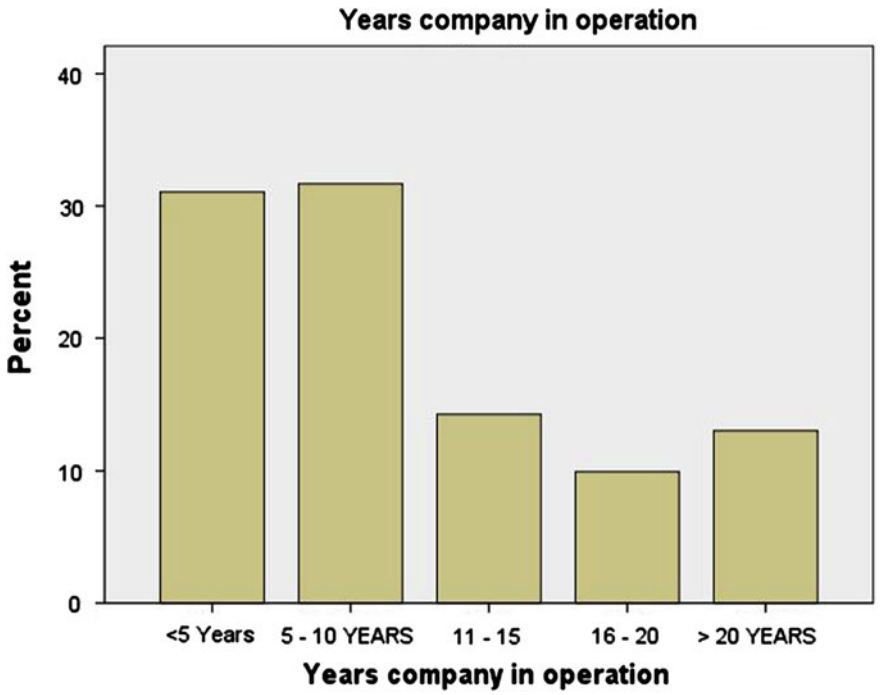

Fig. 2.1 Age of companies

employing less than 10 people, 72 organisations (44.7 %) are small enterprises, and 26 (26 %) are medium sized enterprises.

Figure 2.1 illustrates that 50 respondents (31.1 %) had been in existence for not more than 5 years, 51 respondents (31.7 %) fall within the range of 5–10 years, 23 respondents (14.3 %) fall within the range 11–15 years, while 16 respondents (9.9 %) fall within the range of 16–20 years and 21 respondents (13 %) fall within the range of more than 20 years.

This analysis suggests that SME organisations are a vibrant section of commerce in Nigeria. Small and micro-sized enterprises forming the majority of the sample surveyed. Encouragingly, around one third of those organisations have prospered for more than 10 years.

Thirty first organisations (19.3 %) were private limited companies, 16 organisations (9.9 %) were public limited companies, 27 organisations (16.8 %) were partnerships, 60 organisations (37.3 %) were sole proprietorships, and 26 (16.1 %) were family owned businesses.

A total of 113 organisations (70.2 %) identify themselves as belonging to tier 0, that is supplying directly to the consumer, 35 organisations (21.7 %) were reported as tier 1 and 13 organisations (8.1 %) were reported as tier 2. Figure 2.2 depicts the range of sectors that the survey sample operated in.

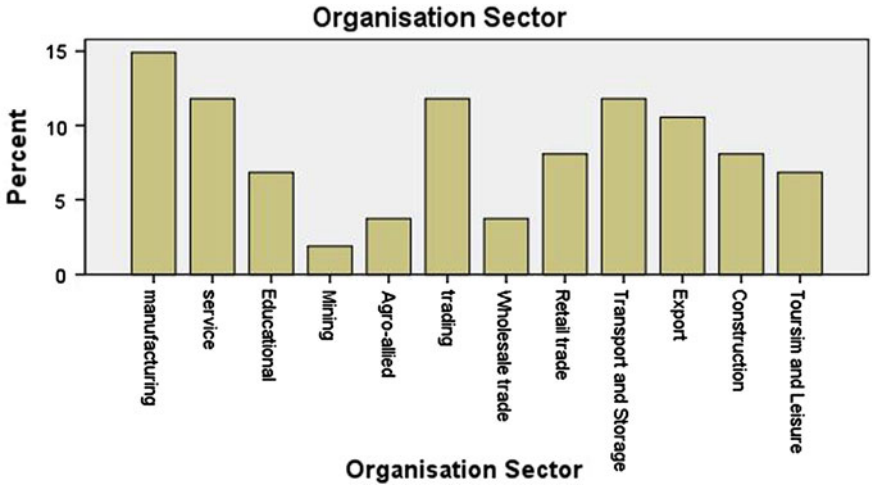

Fig. 2.2 Sectors of commerce

2.7.1 Overview of Hypotheses

An overview of the data analyses and the findings for each of the tested hypotheses is shown in Table 2.1.

Despite making an overall rejection of Hypothesis 1, factor reduction analysis showed that there were strong relationships between EcT adoption and the perceived relative advantages of competitive advantage, cost/time reduction, increased profit and global reach. Contrastingly there was little or no relationship between EcT adoption and the perceived relative advantages of improved marketing, information storage, communication, customer satisfaction and automation. It shows that there are several significant reasons for SMEs to adopt EcT. However it also suggests that Nigerian SMEs are not entirely aware of the benefits that EcT may bring to specific business functions and processes, or fail to consider the details of the ways in which EcT may be able to improve an organisation's efficiency and effectiveness. The SME owners/managers that took part in the survey were asked reasons why they have not adopted EcT solutions. 14 respondents said it was not applicable to their line of business, 12 respondents said it was not economical, 8 respondents said they were not trained to use EcT, 4 respondents said they were not aware of its usefulness while 3 respondents said they had not heard about it.

Perhaps unsurprisingly, Hypothesis 2 shows that there is a strong relationship between the perceived ease of use of EcT and its adoption. This is consistent with the vast corpus of literature that examines EcT adoption in a myriad of contexts. 65 % of the respondents identified the lack of electricity as one of the main factors limiting the utilisation and adoption of EcT and was a notable barrier to its ease of use.

Table 2.1 Summary of hypotheses

Hypotheses	Variables	Significance	Result
Hypothesis 1	EcT adoption and benefits of use	Pearson's correlation (0.069)	Rejected. However, competitive advantage, global reach, increase profit, reduce cost/save time all have a strong correlation with EcT adoption
Hypothesis 2	EcT adoption and perceived ease of use	Pearson's correlation (0.486)	Accepted
Hypothesis 3	EcT adoption and number of employees	Pearson's Chi Square (0.002)	Accepted
Hypothesis 4	EcT adoption and sector of the organisation	Pearson's Chi Square (0.184)	Rejected
Hypothesis 5	EcT adoption and position of company in the supply chain	Pearson's Chi Square (0.335)	Rejected
Hypothesis 6	Perceived ease of use and perceived usefulness	Pearson's correlation (0.547)	Accepted

There are unstable and limited power allocation networks in Nigeria, hence power shedding is a regular occurrence (Olatokun 2006).

For this study, in the context of a developing economy, it is encouraging to find that attitudes toward EcT adoption in SMEs are similar. Although requiring further investigation, along with the analysis of Hypothesis 1 it suggests that Nigerian SMEs' understanding of EcT is reasonably well developed. It is worth mentioning that most SME managers/owners had received EcT training privately (43.5 %) followed by managers/owners who had their training from friends (18 %) and from the government (17.4 %).

In accord with much of the literature Hypothesis 3 finds a strong relationship between the size of the company and the adoption of EcT. From our sample, of the respondents that were micro-scale enterprises, 74 % had adopted some form of EcT, while 94 % of small-scale enterprises and 92 % of medium-sized enterprises had adopted information technologies. Although there does not appear to be a linear relationship between size and adoption, the analysis does suggest that smaller firms find it particularly difficult to adopt EcT.

There is a perspective that believes older organisations (over 20 years old) may be more willing and able to adopt EcT solutions compared to new organisations (5–10 years old) as their financial positions become secure, their awareness of the market improves and their employees' skills increase. However, the study showed that new organisations (34 %) seem to have adopted EcT solution to a greater degree than the old ones (14.9 %). There may be several reasons for this, ranging from increased EcT awareness of younger managers to increasing competition between organisations as newer ones enter the market.

The sample that was surveyed encompassed a broad range of sectors of commerce (Fig. 2.2) but no relation was found between this and the adoption of EcT for Hypothesis 4. The manufacturing sector was found to have the highest figure of EcT adoption (17.0 %) followed by transport and storage (12.1 %) then trading (11.3 %).

Interestingly, no statistical relationship was found between the adoption of EcT and an organisation's position in the supply chain for Hypothesis 5. However, in the sample 97 % of tier 0 companies had adopted some form of EcT compared to 31 % of tier 1 suppliers and 13 % of tier 2 suppliers. This is compelling evidence that there is in fact some association between the adoption of EcT and the position of a company in a supply chain that is worthy of further investigation. Responses to open-ended questions indicated that tier 0 companies adopted and utilised EcT extensively for communication with end users.

The strong relationship found for Hypothesis 6, similar to that for Hypothesis 2, confirms much of the existing literature. The perceived ease of use of EcT solutions will have a positive effect on the usefulness of EcT to Nigerian SMEs. The poor service provided by Internet Service Providers (ISPs) was seen as a major concern by many respondents. This is characterized by slow internet speed due to low bandwidth and high subscription costs. Thus, ISPs need to enhance the quality of services they provide to their customers, especially regarding bandwidth, as this will assist SMEs to effectively utilise and adopt EcT solutions.

Table 2.2 Advantages and disadvantages of e-commerce for Nigerian SMEs

Advantages	Disadvantage/barriers
E-commerce aids business development in developing countries	Internal Perception of security and reliability
Improved business communication and co-ordination- facilitates globalisation	Internal SMEs resources: skills, awareness of benefits, culture
It helps reduce cost of business operation; transaction, procurement, and materials costs	Internal and External Data integrity and protection
Minimizes issues associated with logistics	External Infrastructure: power supply security, internet, funding
Reduces cost of production	
Easy online comparison	
Better customer service, quicker response	
Supports economic development	

Corruption was highlighted by 53 % of the respondents as one of the factors limiting the successful utilisation and adoption of EcT. Corruption in Africa is a problem of routine deviation from established standards and norms by public officials and parties with whom they interact (Ayobami 2011). Bribery, private gain and non-existent workers, also known as 'ghost workers', are some of the different types of corruption that are encountered. Corruption generally in Nigeria is a social problem that has attracted the interest of many scholars. However, corruption and its effect on e-commerce have experienced little attention. The lack of infrastructure and the high cost of equipment were also identified by many of the respondents as other factors affecting the adoption of EcT (Table 2.2).

The growth of e-commerce is held back by lack of public awareness on how to use the technologies. However, there has been a rapid growth in electronic cash transfer services such as Western Union, MoneyGram and Travelex in recent years. Electronic banking is one area of e-commerce that has proven successful in Nigeria. Virtually all banks in Nigeria offer online, real-time banking services. Moreover, banks that cannot offer these services are increasingly losing their customers are offered the flexibility of operating an account in any branch of their bank's network. Even though the Nigeria government has taken progressive steps in recent years to aid online buying and selling many challenges still remain. Among these, corruption appears to be a widespread issue (Akpan-Obong 2007; Olusegun et al. 2006).

2.8 Conclusion

SMEs are known to be the backbone of the economies in developed and developing countries. Nigeria in particular has advanced immensely through the numerous benefits that SMEs provide. Cost reduction, increased flexibility, error

reduction, faster response time and lower cost of labour are some of the benefits that EcT adoption offers. In spite of this, challenges still exist that inhibit effective integration.

There is a need for both managers and employees to undergo continual training in order to be aware of the vast changing nature of EcT and to find the most suitable solution for their organisations. The lack of security and reliability, trust, and access to capital are some of the factors responsible for the slow adoption of EcT within the SME sector in Nigeria.

This study also identified poor infrastructure to be a significant issue that affected the adoption of EcT and continues to affect the effective long-term utilisation of EcT solutions. In addition to this, corruption appears to be a key issue of debate and concern.

There would appear to be a need for both SMEs and government institutions to cooperate to address these pressing problems. Organisations ought to ensure the readiness of their employees for change that is brought about through EcT solutions. This should not just be restricted to their employees but should recognise the multiplicative effect of appropriate EcT adoption throughout the supply chain. Infrastructure development needs to take place to complement the development of SME-based commerce. The cost of these undertakings should be considered in light of the considerable importance of SMEs to the economy. Corruption is a perennial problem in some areas and does not seem to be an issue that can be simple to resolve. Nevertheless, ignoring the problem is unacceptable given its reported magnitude.

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Chapter 3
Rationalising the Security Concern of Cloud Enabled E-commerce in the Supply Chain Context

Olatunde Amoo Durowoju

Abstract Enabling e-commerce operations on the cloud platform takes the responsibility of IT away from the user. This has several advantages making it a promising opportunity. However there are several uncertainties or barriers to adoption of Cloud Computing and it is therefore advisable for organizations to select cloud partners based on how responsive they are to uncertainties in the cloud. The single most pertinent concern, according to most authors, is information security and cloud service providers (CSPs) should be assessed based on their commitment to security, evidenced by their security profile. This study posits that the security profile of CSPs has potential cost implication to the user and this can be used as a performance criteria in cloud partner selection. With the use a simple simulation model and entropy analysis, this study has shown that users should be wary of CSPs with higher disruption duration profile than those with higher breach recurrence rate profile. In addition, the level and type of information required to manage and control the system would differ based on the security profile of the CSPs. Those with high disruption duration profile would worry more about the extent of negative impact when a breach occurs and those with high breach recurrence rate would worry more about the impact being negative or positive.

Keywords E-commerce · Cloud service adoption · Security breach profile · Entropy assessment

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3.1 Introduction

One of the appeal of e-commerce is the fact that it can be leveraged with the use of the internet instead of having proprietary licence which connects only a few in-house players and are generally expensive to own and run. The internet has been employed in multidimensional and multifaceted ways in various supply chains. Irrespective of the type of supply chain, the internet has proven to be limitless in the purpose it can serve provided its use had been carefully or strategically planned. Its use has ranged from communication information exchange (Lancioni et al. 2003) to more operational related functions (Chen and Meixell 2003) such as order filling, purchasing, human resource management etc. The emerging concept of Cloud Computing is a somewhat recent development in the way e-commerce is being leveraged via the internet. Cloud services purports to bring flexibility, configurability, cost effectiveness, low implementation cost to IT and by extension, supply chain management (SCM). Many IT experts and academics have reported a plethora of benefits an organization stands to gain if and when they avail themselves to this opportunity. In the same vein there has been a series of counter argument about the purported benefits of joining the cloud. However, as is common to most IT initiatives, a careful analysis of how it will affect one's internal and external business environment must be undertaken before adopting this e-commerce strategy, otherwise it can be the bane of a business existence. Top amongst these counter arguments are the issues of security (Subashini and Kavitha 2011) and ability to scale up or down computing resources as needed without making service unavailable (Armbrust 2010).

Most of the past reports on cloud computing/cloud services have been viewed from the cloud provider's perspective. The few ones examining it from the users' perspective have been largely based at an organization level. Only a handful have examined these issues at a supply chain level. A previous study (Durowoju et al. 2011) proposed an approach, which incorporates a system thinking perspective, to investigate how some of these issues, especially security and scalability, affect businesses at an organizational level and supply chain level. By looking at the impact of these variables on supply chain performance, the research posits that this will inform an appropriate cloud computing adoption strategy to suit the overall organization and supply chain management goal. This chapter therefore draws on the previous work by Durowoju et al. (2011) and rationalises why organisations are wary of leveraging their e-commerce operation in the cloud and propose how the cloud adopter can assess the security level of the cloud service provider, as security is the single most important fear factor in cloud adoption.

3.2 E-commerce and the Cloud Computing/Service Strategy Service

The emerging trend of enabling e-commerce systems on the platform of cloud computing has been a subject of discuss in recent years. It is easier to understand the concept and how it can be successfully adopted when we define it according to its functionality as well as its applicability. The functional definition can be seen as cloud computing while the applicability definition can be seen as cloud service. Its applicability would entail seeing this concept being delivered over different service configurations. There are three basic service configurations also known as cloud service models which are Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS). In SaaS, the cloud user buys the right to use a working application hosted by an external provider via the internet. The PaaS model involves the use of an externally provided infrastructure to host the application, while IaaS model requires the use of servers provided externally for raw computing, storage and network transfers (Durkee 2010; Subashini and Kavitha 2011). We can also look at the scope of the service whether it is purely open to the public (Public Cloud) or restricted to certain users (Private Cloud) or a combination of both (Hybrid Cloud). Some have argued that the cloud concept cannot be anything short of public access since cloud by definition entails external providers in an open computing environment (Ryan 2011; Orange and Cohen 2009). Although private clouds purports to have tighter security and boast greater reliability, they are argued to be quite costly and lack the financial incentive to encourage small to medium firms to adopt (Orange and Cohen 2009). This in principle defies the concept of the cloud. A purely functional definition of cloud computing is that it is a way of accessing hardware or software resources, or a combination of both, anywhere in the world by an organization or an individual via the internet (Amir 2009; Smith 2009; Armbrust 2010). These resources are shared amongst many users, abstracted, available on demand, scalable, and configurable (Marston et al. 2011). We however accept the definition offered by (Seccombe et al. 2009) describing cloud computing as "the use of a collection of services, applications, information, and infrastructure comprised of pools of compute, network, information, and storage resources. These components can be rapidly orchestrated, provisioned, implemented and decommissioned, and scaled up or down; providing for an on-demand utility-like model of allocation and consumption."

3.2.1 Purported Benefits of the Cloud Computing Strategy

Cloud computing have several benefits over traditional IT models reported in literature. Cloud services bring flexibility, configurability, cost effectiveness, low implementation cost to IT and SCM. Primarily it offers a cost advantage to firms

especially the small to medium scale enterprises who otherwise cannot afford the huge financial commitment required for deploying typical cutting edge enterprise-level IT systems such as Enterprise Resource Planning (ERP) systems (Marston et al. 2011). This is achieved through the metering system based on the notion of "pay as you go".

As is the pattern for most firms, technology adoption is preferably done in a stepwise manner so as to be able to discontinue its use when it is proving ineffective in delivering the anticipated benefits without any major impact on the firm's operations. Various hardware and/or software resources can be combined, separated and recombined by organizations as they so please. Thus an organization might purchase specific software components from Oracle, SAP, Apple or any other software provider and link them together via the cloud to create a business solution (Amir 2009). This configurability in the cloud makes it a more attractive solution to many businesses than other IT models such as stand-alone web services. Another benefit is the scalability feature that it has. As demand for computing changes, the necessary computing power can be dynamically increased or decreased to meet the change in demand. Thus organizations can pay for what is needed and get rid of unnecessary resources. All of these make computing in the cloud very attractive and allows for flexibility in the way business is conducted. This concept has been extended to manufacturing where product design, manufacturing, testing, management, and all other stages of a product life cycle are encapsulated into cloud services and managed centrally (Xu 2012). Other benefits includes taking away associated costs of IT such as; system upgrades; recruiting and training IT staff; equipment delivery and installation; or modification of IT facility, from the Cloud user (Smith 2009). It also helps to prevent the loss that would otherwise be incurred when an organization is unsuccessful in deploying an expensive in-house information system (IS). This is because its flexible feature makes it possible to change from one cloud service provider to another without any major cost to the user. If a service provider does not deliver an agreed level of quality of service (QoS), the service user may change to another provider offering a better or even cheaper service. These advantageous features of Cloud computing can help organizations or supply chains to be lean, agile or le-agile, responding effectively to demand. Furthermore, the result of an information security survey by Ernst & Young (2011) reveal close to half of the total number of respondent from 56 countries have either deployed or are evaluating cloud computing. This suggests significant amount of organisations are now using or close to adopting cloud computing which in a way puts pressure on others to follow suit.

3.2.2 Concerns for Cloud Service Adoption

As there are benefits for adopting cloud service, so are there concerns. These concerns come under the broad headings of security (Hitchings 1995; Kim et al. 2011; Rees et al. 2011; Subashini and Kavitha 2011; Ulrich and Oliver 2008;

Warren 2000; Whitman 2003; Ryan 2011), quality of service (Durkee 2010), service availability (Smith 2009; Armbrust 2010; Son and Kim 2004), data liberality (which we also termed here as migrability which means ease of moving data from one provider to another) (Armbrust 2010; Fitzpatrick and Lueck 2010) and scalability (which refers to ease and speed of provisioning and de-provisioning) (Marston et al. 2011; Dutta and Vandermeer 2011). The ease of increasing or reducing computing power and quickness at which this can be done at the level of automation is very important. The more time is spent trying to increase the level of resource provisioning to cater for sudden increase in demand, the longer the delay in completing the task and hence, higher risk of loss of business (Armbrust 2010; Dutta and Vandermeer 2011). An inactive computer consumes two-third of the energy consumed by an active computer (Armbrust 2010) and service providers are frantically considering ways to optimize server and VM utilization. A number of studies have looked at the performance of servers under different configurations and scheduling schemes. According to Yang et al. (2006) using a singer server for provisioning user request would mean that the server requires upgrading each time demand for it increases beyond its capacity and this can be complex and costly. Ng et al. (2003) proposed that an alternative solution would be to have several servers that provides for a scalable server class which handles provisioning by allocating additional server when required. Gautam (2002) studied the optimal number and location of proxy servers to minimize cost subject to delay throughput and demand constraint. At a more specific level, Son and Kim (2004) examined the optimal number of servers of a particular server class in an online transaction processing client/server environment. Dutta and Vandermeer (2011) described why existing cost-optimal allocation strategies cannot be directly applied to a middleware virtualization. This argument is applicable to cloud services as servers could be located at different locations and used to provision any resource requirements of the users.

A summary of the opportunities organisations can avail themselves to when they enable e-commerce operation in the cloud and the various factors that make adopters apprehensive about adoption is presented in Table 3.1. Although a huge concern to most users is availability of service, this problem mostly rise from issues with security breach or inability to provision for needed resources. With the assumption that there is dynamic allocation of resources to users' request, the main concern would be the safety or protection of one's data, application, or transactions being done in the cloud. Security concerns as it relates to information sharing are privacy, protection of proprietary information, preservation of the quality of information. In Durowoju et al. (2011), security was conceptualized as one of the uncertainties present in the cloud. It was defined as the level of defence against IT threats as evidenced by the probability of breach occurrence and a breach was defined as the incidence or occurrence of a particular IT threat[1] compromising the

[1] An event or action that can potentially inflict harm or damage to the functioning of an IT system.

Table 3.1 The opportunities and threats to cloud computing adoption

Propellants for adoption	Barriers to adoption
Elasticity/scalability the ability to scale IT infrastructure requirements both up and down rapidly	*Corporate culture shock* going from internal provision to external provision
Flexibility ability to purchase software components from oracle, Apple, SAP etc. and combine it to form a business solution	*Quick provisioning* being able to scale computing resources up or down at the level of automation
Pay-as-you-go pay-per-use basis versus install-and-own	*Loss of control* managing IT infrastructure through service level agreements (SLAs) with CSPs
Cost savings reduction in IT operational cost	*Information security* How safe is your information and data from security threats?
Stepwise adoption ability to decompose an entire technology into piecemeal sizes and gradually adopt it in stages	*Privacy concerns* safeguarding personally identifiable information of employees, business partners and customers and meeting legal and ethical requirements regarding privacy regulations
Infrastructure utilization virtualization of hardware and software resources as a service to multiple users simultaneously	*Regulatory compliance* conforming to the regulations of the part of the world where hardware and software is located
Reducing market barrier reduction of IT barriers to market entry. IT that was unaffordable before can now be utilised over the cloud	*Specificity* has to do with compatibility issues and data lock-in
Security delivering "security as a service"	*Lack of standards* lack of commonality in interoperability among cloud providers and between enterprise systems and cloud services

integrity, confidentiality or availability of information needed for daily operations. Rees et al. (2011) described three types of losses an organization faces when they experience data breach: damage to a company's image, regulatory fines e.g. fines paid to Health Insurance Portability and Accountability Act (HIPAA) due to non-compliance to regulation, and production losses as a result of disruption in production's IT support. The average cost of the worst incidence of security breach in 2012 was between £110 k and £250 k for large organizations (>250 staff) and between £15 k and £30 k for small organizations (<50 staff) (Potter and Beard 2012).

3.2.3 The Supply Chain Scenario

If we consider a scenario where a supply chain contains the retailer, distributor, manufacturer and supplier and we know that information about demand flows from the retailer through the chain to the manufacturer, which uses this information to

place order to its supplier. Depending on the level of integration, partners can access this information once they have access to the internet and plan their operations effectively in a timely manner. If we assume that the system which the retailer uses in capturing demand is enabled on the cloud and the demand or customer information is saved on the cloud. Intuitively we know that once this system is compromised due to the fact that the cloud provider experienced security attack or request overload that makes service unavailable, the other parties in the supply chain would be denied the advantage of knowing demand as it occurs or even denied access to real demand information because the data has been corrupted. Consequently, they may result into using forecasted demand to place their orders with their suppliers and cannot take advantage of having timely demand information. Bourland et al. (1996) revealed that a supplier could reduce inventories and its associated costs or improve the reliability of deliveries to its customers given more accurate demand information. Although cloud computing promises low cost in sharing timely demand information in the supply chain when compared to traditional computing, this promise comes with an increased risk.

On the other hand if a system, enabled in the cloud, with a customer interface, which allows a customer to place order to the retailer or manufacturer directly, becomes unavailable due to security breach, or crashes due to a sudden increase in the number of customers accessing the interface at the same time. The organization or supply chain might lose that customer depending on the severity of the incidence. Severity here means the duration of the breach and the number of repeated occurrence. According to Hoffman and Lowitt (2008), retaining one's customers is critical to survival of an organization, let alone growth. If we assume, hypothetically, that a web service where customers are able to place their orders online is compromised and has become inaccessible to customers. This in effect will result in the customers defecting to use services provided by competitors. The customers are classified into two categories which are the 'loyal customers' (which are those accustomed to the use the service and regularly patronize it) and the 'likely customers' (which are trying the service for the first time and are looking for a reliable service to stick to). From Capraro et al. (2003) and Hennig-Thurau and Klee (1997) we understand that loyal customers are still likely to purchase from vendors despite incessant dissatisfaction. However, a research conducted by Accenture revealed that 70 % of US retail customers are loyal customers and that 85 % of these "loyal" customers are willing to shop elsewhere if properly enticed (Hoffman and Lowitt 2008). In other words, there is an 85 % chance they could defect. Inaccessibility to service might be the defecting factor which would cause 'loyal customers' to defect and 'likely customers' to permanently defect. The breached organization would then have to spend more money on promotional packages, among other things, to win back customers.

The objective of any organization or supply chain would be to reduce the number of occurrence of security breach or totally eradicate it if possible. We can understand from the above that there is an 85 % chance of losing customers or customer transaction if they experience incessant dissatisfaction which can be caused by security breach of the system. In practice, one way of calculating the

risk to an organization is by multiplying the probability of incidence (P) of the risk by the impact cost (I) incurred when that incidence occurs (Rees et al. 2011; Deane et al. 2009). We can say that the higher the probability of an incident occurring the greater the cost impact and vice versa. For instance if the cost incurred when an incidence occurs is £20 k and the probability of occurrence is 0.5, then the risk impact is £10 k. If the probability of occurrence reduces to 0.1 due to counter-measures put in place, then the risk impact becomes less, £2 k. In the same light, if there is an increase in the probability of incidence then the risk impact increases. In essence once the cost impact (I) is established, then all that requires monitoring is the probability of incidence (P). Ideally any preventive or mitigating measure would be to reduce the level of occurrence of these breaches (i.e. P) and any recovery measure would be to reduce the impact cost (I). However there is still a conundrum yet un-tackled. The pre-estimated impact cost is in itself uncertain. For example, the impact of a security breach may vary depending on the time of the year it occurs. It is expected that the same breach occurring during peak demand periods will have more cost impact than when it occurs during the less busy periods of the year. Therefore this uncertainty needs to be reflected in the risk calculations. A very well established means of estimating uncertainty is the entropy theory which is discussed in the subsequent section.

3.3 Assessing the Security of the Cloud Provider

A survey done by PricewaterhouseCoopers in conjunction with Infosecurity Europe, under the auspices of the Department for Business Innovation and Skills (BIS), called The Information Security Breach Survey (ISBS) 2012 reported some security breaches experienced by various organizations. These include: Systems failure or data corruption; Infection by viruses or malicious software; Theft or fraud involving computers; other incidents caused by staff; attacks by unauthorised outsider including hacking attempts (Potter and Beard 2012). These breaches can be grouped under internal-based, external-based or platform-based. The internal based security breaches are those resulting from deliberate or in deliberate actions of staff and members of the organization. External—based breaches include those perpetrated by outsiders who are not members or staff of the business. This security breach can be worm; virus or malicious software attack. It can also be password sniffing/cracking software; spoofing (either IP spoofing or web spoofing) attack, denial of service attack (email bomb attack or Ping O'Death), or direct attack (hacking) (Warren 2000). Lastly the Platform-based incidences are caused by the service provider. Examples of this include; systems failure or data corruption resulting from poor resource management or over committing computing resources (Durkee 2010), policy violations or physical damage or theft of the resources.

The onus of ensuring adequate security falls on the cloud user, the cloud provider and any third party security provider. However this chapter is interested in evaluating the level of security a cloud service provider (CSP) is able to offer as

this is one of the main sources of apprehension in adopting the cloud strategy. A CSP should be assessed based on their past and current ability to prevent security breach from occurring and on how quickly they are able to correct and restore the functionality of the system after experiencing a compromise. This assessment can be carried out by profiling the security threats facing the CSP and this can be done by asking the CSP for information relating to the history of security breach incidence that has occurred in the past. A profile of the threats facing the CSP should include the duration of the breach when it occurred (also called disruption duration) and how often they occur (i.e. rate of breach occurrence).

The best solution to information security problems of course would be to have appropriate levels of prevention and deterrence; detective and recovery, and corrective measures. Disruption duration is a function of level of security breach corrective measures (otherwise called mitigation measures). Higher breach disruption duration means corrective level is not high enough. Lower disruption duration is indicative of having near appropriate level of corrective measures. On the other hand, rate of breach occurrence (RoC) is indicative of the required level of security breach prevention and deterrence measures (otherwise called prevention measures). Higher RoC means the preventive and deterrence measure is not at an appropriate level, and lower RoC means that the level of breach prevention and deterrence is high.

To demonstrate how the security level of the CSP can be assessed, simulation modelling is used and the approach for entropy assessment used in Durowoju et al. (2012) is applied. While the direct cost impact of a security breach on two different organisations/supply chains might be the same, the level of uncertainty associated with such impact may not be the same due to the different complexities of both organisations/ supply chains. In other words, the direct cost impact when the breach occurs at another period in the same year might be different for both organisations/supply chains. It is therefore necessary to capture this uncertainty and this can be done using entropy approach.

In a previous study, Durowoju et al. (2012) adapted the two models proposed by Sivadasan et al. (2002) to security breach uncertainty assessment. The first model is SINC depicted in Eq. (3.1) which is the uncertainty associated with not knowing whether there would be a negative impact or not, that is the 50/50 chance of a negative impact. This is also called the nature uncertainty.

$$OCI\left(\mathrm{S}^{\mathrm{INC}}\right) = -P\log_2 P - (1-P)\log_2(1-P) \tag{3.1}$$

where P is the probability of a negative impact.

The second is the SNC depicted in Eq. (3.2) which is the uncertainty associated with the number of countable states of the impact when it is negative. This is also known as the uncertainty associated with knowing the 'extent' of the negative impact (extent uncertainty). Higher scores occur when the impact is spread over several countable states, and lesser scores occur over fewer countable states.

$$OCI\left(\mathrm{S}^{\mathrm{NC}}\right) = -(1-\mathrm{P})\sum_{\mathrm{j}=1}^{\mathrm{M}}\sum_{\mathrm{i}=1}^{\mathrm{n}}\mathrm{P}_{\mathrm{i/j}}\log_2\mathrm{P}_{\mathrm{i/j}} \tag{3.2}$$

where $P_{i/j}$ is the conditional probability computed over the "not in control" state with states i ($i = 1,\ldots, n$) at nodes j ($j = 1,\ldots, M$).

The sum of Eqs. (3.1) and (3.2) is the total entropy (TE). It follows that the higher the total entropy value, the higher the uncertainty introduced by the breach into the system and hence the more the associated information needed to manage the system and vice versa. Therefore entropy assessment provides an indication of the detective and recovery control level (otherwise called monitoring and review control level) required. Consequently, higher monitoring and review controls would be needed in a supply chain with high uncertainty level while lower control levels would be required in one with low uncertainty. According to a guide written in 2010 by a group of the leading risk management organisations in the UK, The association of insurance and risk managers (AIRMIC); public sector risk management association (Alarm); and the institute of risk management (IRM), the need for monitoring and review is to ensure that that organisation can learn from past experience by monitoring risk performance (AIRMIC, Alarm & IRM 2010) and so they can reduce or eliminate future occurrence of a breach.

3.4 Profiling Security Breach in the CSP Context

To illustrate the approach, the information on system failure and data corruption (SFDC); attack on website or internet gateway (AOW); and Infection by malicious software (i.e. a virus, worm, Trojan or spyware) (IBMS), extracted from the 2012 Information Security Breach Survey (Potter and Beard 2012) was used. The survey was an online self-select survey with 447 respondent organizations. The respondents were security professionals. The three security threats were profiled based on the average service disruption duration caused by the breaches as well as the frequency of occurrence (RoC) and this can be found in Table 3.2. SFDC was characterised as a breach with average disruption period of 5 days with an average of three occurrences per year. According to the survey, the average disruption period for AOW was 1 day with an average occurrence of fifty four times a year and that of IBMS was 1 day disruption duration with an average of three occurrences per year. Therefore IBMS may be classified as a less disruptive and less recurring breach and this profile is called breach profile 1 (BP1). AOW may be termed a less disruptive breach but highly recurring and this is classed breach profile 2 (BP2). SFDD may be classified as highly disruptive but less recurring breach and this is tagged breach profile 3 (BP3). BP1 has the same breach recurrence rate as BP3 but BP3 has significantly higher disruption duration than BP1. Hence the effect of having a higher Disruption duration can be assessed when you compare the impact of BP1 To that of BP3. In the same light BP1 has the same

Table 3.2 Security Breach Profile (Computed from ISBS 2012)

Breach type	Average disruption length (days)	Average occurrence/year
System Failure and Data Corruption (*SFDC*)	5 (Long disruption duration)	3 (Low occurrence rate)
Attack on the Web (*AOW*)	1 (Short disruption duration)	54 (High occurrence rate)
Infection by Malicious Software (*IBMS*)	1 (Short disruption duration)	3 (Low occurrence rate)

disruption duration with BP2 but BP2 has a significantly higher recurrence rate than BP1. Consequently the effect of having a higher recurrence rate can be assessed when the impact of BP2 is compared to that of BP1. It is important to reiterate at this point that the disruption duration and recurrence rate of each breach type were derived by computing the average of all the values reported by several organisations. A cloud user or group of users would require this information in the context of the cloud service provider.

3.5 Illustration with a Simple Simulation Model

The simulation approach and the parameters used is the same as those described in (Durowoju and Chan 2012). In the simulation model, the supply chain is a serial type and consist of a retailer, wholesaler and manufacturer, each acting as an independent agent. The assumption is that each agent uses the continuous review EOQ policy. The profile information of the three breaches were incorporated into the simulation model as a deterministic model. The simulation parameters for this illustration is shown in Table 3.3. The demand follows a normal distribution with mean of ten units and a standard deviation of two units and it is experienced at the end of the day. The simulation was run for 800 days. Using the time series method (Kelton et al. 2010), the warm—up period was set to 100 days, resulting in an effective period of 701 days and the average statistics were computed over this period. Using the confidence interval method described in Law (2007), the number of replication was determined to be 45 at 98 % confidence level and the same random number streams were used for each breach scenario to ensure consistency and variance reduction (i.e. reduce randomness effect) (Kelton et al. 2010).

3.6 Result and Discussion

To estimate the impact of security breach, the performance in the breach scenario is compared to the performance in the non-breach scenario.

Table 3.3 Simulation parameters

Parameter	Value
Demand (units)	NORM(10, 2)
Demand arrival	End of day
Production lead time	3 days
Manufacturer capacity	80
Transportation lead time from wholesaler to retailer	2 days
Transportation lead time from manufacturer to wholesaler	5 days
Retailer unit holding cost, backlog cost, Ordering cost	$5, 10, 5
Wholesaler unit holding cost, backlog cost, ordering cost	$3, 10, 5
Manufacturer unit holding cost, backlog cost, production cost	$3, 10, 5

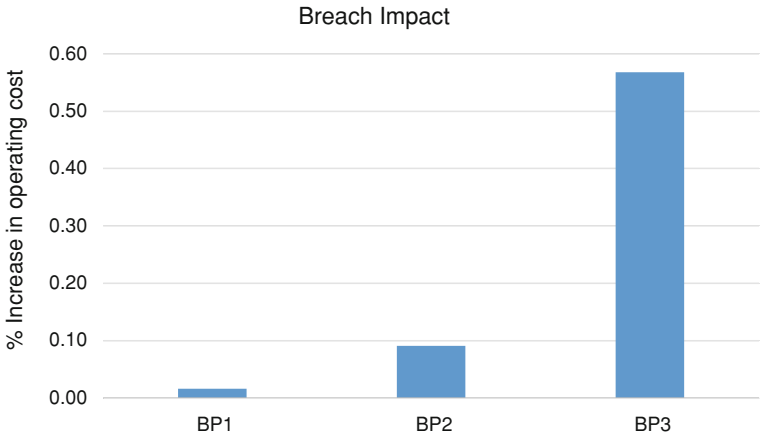

Fig. 3.1 Impact of the three breach profiles on supply chain operating cost

3.6.1 Cost Impact

First the difference between the cost performances in both scenarios is calculated. The magnitude of the difference between the cost performances of both scenarios is then expressed as a percentage of the cost performance in the non-breach scenario. This percentage difference is termed 'Breach cost impact'. This computation is done for the three breach profiles and the result is shown in Fig. 3.1.

Adapting this result to a CSP assessment context, a CSP with security profile similar to BP1 would have less cost impact on supply chain operations while a CSP with a BP3 nature would have the highest impact of the three. Therefore a cloud user or groups of users would opt for a CSP with BP1 type. Since BP1and BP2 only differ in terms of rate of recurrence (RoC) and BP1 and BP3 only differ in terms of the disruption duration, the effect of RoC and disruption duration can also be used a criteria for assessment. It is seen from the result that RoC does not increase the breach impact cost as much as higher disruption duration does.

Therefore users should be more wary of CSPs with high disruption duration profile than those with high recurrence rate profile. The advice would be to select CSPs whose past breach disruption duration is low. This means that the CSP has appropriate levels of corrective measures and would be able to restore the services when a security breach has occurred very quickly.

3.6.2 Uncertainty Impact

The level of uncertainty expressed as the Total entropy was also calculated using the approach described earlier and the result is shown in Fig. 3.2. Recall that the uncertainty measured here has to do with being sure that the breach impact cost above, computed at 98 % confidence level, would remain the same if it occurred at any other time in the year. Therefore from the result in Fig. 3.2, the uncertainty associated with cost impact of BP1 is the highest while that associated with BP2 is the lowest. However when we decompose the result in Fig. 3.2, a better picture of where the uncertainties lie would be seen. The reason for this decomposition of entropy analysis is to be able to answer the following questions with some amount of certainty once the average cost impact is estimated. The first question is; what is the nature of future impact? Will the next breach incidence have a positive or negative impact on cost performance given the complexity of the supply chain? If positive then, there is no cause for concern. However if negative, then the next question is to what extent will it be negative? Table 3.4 shows the result of the entropy values of the two models described in Sect. 3.3. It is seen from the result in the table that the type of uncertainty associated with a BP1 is only of the nature type (with a value of 5.7) and that of the extent of negative impact is zero. For BP2, the concern is also for the nature uncertainty (with a value of 4.1) while the extent uncertainty is low. The concern of BP3 on the other hand is extent uncertainty (with a value of 4.0) while nature uncertainty is of a lesser concern (with value of 1.3). The consequence of the result is that for BP1, the cloud adopter is not certain that future breach of the CSP will be negative or positive but can be sure that any negative impact will not exceed the average value estimated in 6.1. The implication of the entropy result for a BP2 is similar to BP1 but for BP2, the uncertainty is lower for nature impact but slightly higher for the extent of negative impact than in BP1. For BP3, there is lower uncertainty of predicting future impact whether it will be negative or positive than BP1 and BP2, however the cloud adopter is less certain of how big the negative impact is going to be in the future. Taking BP1 as the basis for comparison, we find that increasing the recurrence rate (as in BP2) significantly reduces the nature uncertainty but slightly increases the extent uncertainty. However, a significant increase in the disruption duration (as in BP3) significantly reduce the nature uncertainty but significantly increase that of the extent uncertainty.

The more certain you are of a negative impact the more convinced you are that a risk mitigation strategy is needed. However the less certain you are the less

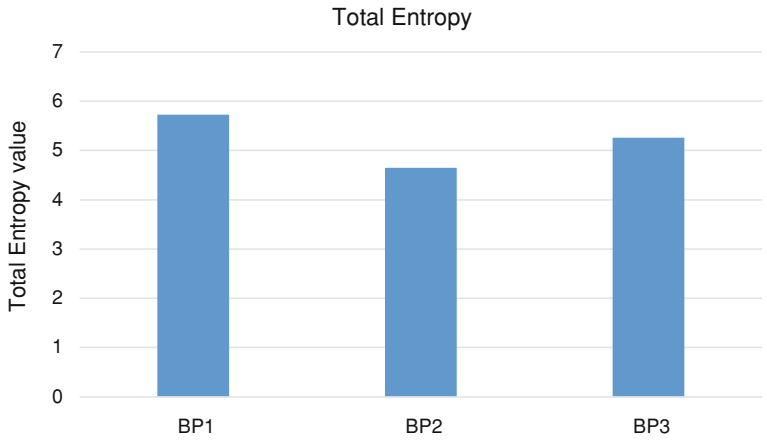

Fig. 3.2 Total entropy value for each breach profile

Table 3.4 Entropy values based on the three breach profiles

Uncertainty type	BP1	BP2	BP3
Nature uncertainty (SINC)	5.7	4.1	1.3
Extent uncertainty (SNC)	0.0	0.5	4.0
Total uncertainty (TE)	5.7	4.6	5.3

convinced you are on implementing any risk mitigating or corrective action which could be unwise in the long run. According to a survey by Mitroff and Alpaslan (2003), proactive businesses existed for an average 16 years more than their reactive counterpart. The author surmise that this is perhaps due to the fact that the reactive ones were not certain of experiencing negative impact and therefore were not proactive about putting proper mitigation strategy in place and this of course would increase the disruption duration caused by the breach. It is therefore of the essence to increase the certainty level of breach impact so that the necessary corrections or implementation can be put in place to avoid unprecedented future impact. Ideally the cloud adopter would like to be free of uncertainty and to do this, the level of monitoring and review effort of the CSP has to be increased. Increasing this effort could mean extra cost which one may argue is not justified as the future is uncertain in itself. Organisations and even CSPs have been complacent especially when the impact of a breach is low or when they have never experienced it before. Therefore CSPs and even businesses refuse to implement appropriate risk control strategies. On the other hand, bridging the uncertainty gap is important in supply chain as according to Mitroff and Alpaslan (2003) in Altay and Ramirez (2010), 95 % of Fortune 500 companies are unlikely to be able to manage a disruption that the company has not experienced before because they are ill-equipped. Being caught unawares or ill-equipped could be the bane of existence for most supply partners.

3.7 Conclusion

There exists a need to examine the impact of enabling e-commerce in the cloud on business operations and treat it as a strategic tool rather than merely 'the new way of computing'. As like many other IT concept, its adoption must be duly informed, otherwise it may spell disaster for whosoever rushes into it. A good understanding of the internal and external business environment coupled with an understanding of the pertinent concerns over moving to the cloud would be the bedrock of successful adoption of cloud service. Majority of the authors on cloud computing agree that security and scalability are the two most important factors to consider. However, the single most pertinent concern according to several authors is information/data security. Durowoju et al. (2011) have considered these two factors and suggested two different approaches to assess them. This chapter however focused on the security aspect as this is the main concern if we assume that scalability is part of the cloud computing definition and is therefore a given. Using appropriate illustration this chapter has demonstrated why and how a cloud adopter should assess the security offering of a cloud service provider. It has been shown using a simple simulation example that cloud users should be more wary of CSPs with high disruption duration profile than those with high recurrence rate profile. The entropy assessment revealed that when the recurrence rate of the CSP' security breach profile is increased significantly, the impact cost on the cloud adopter is increased and the nature uncertainty is decreased while the extent uncertainty is slightly increased. However when the disruption duration of the CSP' security breach profile is significantly increased, the impact cost on the cloud adopter's operation is highly increased and the nature uncertainty of the future impact is significantly reduced while the extent uncertainty is highly increased. Consequently, CSPs with high breach recurrence rate profile would require increased level of information or control measures to be able to predict future cost impact whether it would be positive or negative but do not need more information to be sure what the extent of negative impact will be as this is known with reasonable certainty. On the other hand, CSPs with high disruption duration profile need more information or control measures to be able to rest assured that future negative impact will exist within known and controllable limits.

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Part II
Retailers

Chapter 4
Electronic Reverse Auctions: Emerging from the Shadows?

Rana Tassabehji

Abstract This chapter examines the role of business-to-business electronic reverse auctions (eRAs), one tool in the armoury of e-purchasing used by businesses including retailers. It tracks the development of this particular technology through the hype cycle and presents some propositions to maximise the use of eRAs as an effective e-purchasing tool. It also explains the damaging effect of the early negative perceptions and underlines the difficulty in overcoming them.

4.1 E-purchasing: An Overview

Drawing on de Boer et al. (2002) definition of e-procurement as the "*use of Internet technology in the purchasing process*", Knudsen (2003) categorised the suite of e-procurement tools as including:

- *E-sourcing*: identifying new suppliers.
- *E-tendering*: sending requests for information and prices to suppliers and receiving responses.
- *E-informing*: gathering and distributing purchasing information to and from internal and external partners.
- *Electronic reverse auctions*: transactions between buyers and sellers for goods and services with the lowest price or other conditions.
- *Web-based ERP and e-MRO*: creating and approving purchasing requisitions, placing orders and receiving goods and services. The former being product related and the latter being indirect items.

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- *E-collaboration*: the correct and updated data regarding product versions, sales forecasts, etc. using collaborative tools to reduce errors and increase information dissemination.

The complexities of trying to assess the direct and indirect impact of e-procurement on organisational costs and bottom line profits, where each tool has a different impact on purchasing costs and other aspects such as strategy, internal and external communications, were highlighted early on (de Boer et al. 2002). Attempts have been made to gain an understanding of the impact of the different e-procurement tools on an organisation's strategic objectives by using the concept of economic rents (Knudsen 2003). Findings showed that e-procurement tools are fully aligned with a competitive strategy, moderately aligned with a resource-based perspective (Ricardian) and only briefly aligned with an entrepreneurial and innovation approach (Knudsen 2003). In another study, three major factors for selecting the most appropriate Internet tool for the procurement process were identified as: motivation of the organisation (reduce procurement costs; increase process efficiency; increase process effectiveness); object of the transaction (relevance and criticality) and the nature of the relationship (market or vertical alliance) (Bartezzaghi and Ronchi 2003). Each of the Internet tools were found to create an effect within the procurement process, which should be aligned with the organisation's strategy. For example, e-auctions for increasing competitiveness that is not critical and develops arms length relationships; e-catalogues for improving efficiencies but with low criticality; and e-collaboration portals for supporting efficiency and effectiveness for relevant components and reliable suppliers.

In a Delphi study of future supply chain management strategies, Ogden et al. (2005) found that sophisticated e-procurement systems will be used to eliminate transactions and reduce transaction costs, where the focus of the technology will be on facilitating information sharing and promoting collaboration and integration between supply chain partners. E-procurement as a complete system scored high whereas individual technologies such as e-auctions, EDI and the like scored relatively low on the impact to organisations in the future, underlining the fact that these are not seen as individual standalone tools but rather as one in a suite of e-procurement tools.

E-procurement tools cannot be considered to be purely technology solutions, but rather a business process change where they are implemented as part of a holistic purchasing strategy at an organisation-wide level (Vowler 2004). If e-procurement tools are harnessed effectively, they can be used to implement the appropriate procurement strategy for a firm. As the use and adoption of e-procurement tools over the years, including eRAs, have been implemented throughout the supply chain, some studies have found that there is not always a direct impact on improved performance (Yao and Zhu 2012; Giunipero et al. 2012). Initial findings have shown that downstream and upstream use of "electronic linkages" (including eRAs), tend to have asymmetric effects, but that investing in e-procurement technology tend to have indirect benefits (Yao and Zhu 2012). Specifically, upstream

integration through e-procurement with suppliers was found to help reduce bull-whip effects. Although this study examined e-procurement tools generally, the findings suggest that eRAs, as one of a group of e-procurement tools, have an impact on the whole supply chain, but more research is needed to explore in detail what that impact is. The "human-interface" and the respective absorptive capacity of the purchasing function was found to be critical in the process of maximising the improvement potential of e-purchasing tools (Kauppi et al. 2013) and these issues will be examined later in the chapter.

4.1.1 The Impact of E-procurement in Organisations

E-procurement is the means by which supply side activities can be integrated together to support greater management of total acquisition costs, with the ultimate aim of providing integration across the total supply chain. In a survey, Croom (2005) reported that although a large number of organisations taking part in the study were involved in e-procurement, less than half believed it had a strategic function. Similarly, Cagno et al. (2004) were not able to evaluate the effectiveness of e-purchasing in the Italian engineering sector, because e-procurement technology still needed to mature before organisations could learn from their experiences and be able to capitalise on the opportunities the technology avails (Hur et al. 2006).

However, the early perceptions that have developed around e-procurement technologies are harmful to the broader adoption of the e-procurement technologies in the longer term, as these attitudes become entrenched within an organisation and become almost impossible to change (Standing et al. 2013). This phenomenon will be discussed in more detail in the following sections.

4.2 Electronic Reverse Auctions

Electronic reverse auctions (eRAs) were first introduced in the 1990s as a means of facilitating the purchasing process between buyers and suppliers (sellers) utilising Internet technology. Since then, their adoption and use has increased in both the public and private business-to-business sectors. In economics terminology they are a monopsony, where there is one buyer and many suppliers (sellers), similar to traditional auctions except that one buyer sends out a request for quotation (RFQ) to a number of invited suppliers. These selected suppliers then participate in an online auction, where a contract's price is driven down by competing sellers. A contract is awarded to the winning supplier at the end of the eRA which takes between 40 and 90 minutes real-time duration.

As the body of eRA related research and knowledge has been growing over the past decade, there appears to be a shift in the findings of these studies. Much of the early research focused largely on the negative repercussions of eRAs and how

companies (mainly large retailers and manufacturers) were using them as a means of providing quick and measurable benefits at low cost (Cagliano et al. 2005). In a study by Hur et al. (2006) they suggested that despite the decline in cost savings of e-auctions over time, managers were beginning to use them as a viable tool for standardising and improving the efficiency of the sourcing process. They posit that the implementation of e-auctions is a learning process for organisational buyers and present evidence suggesting that organisations have learned from their experiences and adapted e-auctions as a useful tool in a strategic procurement toolkit, which enables efficiency and standardisation (Hannon 2003). This trend is consistent with more recent studies investigating the motivations, influences, attitudes and even micro-dynamics and strategies for conducting eRAs (Tassabehji 2010).

The following literature review will be presented in two roughly chronological phases characterised by Garnter's Hype Cycle definitions: the early days, or "phase of disillusionment" (up to 2006), and the maturing stage, or "slope of enlightenment" phase (2007 to date).

4.2.1 Electronic Reverse Auctions: The Early Debate

The early debate surrounding eRAs can be seen to fall into two major camps: those that support e-auctions as a means of introducing process and cost efficiencies in procurement and the dissenters that consider the eRA to be a tool that is being used to destroy long-term relationships, overturning proven supply chain management best practice.

4.2.1.1 Supporters

Economic theory suggested that eRAs have the potential to improve value for money, allocate resources more efficiently and provide transparency in terms of how contracts are awarded (Soudry 2004). Empirical studies and reports from industry users confirmed that some organisations have achieved gross savings of between 10 and 40 % either directly through product price reduction or transaction costs (Hartley et al. 2004; Tassabehji et al. 2006). In one case 40 % of local government savings were shown to come from better prices, with 60 % being realised by freeing staff for more productive roles (Vowler 2004). Not only this, but benefits also included process efficiencies, shorter order-cycle times, broadening the supplier base to capitalise on global markets, and accessing potentially unique supplier capabilities (Hannon 2003; Anonymous 2004; Hartley et al. 2004; Soudry 2004).

In a review of eRAs from an economics and negotiation theory perspective, Carter et al. (2004) found a positive relationship between the number of sellers that participated in an e-auction and e-auction success. Other benefits were found to be,

increased buyer productivity and decreased buyer and supplier cycle times for repeat auctions. They also found a positive relationship between the degree of competition among suppliers and success of eRAs, however in order to achieve this success, buyers had accurately gauged the kind of competition generated within their invited supply base.

Other reported benefits for sellers included a transparency and fairness that eliminated "cronyism and supplier wining and dining" (Hannon 2003); an opportunity for suppliers to react to competitors' prices immediately; transparency of competitors' prices; a level playing field; discovering new price levels; improving levels of quality and service; and motivation to improve competitiveness (Anonymous 2004; Hatton and Young 2004). With more open competitive markets, it was expected that all suppliers would potentially benefit.

Rather than being limited to purchasing commodity goods, e-auctions were also being used for purchasing complex services (Hatton and Young 2004). For instance, Hewlett Packard (HP) used electronic reverse auctions as a negotiation tool where some 20–30 auctions were being conducted in a day for non-tangible services (Prema 2006). Delta Airlines leveraged e-auctions for both direct and indirect spend. In both cases the buyers were expected to prepare their specifications carefully for the more complex items, inviting suppliers to presentations where the specifications and quality of work required was made clear and suppliers were assessed accordingly (Prema 2006).

4.2.1.2 Dissenters

Despite the benefits, reported criticisms of the electronic reverse auction process are considerable.

Emiliani and Stec published widely reporting the negative impact of eRAs such as margin erosion, loss of sales volume, lack of consideration for other factors such as quality, service, and total costs (Emiliani 2000, 2003, 2004; Emiliani and Stec 2001, 2002a, b, 2004, 2005a, b). They highlighted the suppliers' concerns about the pressure they were being placed under and the damage being done to relationships with buyers, where distrust and perceived unfairness fuelled suppliers' beliefs that buyers were abusing their powers. Some of the problems identified were, suspicions of unscrupulous buyer practice to manipulate prices further downwards during the auction through "phantom bidding" (Kwak 2002); the introduction of unqualified suppliers (Kisiel 2002; Hannon 2003); and even seller collusion (Hannon 2003). Although such supplier perceptions of buyer behaviour were unsubstantiated, they persisted and seemed to increase after participation in e-auctions (Jap 2003; Tassabehji et al. 2006). This resulted in the suppliers' reluctance to share cost savings and innovations with buyers and a reduced willingness to help the buyer in any potential future crises (Emiliani and Stec 2001; Presutti 2003; Tassabehji et al. 2006). Other reported supplier worries were the fear of being driven out of business because of prices being too low (Hannon 2003; Tassabehji et al. 2006).

From the buyer's perspective, some argued that eRAs deskilled the role of purchasing to leverage scarce resources, ultimately excluding it from the final decision-making process, which was considered to be very damaging (Hatton and Young 2004). There were reports that sellers/suppliers were getting expert at exploiting low bidding to get the business, and then cashing in through extortionate charges for changes that needed to be made (Hatton and Young 2004).

Emiliani and Stec (2002a, 2004, 2005b) argued that previous studies showing the benefits of eRAs had been greatly overstated by market makers and buyers. ERAs were considered to be a destructive "power based bargaining tool", where measures such as voluntary codes of conduct would have no impact on buyer regulation, increasing trust, or expanding the use of eRAs (Emiliani 2005a).

Having presented the arguments above, the major criticisms of eRAs can be summarised as follows: (a) they are adversarial and contrary to relationship building criteria advocated by supply chain management best practice; (b) they are a power based bargaining tool; (c) they are deskilling the role of buyers. Each of these issues will be discussed and recommendations on how to address them will be made.

4.3 Maturation of ERAs: The Current State of Play

The use of eRAs by organisations has increased and spread across many sectors over the last decade. eRAs have now gained a major foothold in large purchasing departments, becoming a standard tool for e-procurement (Yeniyurt et al. 2011) and accounting for a large percentage of purchasing spend. Their use by buying organisations has extended beyond purchasing purely commodity based products, to increasingly complex products and services including transport, software and professional services (Tunca et al. 2013).

Ariba Inc., a major provider of eRA platforms, have estimated that around 40 % of the eRA market is used for services including legal (Lee 2011). Fortune 500 companies Glaxo, Sun Microsystems Toyota and eBay confirm their use of eRAs for legal services (in particular high-volume work such as, tax filings and intellectual-property transactions) and find this a way of more fairly and uniformly evaluating legal firms' cost-effectiveness (Lee 2011). According to an in-house legal council at FMC Technologies Inc., an oil-and-gas-equipment supplier for the energy industry, who have been using eRAs to find legal counsel for more than a decade, "Every lawyer will tell you that every piece of work they do is incredibly important and risky and has to be custom-made, and that's just nonsense …. No matter how legally brilliant you are, there is always an alternative" (Lee 2011).

However, this kind of eRA use is not universal and some corporations, such as Costco, Xerox Corp. and Cisco Systems Inc. do not find this tool to be appropriate for procuring their legal requirements. According to the general council of Costco, "We're looking for our outside counsel to be creative … I'm not so sure being on the spot in a chat room is the ideal format" (Lee 2011).

Although eRA used in the public sector is not new, it has been growing. In the UK, and the US in particular, eRAs have become established procurement mechanisms for reducing public spending, increasing transparency within government purchasing departments and opening government procurement opportunities to SME suppliers (estimated to be about 50 %). eRAs have been used for some time in local UK government councils, where considerable savings have been made ranging from 48 % for telecommunications and 20 % for agency staff in the East Midlands (IEP 2010). In the UK, the Government Procurement Service was introduced by the coalition government in 2011, and claim to have saved £1.2bn in 2012/13 out of a total £11.4bn of public procurement spend (Cabinet Office, 2013). As a consequence, eRAs for procuring marketing and communications services amounting to £237 million p.a., are being introduced to ensure "the best value for taxpayers, balancing quality with price Marketing and communications are no different" (Budden 2013). There has been an inevitable industry storm with critics within the industry using similar negative and emotive language as "controversial" a "race to the bottom", "uncomfortable", "degrading relationships" (Rogers 2013; Budden 2013), consistent with other industry suppliers exposed to eRAs in the early days.

The trend of eRA use in the US is similar to that in the UK. The US Federal government has reportedly saved taxpayers over $150 million over a 4-year period to 2011, with the proportion of savings increasing in the final fiscal year (Wyld 2011). In addition to the direct costs savings, Wyld's (2011) report illustrates how the tasks conducted in the procurement acquisition process for eRA auctions mirror traditional procurement methods, but the average time for conducting each of these tasks were 7.92 hours more for traditional procurement than eRAs.

4.3.1 Lessons Learned: A Decade On

As the use of eRAs has matured and developed, so has the research uncovering the granularity of issues related to their use, the development of attitudes towards eRAs and the impact they have on organisations (both buyers and sellers). Here, we divide the literature into broad themes ranging from the dynamics and strategies of eRA bidding, the impact on supply chains, factors for successful adoption and use of eRAs. Propositions (P) emerging from each stream of research are summarised and will be compiled as factors for improving perceptions of eRAs.

4.3.1.1 Dynamics of Auction Bidding

The complexity of decisions made during eRAs are not yet fully understood and this is one area of research that will continue to grow over time as more eRA data is collected and made available (Yeniyurt et al. 2011). There are emerging studies that examine buyer bidding data from eRAs, both in a laboratory and from live

corporate settings, that contribute some empirically based recommendations for managing eRAs more effectively. Incentives have already been identified as having an impact on supplier/seller engagement with eRAs. This line of research has been enriched further.

Using both technology adoption literature (mainly TAM) and relationship marketing theory, Giunipero et al. (2012) highlighted the importance of support by suppliers selling their goods or services, in the adoption of e-procurement tools and the need for incentives to enhance usage, which will ultimately build co-operation and trust with supportive suppliers. More specifically related to eRAs, in a study of multi-attribute reverse auctions, in a laboratory setting, Ray et al. (2013) found that improved supplier perceptions of eRAs and their continued participation in future auctions as an outlet to sell their goods or services, could be achieved through incentive-oriented mechanisms. In this particular study, the incentive was awarding business at least once in ten auctions to ensure the supplier participated in future auctions. As this was conducted in a laboratory setting, the actual types of incentives need further investigation but the use of incentives is something that could improve buyer–seller relationships in the long term.

P1. Incentives have been proven to have an impact on seller participation

To counter the reported problem of the "winner's curse", where suppliers that have succeeded in obtaining the contract to sell their goods or services and are often left to bear the capacity risk, studies have found that volume flexibility improves e-procurement performance in terms of cost, quality and delivery (Devaraj et al. 2012). Thus buyers, including large retailers, must choose the right contract to improve the performance of procurement auctions (Li and Scheller-Wolf 2011). In situations where buyers, for instance large retailers, source non-commodity goods and face uncertain demand, they may require a supplier to invest in capacity. In this instance, Li and Scheller-Wolf (2011) identify two strategies for eRAs. The first is a push contract, where the buyer, specifies the quantity of the goods before the demand is known. This is most appropriate for mature low-level products with low demand variability and where a large number of suppliers can produce these items at low costs, for instance standard t-shirts or jeans for a clothing retailer. The second is the pull contract where the buyer does not specify the quantity until after the demand is realised and in this instance, there is a need for applying a floor price, otherwise this could be harmful as there is a potential that orders might not be fulfilled. These types of contract are more appropriate for new or high value products where technology is expensive and there are relatively few suppliers and the market is characterised by uncertain demand. An example here might be when a high end luxury clothing retailer that requires specialised skills and tools to create their garments (perhaps a new line) and demand is unknown, the recommendation for the retailer in this instance when using eRAs, is to set a floor price for the contract so that all eRA participating suppliers selling their goods and services can factor this into their calculations.

P2a. Ensure quantities are pre-determined for commodity goods
P2b. Ensure the floor price is set for high value strategic goods

Public sector purchasers, using eRAs were found to be more successful (in terms of reducing costs) when there was more competition among suppliers (Shalev and Asbjornsen 2010). Other factors that improved success of eRAs for public sector procurement professionals were the quality of the specifications. Although simple purchases were found to be more likely to be successful, this was considered to be more of a function of better specifications than the complexity of the product. This is also important for private sector companies. For example, where retailers did not provide detailed specifications of their required products, the suppliers selling those particular goods, were unable to supply those goods both in the instances when they had won the eRA and also when they had been unable to bid for the contract in the eRA context (Tassabehji et al. 2006).

P2c. Improve specifications for eRAs to improve performance of eRAs

Research has also found that when rank (i.e. supplier rank/offer position) and price based visibility was adopted by buyers in eRAs, then there was more intense bidding activity among suppliers and they were more likely to feel satisfied with the process (Yeniyurt et al. 2011). Thus when retailers adopt eRAs to purchase goods and services, they need to ensure that there is information transparency and visibility among the sellers selected to take part in the eRA.

The role of both the buyer and seller supplying the goods or services is also an important factor in the effective use of eRAs. In an international study of the use of e-purchasing tools, Kauppi et al. (2013) found that simply implementing e-purchasing tools does not impact performance, but it is the human interface that maximises information and transactional improvement. Being consistent with other studies, buyer competence (Hawkins et al. 2010), manager competence and communications climate were all found to enhance e-procurement performance. In this instance, for retailers using eRAs as a purchasing tool, there is a need to ensure those who will be directly undertaking the buying process using eRAs are fully trained and experienced, with an open and a transparent communication channel within the retailer's buying team.

P2d. Ensure communication climate and information visibility (for instance supplier rank/offer position and price) to encourage bidding and future participation

From the perspective of the sellers, a supplier's need for cognition means they are more likely to focus and use cognitive effort to evaluate risk, which improves decision-making and consequently performance (Yeniyurt et al. 2011). Experience of eRAs have been found to be a motivating factor for a supplier participating in more eRAs (Hawkins et al. 2010; Yeniyurt et al. 2011), suggesting an escalation of commitment dynamic where suppliers that had bid previously and had lost the eRAs, tended to submit more subsequent bids and participate in other eRAs almost to mitigate their decision to take part (Yeniyurt et al. 2011). Thus for retailers

using eRAs, they need to ensure that the sellers invited to take part in the eRA process, have as positive an experience as possible, to capitalise on their likelihood to take part again in any future eRA.

P3. Human factors are critical in successful e-procurement use
P3a. Buyer competence of eRAs
P3b. Supplier experience of eRAs
P3c. Supplier tendency for cognition

4.3.1.2 Adoption and Perception of eRAs

More recent studies have begun to examine how attitudes and motivations toward eRAs have emerged.

In one of the first studies to look at motivation and attitudes towards eRAs, Tassabehji (2010) found that eRAs are increasingly perceived to be a tool that can be used for strategic procurement and building relationships with suppliers. Buyers' motivations for using eRAs differ according to the types of goods and services being procured. For instance, for leverage and non-critical (commodity) items then these could be considered for eRAs use, but bottleneck items and strategic items with high profit impact and high supply risk, were not considered suitable for e-auctions use. However, Tassabehji (2010) suggests that this is not a static situation, but rather a dynamic situation where items can move around the purchasing portfolio depending on the supply status. Although attitudes to eRAs are largely negative, this was found to be related to senior management's perceptions that eRAs do not seem to be making a contribution to strategic integration and collaboration. But this was considered to be a short to medium term situation with an optimistic expectation that longer term, this attitude will change as eRAs mature and their adoption and use also changes. Thus, for retailers using eRAs as a tool for buying goods and services, their perception of the use of eRAs seem to be related to the type of goods or services they buy using eRAs. By ensuring that retailers use eRAs for the appropriate goods or services, using the optimum processes and procedures (outlined in this chapter), their perceptions of eRAs will improve and they will be able to capitalise on the benefits that eRAs have to offer while minimising the drawbacks.

P4. Improve perceptions of eRA tools as a strategic as well as administrative tool
P4a. Ensure eRAs are used for the appropriate circumstances

TAM components of usefulness and ease of use (Davis 1989), were found to impact adoption of e-procurement technology but Giunipero et al. (2012) also suggest that collaboration with suppliers in the development of e-purchasing systems, will create a vested interest for both parties of buyers and sellers. This then will improve organisations' internal perceptions of e-purchasing tools through the obvious measures of shorter cycle times and more efficient administration—which magnified through the supply chain—leads to improved responses to marketplaces and external customers.

P4b. Demonstrating usefulness and ease of use (TAM components)
P4c. Engage suppliers in the development of e-purchasing systems

The implications for retailers are, that if the eRA technology is easy to use and useful to them, they are more likely to adopt the eRA. Thus eRA platform providers and eRA technology vendors must ensure that eRAs are easy to use and useful for both sellers and buyers. Furthermore, for retailers to ensure that their suppliers adopt eRAs as a tool for buying the goods and services they sell, retailers need to engage their suppliers in the development of the eRAs both from a technical and process perspective.

The issue of ethics is highlighted as one that has to be dealt with to nullify the negative ethical perceptions of eRAs that have emerged from lobbying, rumour, technical problems and public discourse. Charki et al. (2011) stress the need for moving from an understanding of ethics that is interpreted as honesty, to one that incorporates values of fairness shared by many of the actors. Thus for retailers that are largely consumer facing, there is an increasing onus and pressure from a range of stakeholders that they abide by a strict code of ethics and corporate governance in all their business dealings. Consequently the use of eRAs by retailers needs to come with clear, transparent and ethical guidelines. This will encourage suppliers to see eRAs as a fair and ethical way of selling their goods and services online to buyers/retailers.

P4d. Move ethical perceptions from honesty to one of fairness shared by all actors

4.3.1.3 Culture of IT Innovation

Although economic factors are likely to be the major drivers for adopting of eRAs for some buyers, other factors such as cultural, social and political also play a role in increasing realisation of benefits and extending activity in the global marketplace (Standing et al. 2010). A culture of IT adoption and innovation within the organisation is critical to the successful adoption of eRAs. Availability of IT infrastructure and the prior use of IT are among the most robust predictors of new IT use in organizations (Zhu and Kraemer 2005). Mishra and Agarwal (2010) demonstrate a "virtuous" cycle of IT innovation in firms that become progressively more sophisticated in their use and application of IT where the "next" related innovation becomes easier to use. Suppliers that leverage technological resources and their prior experience with IT, demonstrate a link to procurement process performance. Thus for retailers buying and suppliers selling, they are more likely to be adopting and using eRAs if they already have, within their respective organisations, a culture of IT adoption and innovation. In this case, eRAs are both a new technology and an innovation in the purchasing process.

P4d. Culture of virtuous cycle of IT adoption and innovation—availability of IT infrastructure and prior use of IT

4.4 Understanding the Damaging Effect of the Early Dissenters

The study by Charki et al. (2011) shows how rumour plays a key role in crystallising and legitimating negative interpretations of technology—which are equivocal. They also highlight how important it is for early technology adopters to negate ethical dilemmas because once the technology has been judged to be unethical, individual corrective actions are ineffective to counter these negative representations and local incidents attempting to develop a strategy to address the technology's fairness is of no avail to shift industry-wide perceptions.

A specific case in point is a longitudinal (10 year) study of eRA adoption in the French retail sector (Peng and Calvi 2012). Buyer resistance to adoption and use of eRAs were found to be fuelled by negative perceptions of the eRAs arising from "misuse" resulting from a lack of understanding how best to utilise eRAs, coupled with early teething problems with the eRA technology and processes. An element of role self-preservation was also found to impact resistance to adopt eRAs. Buyers were fearful that the use of eRAs would diminish the perception of their negotiation skills, which would also mean that certain buyers could no longer favour certain suppliers for their own self-interest. In addition, with a lack of an appropriate incentive system, buyers were concerned that they could not maintain the prices they achieved through eRAs in the long term, increasing their workload, which would not be acknowledged by their organisation. Finally, and only currently relevant in France, there was an additional perceived problem with the "Loi Dutreil" (European Commission 2006) in France where eRAs were regulated under law. This added further negative dimensions to the perception that eRAs were somehow unethical and needed regulation (Charki et al. 2011; Peng and Calvi 2012). This also meant that participants were further burdened with bureaucracy to ensure that they were acting according to the law (Peng and Calvi 2012). In a Greek context, a legal framework was found to have the lowest impact on post adoption level of use of e-marketplaces by supplier organisations (Saprikis and Vlachopoulou 2012).

In a study of adoption of electronic reverse auctions (eRAs) in Australia, Standing et al. (2013) found that the narrow use of eRAs (mainly for commodity purchase) is shaped by the fear and disdain surrounding past use and the perception of the damage to supplier relationships. They highlighted the importance of organising vision, which is the process of interpreting, legitimising and mobilising organisational opportunities for exploiting technology. This acts as a real and perceived force that influences the adoption of eRAs. In this case, the adoption of eRA was not seen as a major investment, but rather as a short-medium term tactical instrument. This vision is very hard to change and ultimately determines the technology's organisational contribution, the scope of its use and its strategic significance. In this case, the authors are pessimistic that the organisational vision of eRAs and the risk aversion mentality is a barrier to the widespread adoption and use of eRA on a strategic scale within organisations. The bad publicity and

perceived damage to supplier relationships within the wider community/market in Australia is too strong a force to resist and mind set to over turn, all things being the same.

P5a. Negative perceptions developed in the early days based on technical problems, early misuse and lack of understanding how best to utilise eRAs

P5b. Negative perceptions also can result from regulation of eRAs

4.5 Summary and Conclusions

This chapter has presented the issues that surround eRAs and explained how attitudes and perceptions can and do impact the reputation and thus adoption and use of eRAs. The findings from the literature have tracked eRAs through the hype cycle trajectory, which Gartner refers to as the "peak of inflated expectations", where eRAs are now emerging from the excessive criticism experienced in the "trough of disillusionment" phase, to the next stages of "slope of acceptance of reality" and eventually the "plateau of productivity" where organisations will have learnt to use eRAs effectively and efficiently. Based on empirical studies, this chapter suggests ways in which eRAs can be developed to address some of the real problems that have been encountered by those that have adopted and used eRAs.

More and more buyers are using eRAs to purchase goods and services that are increasingly complex and strategic. This global trend is likely to continue upwards in both the public and private sectors as the transparency, transaction costs and floor prices that eRAs provide continue to be attractive to buyers. However, a negative perception has been built up over the years and in some instances has become intractable, or at the very least left suppliers wary of this tool. By conducting an analytical review of the literature we have been able to review how eRAs can be improved to address these negative perceptions. These are summarised in Table 4.1.

From this, it can be seen that the role of the purchasing manager is critical to the effective management and use of eRAs. This role is becoming more complex as stakeholder pressures require, on the one hand, costs to be cut to their absolute minimum, while on the other efficiencies to be maximised through closer collaboration, information sharing and systems integration. Both buyers and suppliers involved in the procurement process need to ensure they have a good understanding of the mechanics of eRAs and their costings. Purchasing professionals need to be experienced in the use of eRAs in order to negotiate effectively within the pressured environment of online auctions. From here and only once these negative perceptions have been overcome, can eRAs emerge into "the plateau of productivity" and be used to their full potential as one in an array of e-procurement tools that will benefit all participants.

Table 4.1 Solutions for improving perception of ERAs

Problems of eRAs	Solutions for improving eRA perceptions
Destructive tool	
For commodities not complex items	Prepare detailed specifications (P2c) where quality is made clear and give presentations to suppliers to enable them to ask questions and seek clarification
Destructive power based bargaining tool	Use eRAs as one in a suite of tools for efficiency and standardisation of sourcing (P4a)
Adversarial and contrary to relationship building	
Unscrupulous practice: phantom bidding and unqualified suppliers	Incentivise bidders (P1)
	Pre-determination of ethical appropriateness in negotiation process by buyers which focuses fairness for all (P4c)
Supplier charges for changes in contracts or terms	Pre-determine quantities (P2a)
	Set a floor price (P2b)
Reluctance of suppliers to participate	Incentivise bidders (P1)
	Knowledge repository for suppliers to draw on past eRA experiences (P2d)
	Pre-determination of ethical appropriateness in negotiation process by buyers (P4c)
Negative impact on suppliers	
Winner's curse	Pre-determine quantities (P2a)
	Set a floor price (P2b)
	Experience of suppliers and buyers (P3; P3a; P3b; P3c)
Pressure on suppliers	Need experienced suppliers (P3b; P3c)
	Incentivise bidders to create build good will (P1)
Creating distrust among suppliers	Payment to bidders will alleviate mistrust (P1)
	Knowledge repository for suppliers to draw on post eRA experiences (P2d)
	Pre-determination of ethical appropriateness in negotiation process by buyers which focuses fairness for all (P4c)
Deskilling the role of purchasing	
Deskilling purchasing	Purchasing skills must be improved and developed for eRA use (P3; P3a; P3b; P3c)
	Evaluation of appropriate e-procurement tools aligned with organisational and purchasing strategies (P4; P4a)

Finally Table 4.2 identifying the opportunities and threats from the adoption of e-commerce in general and eRAs in particular from the perspective of retailers are presented below.

Table 4.2 Summary of identified opportunities and threats deriving from e-commerce and ERAs

Opportunities for retailers	Threats for retailers
Reductions in price (5–40 %) of goods purchased from suppliers (sellers)	Sellers tend to overbid—the "winner's curse" where sellers have to deliver at losses or are unable to deliver to the buyer
Reductions in process administration costs for buying goods or services	Danger of alienating suppliers and other sellers who are not successful bidders
Reduction in purchasing time (25–50 %) and reduction of buying cycles	Gross savings could end up as net losses through lack of understanding expenses involved in online buying
Increased contact with new suppliers and access to a wide range of sellers around the globe	Danger of over-looking other qualities of goods and services and being concerned only with price
Higher price visibility of goods and services being sold by various suppliers	Disruption of current relationships with incumbent suppliers
Retain suppliers at lower prices where each contract for goods or services are opened to a range of new and existing sellers	Loss of loyalty from regular suppliers and potential disruption in supply chain
New opportunities for smaller retailing companies to benefit from lower prices from sellers and improved buying process efficiencies with minimal capital investment	Accusations of being unethical and unfair which could potentially ruin their reputation

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Chapter 5
The Internet as a Small Business E-commerce Ecosystem

Michael Buxton and Nigel Walton

Abstract The purpose of this chapter is to analyse how the ecosystem concept can be applied to small businesses and how the Internet and e-commerce can help SMEs harness the required resources to enhance their competitive performance in the marketplace. The chapter will investigate the wide variety of e-commerce applications that are available to small businesses to help address the issue of limited resources. It will provide an ecosystem map illustrating how each functional area of a small business can utilise Internet e-commerce applications to enhance their resource base. The chapter also explores the opportunities and threats that the e-commerce ecosystem model poses for small, medium-sized enterprises (SMEs). This is based upon empirical research consisting of three focus group interviews undertaken with small and medium-sized retail service firms located in the Herefordshire and Worcestershire regions of the United Kingdom in January–February 2014.

Keywords Ecosystem · Internet · Resources · E-commerce · Applications

5.1 Business Webs and Ecosystems

During the 1990s, globalisation and the introduction of new technologies such as the Internet created new opportunities for businesses to increase their competitiveness by reducing costs and increasing productivity through specialisation within their operations. This was achieved through outsourcing previous 'in-house' processes to other firms which therefore allowed businesses to specialise in areas where they had a particular competitive advantage (Poon and Jevons 1997;

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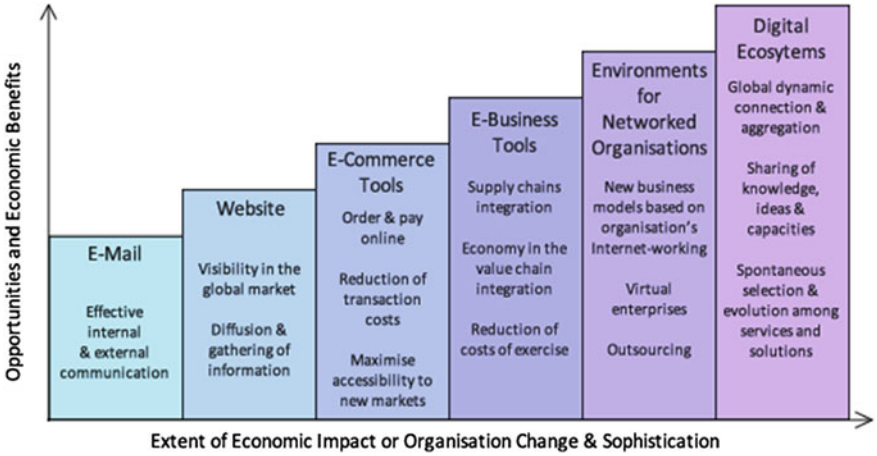

Fig. 5.1 The Cisco ladder of ICT adoption—modified to include digital ecosystems (Dini and Nachira 2007)

Johnson 2006; Fawcett et al. 2008). This movement towards the global supply chain consequently led to the development of networks or webs of interconnected businesses that can be referred to as business ecosystems.

Moore (1993) described a business ecosystem as an environment involving businesses that work cooperatively to support the development of new products, satisfy customer needs and create new innovations. These collaborative relationships between businesses in ecosystems was further supported by Hyeyoung et al. (2010), who defined a business ecosystem as an economic community, where companies who share symbiotic relationships work together in order to gain a competitive advantage.

The rapid and exponential growth of the Internet and e-commerce has resulted in multiple business communities or business ecosystems evolving which provide valuable resource inputs for smaller businesses that can be leveraged to good effect. This digital e-commerce ecosystem of Internet-based applications is illustrated in Dini and Nachira's (2007) framework below (Fig. 5.1).

The chapter will now analyse how the Internet and e-commerce as a digital ecosystem can provide a range of tools and applications to enable small firms and start-up ventures to operate asset-light business models.

5.2 The Internet and the Small Business E-commerce Ecosystem

A common threat to the survival of small businesses is the fact that they have limited resources. However, over the years, innovation and the development of e-commerce technology has given rise to new opportunities and economic benefits

for businesses (as shown in Fig. 5.1). These technologies include e-commerce applications which provide businesses with the resources and opportunities to carry out business functions that would otherwise not be possible if they were performed in-house. In order to overcome the threat of limited resources, it is important for small businesses to consider the different e-commerce applications that are available to them that allow them to enhance or improve the efficiency of their existing resources. As suggested by Dini and Nachira (2007), many SME's are only at the email or website adoption stage of their digital ecosystem model (Fig. 5.1) and they are subsequently unable to spend time investigating or trialling different e-commerce applications. These findings were also endorsed by research recently undertaken with small retail service firms in the Herefordshire and Worcestershire regions. In order to investigate the e-commerce applications that are available to small firms and the potential benefits, it is important to consider the different business functions that may contribute to a small firm's operation. These consist primarily of the finance, marketing, operations and human resource functions. When these have been considered, the chapter will map out a small business ecosystem linking the different business functions to the relevant e-commerce applications that can be utilised to exploit opportunities for performance enhancement (the small business ecosystem map is illustrated in Fig. 5.2).

It is also important to appreciate that using an ecosystem approach when considering the available e-commerce applications helps to understand the interrelationship between resources. Therefore an ecosystem approach is appropriate because it permits examination of all the available resources that contribute to the overall success of the business therefore providing a holistic view. The chapter will now go on to consider some of the business functions shown in Fig. 5.2 and explore the different e-commerce applications that relate to them, starting with the finance function.

5.3 Finance

In order to examine the relevant e-commerce applications relating to this important area of small business resources; finance can be split into three separate business functions: raising capital, card payment processing and financial accounts.

5.3.1 Raising Capital

Small businesses often find it necessary to raise capital, whether it is for the financing of a new business or for the development or expansion of an existing one. According to the Bank of England (2000) and before the financial crash of 2008, the most common method of finance for small businesses was the use of retained profits from previous trading activities. However, this is not possible for

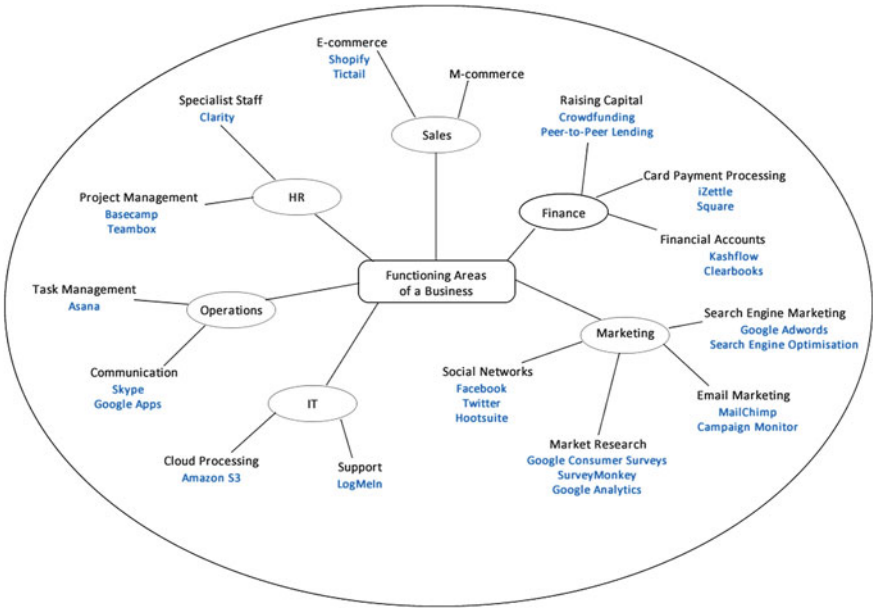

Fig. 5.2 An example of a small business e-commerce ecosystem

business start-ups or non-profitable firms. Therefore an important source of finance for small businesses comes from the entrepreneurs and owner-managers themselves, friends and family and external sources such as bank loans. However, some small businesses have been finding this difficult because not only has there been a reluctance to lend to high risk ventures (Cressy and Toivanen 2001), there has also been a general withdrawal of funding support following the credit crunch as high street banks chose to restructure their balance sheets instead of granting support to SMEs. Consequently, many small businesses are looking towards other sources of finance such as crowdfunding or peer-to-peer lending services to raise capital.

Crowdfunding, as explained by Ordanini (2009), is an initiative undertaken usually via the Internet in order to raise money for new projects by collecting investments from many different people i.e. the 'crowd'. Crowdfunding has become an effective method of raising money and has been used for many different projects including the funding of new bands, fashion designers, software applications, bars and non-profit organisations. Small businesses can therefore use crowdfunding as a way to raise capital through one of the many crowdfunding websites such as Kickstarter, Fundable or Indiegogo. It is however, important to note that certain websites have different rules about what type of project can be funded through their website. For example, Kickstarter can only be used for projects that relate to: art, comics, dance, design, fashion, film, food, games, music, photography, publishing, technology and theatre (Kickstarter 2011). Another important aspect of crowdfunding is that not all websites allow project owners to offer equity to the backers of

the projects. Instead, many offer a rewards system whereby people who pledge money receive different rewards depending upon how much they pledge. These rewards can include exclusive news and updates about the project, as well as early product releases. Crowdfunding is therefore not only a useful method of raising capital for small businesses without having to give away equity but it also provides the opportunity for businesses to engage with consumers and acquire useful feedback on early product releases before the product or service is launched to the general public (Belleflamme et al. 2011).

In addition to crowdfunding, a similar method that small businesses can use in order to raise capital is to apply for a loan through a peer-to-peer lending website. Peer-to-peer lending is similar to crowdfunding in that the loans come from people or "peers" as opposed to a bank. However, unlike crowdfunding, since it is a loan, peer-to-peer lending requires the borrowers to repay any loans with interest, just as a bank loan would. Nevertheless, this type of loan can be more beneficial because as Bartram (2011) reported, peer-to-peer lending has enabled many businesses to gain access to loans at much more favourable interest rates than banks were prepared to offer and as a result it has become a common method of obtaining a loan for businesses.

As described above, both crowdfunding and peer-to-peer lending services provide small businesses with new opportunities to raise capital through the Internet therefore enabling them to improve their financial resources and their survival prospects. There are, nevertheless a number of threats relating to this recent e-commerce innovation (Table 5.1). If the business is a start-up venture then the business idea is made widely available to a global audience who are in a position to copy the concept. This forces small enterprises to seek intellectual property protection which increases start-up costs even further and subsequently the level of risk involved. This new source of finance is also unregulated so there are threats relating to the reliability of funding sources thereby necessitating due diligence. This also entails further time and resource expenditure. A further threat is the failure to raise the necessary funds online resulting in damage to the firm's reputation and negative rather than positive word-of-mouth. These were also concerns expressed by the SMEs who participated in the focus group interviews although some of the businesses had received finance via Funding Circle.

5.3.1.1 Card Payment Processing

Another business function where the e-commerce applications offer new opportunities for small businesses is in the ability to accept credit and debit card payments via mobile devices. As reported by Howard (2013), there are several companies that are offering services that enable small businesses to accept card payments through the Internet by using an app and a card reader that connects to a smart phone or tablet. In order to be able use this technology, small businesses only require a card reader device, which is provided by the company and a smart phone or tablet with an Internet connection to run the free app.

This technology offers many opportunities for small businesses because firstly, by enabling the acceptance of card payments over the Internet, it allows businesses that are mobile, such as taxi drivers, plumbers or pop-up shops, a simple way to accept credit or debit cards. This also reduces the threat of lost sales as more people move away from cash payments or don't have the necessary funds at the opportune moment. Secondly, some of the app's provide businesses with the ability to track sales, customer trends and inventory (Leonard 2012). This consequently, provides businesses with useful information that can help to enhance their performance through tracking popular products as well as forecasting staffing levels and materials requirements at certain times of the year based on historic data.

A further advantage of mobile payment processing is that whilst there is normally a one-off fee for the card reader, there are no monthly fees, only a percentage fee for each transaction, which the standard rate is currently 2.75 % (Lunden 2013). This as a result, is a relatively small cost compared to that of traditional card readers which, as The Economist (2012) explains, can be expensive and have fixed monthly fees on top.

Moreover, the ability for small businesses to take immediate mobile card payments can also help to improve cash flow (Table 5.1). This is because, as stated by the Federation of Small Businesses (2011), 73 % of small businesses were affected by late payments in the previous 12 months. Furthermore, the Federation of Small Businesses (2011) also found that 53 % of small businesses spent between 1 and 6 hours each week chasing payments. These issues affect the resources available to small businesses in terms of finance, time and labour. However, by using this technology these issues can be avoided, as it allows payment to be taken at the time of the sale or delivery. One of the threats of providing an e-commerce payments capability is that new technologies such as the electronic wallet—using near-field communications (NFC) and smart phones—and other payment platforms have the potential to disrupt this payment method resulting in unnecessary expenditure on a technology that has a very low take-up or where different types of hardware and software are required. Therefore, until a common e-commerce platform is established the return on investment for SMEs may be limited. The absence of network effects (i.e. the fact that many customers weren't interested in using this payment method) was one of the key reasons given by the focus group participants for the non-adoption of this e-commerce technology.

Financial Accounts

An additional finance-related business function that can benefit from the use of e-commerce applications is financial accounts. This is where small businesses are able to manage their financial accounts via cloud based applications such as Kashflow or Clear Books.

Cloud based accountancy software provides a variety of opportunities that can be useful for many small businesses. These include the ability to access their accounting data anywhere, at anytime and on any platform, as long as there is an

Internet connection. This can be very useful for mobile businesses as well as owner-managers who want to look at the business' finances during out of work hours. In addition to this, the financial data can be used to generate key performance reports and graphs which can help small businesses understand current performance quickly and effectively (Clearbooks 2011a; Kashflow 2012a).

Furthermore, the software can be used to set up automatic tasks such as recurring invoices and late payment reminders (Clearbooks 2011b; Kashflow 2012b). This can be used to help save time and improve cash flow, consequently avoiding the issues relating to late payments previously discussed.

Another opportunity created by an e-commerce cloud based application is that small businesses can provide their accountants with access to the accounts (Clearbooks 2011b). This can help to reduce the inconvenience of sharing the financial information with the accountant as it is readily available online. This should help to save time for the accountant and thereby lower the accountancy costs for the business.

These types of system have a further advantage in that they are available at a low monthly rate rather than a large one off cost. This reduces the burden on the financial resources of the business. Furthermore, with a monthly fee, as opposed to a one off payment, businesses will benefit from free future updates (Clearbooks 2011c; Kashflow 2012c).

Moreover, another benefit of this technology is that companies such as Kashflow allow integration with other cloud-based applications such as MailChimp. According to O'Hear (2011), this can benefit small businesses greatly by providing them with detailed information about their customers which they can then use to create targeted email marketing campaigns based on characteristics such as customer spending habits, just as larger businesses are able to do. However, there are a number of e-commerce threats relating to such systems including security concerns (Table 5.1). Many owner-managers wish to retain a high level of personal ownership over their financial information. In addition, there has to be some form of financial system in place before any data can be uploaded and this requires resources such as time, specialist administration skills and therefore money. Owner-managers therefore view such developments as an additional cost or overhead rather than an investment in labour-saving technology and enhanced efficiencies. Many of the small firms that were interviewed did not even have manual record systems in place although the medium-sized enterprises were using Sage online software (Sage One) and expressed interest in alternative e-commerce software solutions.

5.4 Marketing

As noted by Fuller (1994), marketing can be a problematic business function for many small businesses due to the lack of experts and specialists which are otherwise available to larger businesses. Furthermore, Stokes and Wilson (2010)

indicated that other resource limitations, including the non-availability of finance, could also contribute to the inability of small businesses to undertake effective marketing practices. This section of the chapter will therefore examine how social networks, email marketing and search engine marketing can be used by small businesses and how e-commerce applications can enhance the marketing resources and capabilities of these firms. In addition, this study will also examine how e-commerce applications can enable small businesses to carry out market research and how they can be used to facilitate open innovation practices such as crowdsourcing.

5.4.1 Social Networks

In recent years, social networks have become a significant part of a consumer's lifestyle and according to McGiboney (2009) they account for 17 % of total time spent on the Internet. As a result, this provides small businesses with the opportunity to utilise social networks as an effective marketing medium to engage consumers, acquire customer feedback and increase brand awareness.

One of the ways social networks can be used to engage consumers is through their advertising services such as Facebook Ads. As Bolotaeva and Cata (2011) explain, this can be a relatively inexpensive method of advertising compared to traditional approaches because, similar to other advertising platforms, businesses only have to pay if the Ads achieve results i.e. when the Ad is clicked upon. Furthermore, businesses can set a daily budget, which allows firms to control advertising expenditure (Facebook 2010). In addition to this, Facebook enables businesses to target specific consumers based upon information they provide on their Facebook accounts including location, age, birthday, interests, education and connections (Facebook 2010). This means that small businesses can focus their resources on marketing to consumers who are more likely to make a purchase therefore allowing them to make the most of their available resources.

An alternative method of marketing using social networks is to set-up profiles for the business on different social networking websites. These can then be used to acquire 'supporters' or 'followers', which will be notified as the business posts news, updates and other messages on its social networking profiles. This can be a valuable method of promoting the business as well as its products and services because it can be done with very little effort and no expense other than the short amount of time required setting it up and implementing it. This method of marketing makes it ideal for small businesses with low and/or no marketing budget. In addition to this, a major advantage of social media marketing as opposed to traditional marketing methods (such as radio, newspaper or television advertisements) is that it is very easy for consumers to share messages and content virally amongst their contacts, consequently creating a vast potential audience (Harris and Rae 2009).

Social networks can also be used as an effective method of market research by gaining customer ideas and feedback which can then be used to assist business and product development. There is no cost involved other than the time required setting it up and implementing it. For example, a small bakery could ask its customers to vote for their preferred flavour for a featured cake. By doing this the bakery will not only know which cake is more popular and have an estimate for the number of potential sales but it could also help customers to feel more valued as their opinions are being sought after, which may lead to increased customer retention.

The interaction between businesses and consumers over social networks has become important because as Diffley et al. (2011) suggest, consumers are no longer satisfied with just being an audience for a business' marketing messages but want to have an active role in improving their products and services. They also implied that consumers have become empowered consumers or 'prosumers' who are highly knowledgeable about products and services. Businesses can therefore use social networks, unlike other methods of marketing, to engage with 'prosumers' to share messages and opinions as well as encourage feedback and new ideas that can be used to improve the products and services of a business. Moreover, as indicated by Diffley et al. (2011), since consumers have trust in each other, the shared content and electronic word-of-mouth communications regarding products and services over social networks are considered to be far more trustworthy than marketing campaigns created by businesses themselves.

Social networks such as Twitter can also be used to promote the business whilst providing effective customer service. This can be achieved by answering users questions and commenting when users mention the business or its products and services. As Bernard et al. (2009) suggest, micro-blogging applications such as Twitter provide interaction and allow more personal communication to take place between the users due to the maximum character length. This is important because as Kozinets (1999) notes, this type of conversational engagement between businesses and consumers has become increasingly popular (as consumers appreciate the personal messages) therefore improving the relationship between the business and the customer. In addition to this, the customer's contacts will also see the messages, which subsequently help to promote the business and improve brand awareness.

In order to manage their social media marketing, small businesses can use e-commerce applications such as HootSuite. HootSuite is a social media management tool that enables businesses to manage multiple social network accounts from one application (HootSuite 2013a). In addition to this, as described by Peters (2011), HootSuite also provides a number of useful features that can assist with social media marketing including the ability to schedule posts and the provision of analytics that measure user activity on social networks. A further feature of HootSuite is that it enables businesses to setup custom searches to monitor social networks when users mention the business or brand (HootSuite 2013b). This can be helpful to businesses wanting to provide customer service over social networks as discussed above. Moreover, due to the potentially limited financial resources

available to small businesses, it is important to mention that HootSuite also offers scalable plans including a free plan depending upon the level of features desired. This is beneficial because whilst the free plan does not include all of the advanced features of the paid plans, small businesses can utilise the free plan until the required financial resources are available or the return on social marketing becomes significant enough for them to upgrade to the more advanced paid plans (HootSuite 2013a).

5.4.1.1 Email Marketing

As stated by Gopal et al. (2006), email marketing has become an important part of advertising for many businesses due to the ability to tailor messages to target specific consumer segments and it is very low cost in comparison to other methods of advertising. This is important because small businesses do not have the financial resources to spend large amounts of money on advertising campaigns. In addition to this, as noted by Reed (2010), email marketing can also be used by small businesses as an effective way to achieve marketing objectives such as building relationships with existing customers, encouraging repeat business and acquiring new customers.

In order to carry out effective email marketing there are several e-commerce applications that small businesses can use to assist them which can help to improve both their marketing resources and performance. According to Reed (2010), Internet applications such as MailChimp and Campaign Monitor provide small businesses with a variety of features that can help to manage and optimise their email marketing campaigns. In addition to this, Reed (2010) explains how the use of these applications requires very little technical knowledge, which is useful because as previously mentioned, many small businesses may not have specialist skills or the expert knowledge available to them.

Both MailChimp and Campaign Monitor offer a variety of features that can be beneficial to small businesses including the ability to design and create emails using their pre-designed templates and a simple-to-use in-built design editor (MailChimp 2012a; Campaign Monitor 2013a). This can be helpful for small businesses that do not have the required skills to create professionally designed emails because instead of having to pay a designer to create them, they can use the in-built design editor. Another useful feature of these applications is that they enable small businesses to produce a mailing list as well as "Subscribe" and "Unsubscribe" forms that link to the list. This automates the process adding and removing users from the list (MailChimp 2012b; Campaign Monitor 2013b). This is useful because it means that once an email list has been setup, there is no need to manage the list manually, allowing small businesses to spend their limited time on other tasks.

A further important feature that can benefit small businesses is the ability to use either of these applications to track important performance data and information about each of the email campaigns. Amongst other things, this data includes how

many of the emails were opened, who opened them, which links they clicked on and what device the email was viewed upon (MailChimp 2012c; Campaign Monitor 2013c). This can then be used to analyse consumer behaviour so that future email campaigns can be improved. Furthermore, this data will also enable small businesses to segment their email list to target different consumers based on details such as their location or levels of engagement. By segmenting the emailing list in this way businesses can then provide more relevant content to target each segment in future emails, which should help to improve consumer engagement. Furthermore, both MailChimp and Campaign Monitor integrate with tools such as Google Analytics, which allows small businesses to view other performance data such as conversions on their website and return on investment (MailChimp 2012c; Campaign Monitor 2013c). This is important, because small businesses will be able to compare the number of conversions and return on investment to other methods of marketing to ensure they are making the most of their limited resources.

Search Engine Marketing

Another important method of marketing that should be considered for small businesses is to drive potential customers to their website using search engine marketing (SEM). SEM is important because according to Fleishman-Hillard (2012), 89 % of consumers rely upon search engines to help make purchasing decisions. In addition to this, SEM can be used to target consumers that are actively searching for particular products or services and are therefore further along the purchasing process than other forms of marketing. If carried out correctly, SEM can be used to identify and convert these consumers into actual sales, resulting in a good return on investment, which is ideal for small businesses with only limited resources.

Murphy and Kielgast (2008) describe the two different types of SEM as: pay for performance, whereby businesses pay to list website advertisements (Ads) alongside organic (non-paid) search results; and search engine optimisation, which involves optimising a website to be displayed within the organic search results.

In order to carry out pay for performance marketing, small businesses can use search engine advertising applications such as Google Adwords. Google Adwords, like Facebook Ads, allows businesses to target consumers based on specific parameters. Google Adwords enables businesses to create Ads that will display on the search results for specific keywords and phrases that they are prepared to bid for (Google 2010a). These keywords and phrases are identified by the business as the words or phrases that potential customers may type into search engines in order to find their business, product or service. In addition to this, Google Adwords allows businesses to target their potential customer further, by setting other parameters to decide when their Ads will be displayed. These parameters can be based on location, device searched from, day of the week or even, time of the day (Google 2010b).

Google Adwords can be a useful method of advertising for small businesses because, as already mentioned, it allows them to target consumers who are actively searching for products and services which suggests they are more likely to make a purchase. Furthermore, unlike other forms of traditional advertising, businesses only have to pay for Ads that have resulted in interaction from consumers i.e. when they click on the Ad. This can help to improve return on investment, which is important for small businesses that may only have a limited marketing budget. In addition to this, Google Adwords provides performance statistics for each of the keyword or phrases the business bids on, including the number of clicks, impressions, click-through rate and average position of the Ad (Google 2010c). These can then be used to optimise the Ads to further improve the return on investment. Similar to Facebook Ads, Google Adwords also allows businesses to set a maximum daily budget, which can be useful for small businesses that only have limited budgets and consequently need control over advertising expenditure.

Whilst some methods of advertising such as newspaper or radio advertisements will only reach a potential audience on a local or even national scale, small businesses can use Google Adwords to target a global audience. This can be vital for small businesses that have a niche' product and therefore could benefit from an increase in potential customers by targeting a global niche'. For example, a small business advertising large shoes for people with very large feet will only have a small potential customer base nationally and even smaller locally. However, by using SEM such as Google Adwords they can advertise globally, which will increase the potential customer base significantly (a small niche' segment becomes a very large global niche' segment).

The alternative to SEM is to use search engine optimisation (SEO) which as defined by Grappone and Couzin (2006) as the variety of tasks that improve a website's presence on search engines. One of the major benefits of SEO, noted by Amerland (2011), is that like pay-per-click advertising such as Google Adwords, it can drive targeted consumer traffic actively looking to purchase, to a business' website. Yet, unlike pay-per-click advertising, SEO has no cost other than the time required to implement it. This consequently makes it an ideal method of advertising for a small business with no available marketing budget.

In order help implement SEO practices successfully, small businesses can utilise e-commerce applications such as Google Webmaster Tools. Google Webmaster Tools provides businesses with comprehensive data about their website useful for SEO, including internal and external links, search queries, crawl errors and indexing results. In addition to this, it also enables businesses to submit sitemaps directly to Google (Google 2010d). These features can assist small businesses with optimising their website in order to improve its presence on search engines. It is also important to note that Google Webmaster 'Tools' is a free service, which also makes it suitable for small businesses with no available marketing budget. Moreover, Google provides various types of help and resource support that enables people with little knowledge or expertise to learn how to use

Webmaster Tools. This is beneficial for small businesses that may lack the necessary expertise.

SEM has become an important marketing consideration for many businesses, due to the high proportion of consumers using search engines when making purchasing decisions. However, whilst both types of SEM can be effective methods of marketing, the use of advertising applications such as Google Adwords, require an available advertising budget and therefore may not be suitable for all small businesses. SEO on the other hand, has no direct cost and the use of Internet applications such Google Webmaster Tools can further help to enhance a business' SEO efforts and overall marketing effectiveness.

The main e-commerce opportunity that social networking, e-mail and search engine optimisation creates for small businesses is the ability to execute above-the-line advertising campaigns and to sell products and services in global segments that were previously considered inaccessible (Table 5.1). There are, however, a number of e-commerce threats in that viral word-of-mouth marketing can be negative as well as positive particularly if executed poorly. If a campaign is successful it can generate very large volumes of business that can exceed the capacity of a small business that is used to a slow build-up of orders based on traditional marketing methods. This can cause customer dissatisfaction and a loss of reputation. There are also threats relating to various forms of fraud (including 'click' fraud) whilst the loss of content ownership to social media sites has also caused concerns amongst SME owner-managers. Finally, the web has become an extremely crowded marketplace, so differentiating a small company brand can involve a disproportionate level of resource input. The focus group participants all performed some form of Internet marketing with different levels of success and sophistication. All the firms had at least reached stages one and two (e-mail and website marketing) in Dini and Nachira's (2007) model, with some accepting online payments (stage three). However, none of the firms had managed to exploit a global niche' segment.

5.5 Market Research

Another important business function related to marketing is the collection of market research data. Market research can be an issue for small businesses because as Stokes and Wilson (2010) describe, whilst the collection of secondary data can be less costly and quickly obtainable, it can often be outdated and not specific enough for certain businesses. Whereas primary data may be more up-to-date and specific, it is also more costly and time consuming. As a result, small businesses may find it difficult to collect market research data due to the limited availability of time and financial resources. However, by utilising certain e-commerce applications, small businesses can collect market research both effectively and efficiently, despite their limited resources.

As already explained, one method of collecting market research is to use social networks to gain customer feedback and encourage them to share new ideas. Whilst this does not have a direct cost, this method can be time consuming and therefore small businesses could consider the use other e-commerce applications, such as Google Consumer Surveys and SurveyMonkey instead.

Google Consumer Surveys allow businesses to create custom online surveys that are then used to gain consumer insight. This is achieved by asking users to answer questions from the survey in order to access premium content on the Internet, such as news articles or videos. Once the survey has been created responses can be virtually immediate and completion time is only expected to be 7 days (Google 2010e). In addition to this, Google Consumer Surveys allow businesses to target respondents by choosing a specific audience based on options including particular demographic or geographic characteristics (Google 2010f). Moreover, Google automatically aggregates and analyses the responses straight away, allowing businesses to view results immediately (Google 2010g). This is beneficial for small businesses because it enables them to collect primary research, which is both up-to-date and from specific respondents, in a timely manner that requires no time spent collecting or analysing the actual data. Furthermore, with a price of $0.10 per response, this is a relatively cheap method of market research (Google 2010g).

An alternative Internet application that small businesses can use to conduct market research is SurveyMonkey. Similar to Google Consumer Surveys, SurveyMonkey enables businesses to create a survey and gain responses from a specific audience based upon particular criteria such as gender, age, marital status and household income (SurveyMonkey 2009a). SurveyMonkey also provides other features, including real-time response reporting, custom branding and the provision of a survey URL, allowing businesses to link the survey to their emails, social network profiles and websites (SurveyMonkey 2009b). This is particularly useful because unlike Google Consumer Surveys, SurveyMonkey provides a free plan whereby businesses are able to create the survey but have to collect the responses themselves. Therefore, small businesses can link the survey to their website in order to gain responses. This Internet application can be beneficial for small businesses because it enables them to create a survey that can then be used to collect primary research, either by themselves or by SurveyMonkey, in a relatively cheap and effective manner.

Another e-commerce application that small businesses can use to conduct a form of market research is Google Analytics. Google Analytics is a free application that collects and analyses data about visitors on a particular website, including the number of visitors, page views and average time spent on the site. In addition to this, Google Analytics can be used to measure the number of sales and conversions (such as completed online contact forms) on a particular website (Google 2010g). Businesses can therefore use Google Analytics as a method of market research in order to understand consumer behaviour and engagement with their website. This information can then be used to implement changes that can improve the online sales or other forms of conversions through the website. Not

only is this useful to small businesses by improving the effectiveness of their website but it can also help free-up financial resources that are required for other methods of market research. This is important because market research can lead to innovation and the development of both new and existing products which, as noted by Stokes and Wilson (2010), is necessary if small businesses wish to stay competitive and ultimately survive.

The use of e-commerce applications that collect data and information from consumers can further benefit small businesses by facilitating open innovation practices such as crowdsourcing. Crowdsourcing, as first coined by Howe (2006), is a practice that utilises the Internet to harness resources such as the time, ideas, skills and the expertise of many people. It can also be considered as an example of open innovation which, as described by Chesbrough (2006), involves the use of external ideas to achieve innovation. Small businesses can take advantage of crowdsourcing and open innovation by using Internet applications such as social networks to encourage people to share ideas; Google Analytics to gain an insight into consumer's online behaviour; and even payment processing technologies such as iZettle to access data and information about consumer spending, tastes and interests. Small businesses can then utilise the ideas and data collated through e-commerce applications to effectively use consumers as part of the research and development process. This enables small businesses to access a far greater research and development potential than would otherwise be possible due to their limited available resources. Furthermore, according to von Hippel (2006), involving users of a product in this process can also be advantageous because research undertaken in laboratories can ignore some of the issues that can only be identified through user interaction.

As Sandulli and Chesbrough (2009) discuss, an example of a business using open innovation through crowdsourcing is Threadless.com. Threadless.com does this by asking people to submit their own designs for T-shirts. These T-shirt designs are then voted upon to find the most popular design, which is then produced. This is useful for Threadless.com because in addition to not incurring the cost of designing the T-shirt themselves, by getting people to vote on their favourite designs, they can also understand current consumer trends and tastes without having to conduct any market research themselves.

The use of e-commerce applications to facilitate crowdsourcing should be an important consideration for many small businesses because not only does it provide the opportunities to significantly increase their market research capabilities but it can also help to support innovation, which could underpin the future success of a business.

One of the threats of crowdsourcing and open source innovation is that any competitive advantage achieved is short-lived because the ideas are easily and quickly copied from the public domain resulting in a need for the small business to be constantly updating their product/service portfolio and any differentiation advantage is therefore temporary and transient (Table 5.1). A significant proportion of the focus group participants did not undertake formal market research viewing this as time-consuming and requiring specialist skills although they did informally collect customer feedback.

5.6 Operations

E-commerce applications can also be used by small businesses to assist with business functions related to operations. According to Stokes and Wilson (2010), one of the major problems for small businesses is finding premises. This can be problematic for two reasons. First, not only can it be difficult to find a suitable location but there is also the second issue of limited financial resources and the prohibitive cost of renting an office or retail outlet. As a result, many small businesses now operate as virtual enterprises (Davidow and Malone 1992) and have taken advantage of e-commerce applications that have enabled them to operate in this way.

This reduces the need for businesses to have dedicated offices and physical storefronts, as employees can work from anywhere with an Internet connection, including their home. As explained by Radut (2009), the benefits of using these technologies to operate as a virtual enterprise include reduced costs, increased flexibility, improved asset utilisation and scalability. These benefits help make virtual businesses leaner and consequently more competitive.

The growth of M-commerce (mobile commerce) and the widespread adoption of smart phones and tablet computers (plus the impending roll out of 4G networks), has greatly facilitated this transformation. Small firms can now operate virtually using wireless and fixed line Internet connections (Davenport and Pearlson 1998).

In order for small businesses to operate in this way there are a number of e-commerce applications that they can utilise. Voice over IP applications such as Skype allow employees to communicate for free through calls over the Internet. In addition to this, Skype also provides users with several other features (some at a cost) including calls to landlines and mobiles, video calls, dial in number, screen and file sharing, instant messaging and group calls (Skype 2009). These features can therefore be used to communicate effectively with key stakeholder groups such as employees, suppliers and customers.

Another set of e-commerce applications that a small business can utilise is Google Apps for Business. Google Apps for Business is a cloud based service, which provides businesses with several applications that facilitate email, calendar and file sharing, for a relatively low monthly cost (Google 2010f). These applications can be beneficial for small businesses as they enable employees to communicate, collaborate and share data between each other efficiently. However, this is especially important for virtual enterprises because employees can be in different geographic locations and therefore cannot discuss and exchange things in the same way that they would if they were in an office environment.

An additional e-commerce application that small businesses can use to assist collaboration between employees is Asana. Asana is a cloud based task management application that allows users to easily create, assign, comment and follow tasks between them and their team (Asana 2013). As well as assisting employee collaboration, this application can also be used to manage and review both task and

employee progress. Furthermore, because it can be accessed over the Internet, employees can use it despite being in different locations.

The use of these Internet applications can help small businesses to work effectively, especially those without dedicated offices. As already mentioned, operating as a virtual enterprise or having a virtual office can be important for small businesses that have limited financial resources and cannot afford their own dedicated premises (Table 5.1). A further benefit of operating in this way, as noted by Cascio (2000), is that it allows businesses to employ people with specialist skills and expertise from all over the world rather than being limited to people based in a particular area or country.

One of the threats of operating virtually is that the benefits of-face-to-face contact and trust are lost and robust relationships are not consolidated. SME owners have the advantage of being close to customers, employees and suppliers and this advantage can be diluted through virtual working. Many of the owner-managers of the small and medium-sized firms in the focus groups didn't trust their employees with respect to teleworking which has still to take root in the UK. Some of these small business owners (particularly Herefordshire) also operated in rural areas where Internet connections were poor (the digital divide) and therefore virtual working wasn't feasible.

5.7 Human Resources (HR)

As discussed by Stokes and Wilson (2010), a common HR issue amongst small businesses is that they often lack specialist skills and expertise. As a result, this could cause small businesses to make the wrong decisions when faced with problems or opportunities where they lack experience or knowledge. This could consequently lead to the wrong decisions being made and resources being wasted.

In order to solve this issue, small businesses can make use of e-commerce applications such as Clarity. Clarity allows users to choose a specific expert from a particular profession and schedule a telephone call with them, for which they pay a specified rate per minute (Clarity 2013). This provides small businesses with the opportunity to gain advice from experts who have particular knowledge or experience that they could benefit from. As a result of this, small businesses are able to make more informed decisions which ultimately benefit the business and help to reduce the likelihood of resources being wasted. However, one of the threats of this form of human resourcing is that it bypasses valuable and trusted word-of-moth recommendations from face-to-face networks (Table 5.1). According to the focus group interviewees, trying to evaluate the level of social capital within a virtual environment was very difficult and could lead to recruitment decisions that would threaten the sustainability of the business.

Table 5.1 The opportunities and threats deriving from the e-commerce small business ecosystem

Function/process	Opportunities	Threats
Finance—crowdfunding	Improved cash flows	An unregulated market and fears of fraud
	Extra marketing exposure and awareness	Theft of the idea
	Provision of scarce start-up capital	Failure to raise funding and the impact on reputation
Finance—card payments	Increased transactions and cash flows	No standard payments platform has yet emerged
	Improved planning and the monitoring of sales trends	Expenditure on technology that has limited use due to the absence of widespread take-up—networking effects
	Good for mobile traders	
Finance—financial accounts	Improved cash flow and financial management	SME owners see record keeping as an extra cost/overhead and won't implement systems
	Better target marketing of customers	SMEs lack the in-house skills and expertise
Marketing—social networks/ e-mail/SEO	Implementation of above-the-line marketing	Viral word-of-mouth can be negative not just positive
	The SME can trade in previously inaccessible markets	Privacy/security concerns
		Click Fraud
		Loss of content 'ownership'
		Internet is too 'crowded'
		Incapacity to meet rapid growth requirements
Market research	Overcomes resource issues such as skill, knowledge and time	Ideas are quickly copied from the public domain
	A broader range of ideas	Differentiation advantage is transient
	Improved knowledge of consumer behaviour	
	An increasing level of marketing intelligence	
Operations	Low overhead costs	Traditional retail requires a physical presence
	Increased flexibility	
	Improved asset utilisation	Problems of Internet access in rural areas
HRM	Overcomes resource gaps and provides access to professional expertise and advice	Doesn't leverage face-to-face networks
		Difficult to assess social capital

5.8 Conclusion

The purpose of this chapter was to investigate how ecosystem theory could be applied to small, medium enterprises and how these firms could utilise e-commerce Internet applications to enhance and improve resource sourcing and deployment. The empirical research undertaken with small, medium-sized retail service firms in the Herefordshire and Worcestershire areas also revealed a very positive response to the opportunities highlighted by the ecosystem model. At least 50 % of the service firms that were interviewed in the three focus groups were using functional e-commerce tools similar to the ones analysed in the chapter; particularly with respect to Internet marketing and the adoption of electronic payment methods. On the other hand, many small firms were suffering from Internet connectivity problems in the rural areas of Herefordshire and were not able to fully exploit the opportunities of having an e-commerce capability. Security and content ownership were ongoing concerns of most of the small firms that were interviewed. The age ranges of the owner-managers also had an impact on their e-commerce adoption strategies, with the older generation seeing technology as a threat rather than a resource-opportunity to be exploited.

Finally, as this chapter has shown, there are a wide variety of e-commerce applications available to small businesses. Whilst not all of these may be applicable to every business (none of the interviewed firms had reached the final digital ecosystem stage in Dini and Nachira's 2007 model Fig. 5.1) it is clear that these applications provide many opportunities for small businesses to enhance their overall performance and to off-set threats to their survival prospects. The ecosystem approach could also be seen to help small businesses overcome barriers to start-up and market entry.

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Chapter 6
A Retailer Perspective of E-commerce Brand Management

Richard Nathan Rutter

Abstract E-commerce offers opportunities in the form of a complex set of directions that many traditional, 'bricks and mortar' retailers are unsure of. Bombarded by a myriad of new words and techno jargon, it can be an intimidating experience. In this context, the retailers who embrace the challenge and who are able to cultivate an e-commerce platform are able to flourish. However, this is not straightforward—and business owners and managers are often left scratching their heads at exactly what they should be focusing on. The path to a successful eBusiness can be fraught with barriers, often causing avoidance and aversion—but those businesses that exploit the opportunities of eBusiness bear the fruit of their efforts. This can particularly be seen in the likes of eBay, Google and Microsoft as well as countless others.

Chaffey (2007) likens California's history to the struggle many retailers are faced with today. In 1849, a group of settlers travelled west towards California and entered an unnamed valley. The valley presented a harsh environment and many barriers. Sound familiar? Many were lost along the way and after eventually finding a route through to the Promised Land, California, one woman turned and said 'Goodbye, Death Valley'—which then became its name.

Whilst new online ventures seem to be thriving, where does this leave more traditional 'bricks and mortar' retailers? Research indicates that the Internet influences approximately 42 % of total retail sales in the US. This includes the percentage of sales made purely online, but also transactions made offline which began via online research (Kotler et al. 2008). Further, those that do use the internet are highly likely to research potential products prior to purchase. Thus,

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retailers must be fully aware of Internet-based threats to their business, even if they do not intend to adopt eBusiness.

Internet buyers differ from traditional offline consumers both in their approaches to buying and their responses to marketing. Traditional marketing targets a somewhat passive audience, whilst online marketing targets people who actively select which websites they will visit, as well as what marketing information they will receive about which products and under what conditions—the customer initiates and controls the contract. Thus, online marketing requires new approaches.

E-commerce Management

Electronic commerce, also known as e-commerce to a large proportion of consumers, means shopping online using the internet and web pages. However, electronic commerce covers a much broader span, incorporating all of the processes related to a company which may include buying, selling, hiring, and planning. IBM take this further and define e-commerce as "the transformation of key business processes through the use of Internet technologies" (Chaffey 2011, p. 11), whilst e-commerce presents the "greatest opportunity and/or threat to existing business models since the industrial revolution" (Holsapple 2003, p. 666).

6.1 Business Strategy

Businesses operate within a commercial reality and e-commerce must deliver distinct benefits and competitive advantages in order to maximise customer value (Barnes and Hunt 2013). Organisations, therefore, must be able to strategise, plan, develop and implement e-commerce solutions—a process which is crucial to success. de Chernatony (2012) identifies common themes between strategic gurus including Thomas Peters and Sir Michael Parry (ex-chairman of Unilever) and the seminal work by Kotler et al. (2008), which define the core components of business strategy as: understanding of needs and segmentation, differentiation and position, and planning and integrated marketing strategies. Through this process, a customer-driven marketing strategy attempts to satisfy and create superior value to consumers, enabling the business to then capture this value as both profit and future customer equity (Fig. 6.1).

Business strategy and objectives provide a basis for brand differentiation and subsequent positioning. The e-commerce platform is an integral part of an integrated marketing strategy and therefore must reflect a brand's position. e-commerce strategy, therefore, must be linked back to the business strategy in order to adequately cover the strategic role, intended scope and resources available to the e-commerce project. Kotler et al. (2008) identify high level business strategies for delivering growth that may include: market penetration (existing products or services to existing markets), product development (new products or services to existing markets), market development (existing products of services to new markets) or diversification (new products or services to new segments).

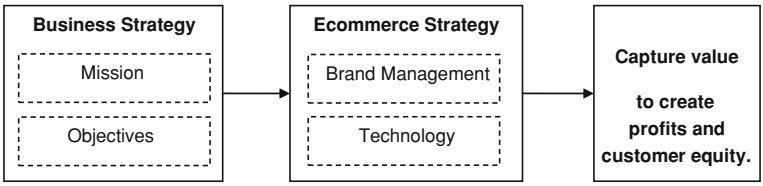

Fig. 6.1 From business strategy to e-commerce strategy

6.2 Online Business Models

We have identified that e-commerce strategy must be linked to the business strategy and mission, hence the importance of online business model selection. Timmers (1998) identifies eleven potential online business models which include: e-shop, e-procurement, e-auction, e-market, third party marketplaces, virtual communities, value chain service providers, value chain integrators, collaboration platforms and information brokers. This chapter will concentrate predominantly on electronic commerce in the form of retailers, and this section will highlight the relationship between:

- E-shops as promotion, cost-reduction, additional outlets and a means of seeking demand;
- Virtual communities as the added-value of communication between members;
- Value chain service providers to support the value chain, e.g. logistics or payments;
- Value chain integrators as added-value through integrating multiple steps of the value chain.

Thus showing how e-commerce provides an opportunity for retailers to increase profits and reduce costs.

Retailers that were previously geographically isolated are now empowered to reach small groups of customers that are spread geographically (Mohapatra 2012). Specific opportunities are presented in the way of virtual communities (Lodish et al. 2002), which allow consumers with similar interests to socialise virtually and which can be mediated by retailers. These groups of consumers have similar needs and behave in similar ways, known as market segments, which can then be targeted by marketers with distinct value propositions.

Further, organisations are able to reduce the cost of their sales handling inquiries by providing prices and availability through their IT infrastructure as well as pre and after-sales support and payment processing (Epstein 2004). Online sales also give much greater choice to customers, as well as increasing the number of customers through its 24/7 availability. As well as being able to shop at their leisure, buyers can compare and contrast value propositions from a plethora of retailers—many comparison websites have been developed to facilitate this need.

As a consequence of this, consumers are empowered to negotiate between companies in terms of price and delivery, to ensure that they receive the most competitive price. McAdams (2014) suggests this as a 'game changer' that can negatively affect profit margins. As Ariely (2009) notes, consumers prefer not to compare products that are hard to compare, thus unique value propositions (Godin 2003) which cannot be easily compared can lead to a competitive advantage.

Whereas previously exchanges could have taken place by mail order, e-commerce platforms and their customisability have almost entirely negated physical product brochures by providing customers with immensely powerful tools of customisation though filtering and sorting in order to reduce a choice of products down to their chosen purchase. Once a decision has been made, digital goods (such as software or music) can then be delivered instantly (Kotler et al. 2008).

This section has identified four main online business models as e-shops, virtual communities, value chain service providers and value chain integrators. The Sect. 6.3 will concentrate on digital brand management, an area of a retailers' online strategy that is often overlooked—but is pivotal to success in the execution of any online business model.

6.3 Digital Brand Management

An organisation's brand can be crucial to success within the online context, just as it is within offline channels. Brands have been present for as long as it has been possible to trace artefacts of human existence, and as with the offline context, the online brand definition varies and is best understood from a historical and evolutionary perspective.

Records and artefacts dating back to Egyptian times show that producers of bricks marked their products with symbols in order for them to be easily identifiable, as materials from certain areas were of better quality. Similarly, in medieval Europe, trade guilds required "trademarks" to be placed upon goods as a confirmation to a purchaser of consistent quality, while also offering a simplistic form of legal brand ownership (Farquhar 1989). The term "branding" was extended from "brand", originally the process of stamping wrongdoers, harlots (Henning 2000) or animals with embers or hot irons in order to be easily identifiable (Arnold and Hale 1940).

Today, a proliferation of brand definitions have emerged: on one hand the American Marketing Association defines a brand as a "Name, term, design, symbol, or any other feature that identifies one seller's good or service as distinct from those of other sellers", whilst on the other hand de Chernatony and Dall'Olmo Riley (1998) has extensively argued that branding definitions should include an emotional aspect. "A brand is a cluster of functional and emotional values that enables organizations to make a promise about a unique and welcomed experience." (de Chernatony 2012). Further to this he suggests that the AMA's

definition does not encapsulate the process of branding as a company culture, and views branding purely as inputs—neglecting the consumers' output.

Whilst a company can have a brand, the brand is not the company. A fine distinction can be drawn between how the company does business overall and how it is perceived by its customers. For instance the company Pixar may be an extraordinarily tough negotiator with its suppliers, who regard it as a tough experience; consumers however, may view it as fun, family orientated or even friendly.

In 2010, online marketing spend within the UK surpassed that spent on television advertising (Heinze and Fletcher 2011). However, critics of online branding argue that due to the nature of the online environment and the quantity of information available through it (as well as the increasing use of sophisticated search engines), consumers are now able to locate information, products and services that they require without relying on the traditional shorthand provided by a brand. Through utilisation of information consumers can make informed product choices, regardless of the brand (Rowley 2004a). Counterarguments claim that in the digital age, online branding is extremely important. Empirical studies have found that while using the internet for purchasing decisions, consumers with low proficiency became overloaded with information causing them to revert back to the brands they know (Ward and Lee 2000). In a similar vein, whilst social media can facilitate consumer knowledge, falsified endorsements—for instance reviews posted by a hotel about themselves or competitors—contribute to consumer confusion and overload.

Research by Marshak (2000) has shown that through an effective online presence, organisations can cut contact service costs by up to 70 %. According to the same research, 86 % of all consumer enquiries can be answered online. Meekings et al. (2003) explain how organisations can capture the economic benefits of their online presence, with key findings including the fact that 28 % of consumers wishing to buy online are prevented from doing so. By improving user experience, an average retailer could potentially increase sales by between 33–54 and 44 % of UK consumers said that negative online experiences would likely deter future purchases by them from the high street store associated with the brand.

Increasingly, more sophisticated online shoppers will insist upon doing business solely with online brands which they trust (Ha 2004). Ha (2004) researched the effect of consumer trust based on multiple dimensions: financial safety, confidentiality, brand name, word-of-mouth, good experience and value of information. The conclusion was that constructing an online brand is ambiguous, and that there is no consistent model of best fit to aid in the transference from offline to online branding. Ha (2004) also suggests that by investigating the aforementioned variables, marketers may be able to increase brand loyalty (Shankar et al. 2003) and gain a formidable competitive edge.

To efficiently nurture relationships with consumers, brand managers must understand how best to communicate their brand online. However, research shows that organisations are often making fundamental mistakes with their online branding. One example is the launch of the new B&Q e-commerce website. A new

brand was used for the domain name (www.diy.co.uk), and the new brand image for website visitors was not consistent with their prior brand image, creating initial confusion for consumers (Muller 2008). This is reflected through research which suggests that online brands should complement offline branding (Sääksjärvi and Samiee 2011), as well as a study conducted by Young (1999), in which an overwhelming majority of participants (82 %) specified that an organisation's offline brand is important in their choice to buy online.

Evidence suggests that many organisations, especially their web developers, often become preoccupied with the functionality a website offers. This results in little thought being given to the brand or corporate identity. Studies conducted using samples of library websites concluded that a high majority focused on the features and services of the website, instead of communicating images of the library service itself (Rowley 2003).

However, research has shown that simply replicating an organisation's offline brand strategy through an online presence provides low performance and is inadequate (Meyers and Gerstman 2001). This highlights the importance of research into effective transference of brands from one medium to another. Unfortunately, most research in the area of online brands is currently orientated around assessing and measuring the performance of online brands, rather than upon examining how the transference process occurs.

Offline brands are discovering that constant improvements are required when transferring to an online presence, and that different design considerations must be explored in comparison to their previous offline strategies (de Chernatony and Christodoulides 2004). de Chernatony and Christodoulides (2004, p. 238) argue that "a brand is a brand regardless of its environment; what is different is the way the brand's promise is executed". In simple terms, the basic principles of branding still remain. They are, however, evolving. In the online environment, they are required to become increasingly customer-centric, particularly through the provision of tailored information. For instance, an organisation's online presence might initially include information which communicates the brand detail, treating the user as a passive recipient. Having taken on board the unique requirements of online branding, the website becomes a dynamic 'experience', in which consumers can tailor it to fit their own requirements. This can be seen through examples such as the online banking service provided by major banking organisations. The online brand is a system of functional and emotional values, matching an anticipated brand promise through experience.

The difficulty in transferring an offline brand to an online context is compounded by the ways in which the online brand experience differs from the offline experience. For instance, within a retail store, the environment (smells, location, etc.) and staff have a notable impact upon consumer perception of the organisation as a brand (Baker et al. 1992). This is simply not possible within the online context, although multiple influences remain which affect consumer experience. Particular interest should be paid to the website's appearance, which encompasses "image" and "consistency" and is discussed further in Sect. 6.4.

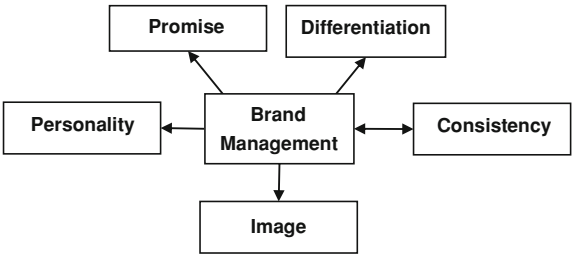

Fig. 6.2 The relationship between brand management and consumer experiences—adapted from de Chernatony and Christodoulides (2004)

Since companies cannot rely on their existing (offline) brand strategies when transferring to an online presence, they must come up with new approaches. To this end, de Chernatony and Christodoulides (2004) identify five core elements, shown in Fig. 6.2, that should be considered when taking a brand and its promise online:

1. **Promise**: The promise is the sum of all of the elements being successfully executed. Kapferer (2012) expresses this as "regular and dependable quality" and fulfilment.
2. **Differentiation**: The differential reward of one brand over another. Typically a brand will seek to compare and contrast its points of difference and parity (Kotler and Keller 2012). The key to competitive advantage is consumers finding something unique and meaningful in one brand over another (Williams 2010).
3. **Image**: The power of a brand is its ability to influence consumer behaviour in purchase situations (Kapferer 2012). These influences are as of a consequence of associations with a brand and its perceived image. These can include perceptions of competence, quality, qualities, benefits (differentiation and positioning), other imagery and a brand's personality.
4. **Personality**: Anthropomorphisation, or brand personality, provides a vital emotional connection between a brand and its consumers. A brand can develop a personality through its communications and imagery to attract and connect with specific market segments. Churchill insurance have a very anthropomorphic brand in the form of a talking dog (Hammond 2011), whilst in contrast Apple have a very clear brand personality (young, active, trendy) without using a specific non-human creature as representation.
5. **Consistency**: Brand consistency is both multi-channel and longitudinal. A brand's promise, differentiation, image and personality should be consistent with consumers' past experiences as well as between offline and online communication medium. Research has shown that brands represent crucial aspects of success in mature markets (Tilley 1999), and that consistency can be a key driver in creating strong brands (Kay 2006).

These five core elements that make up digital brand management will now be expanded upon in detail.

6.3.1 Brand Promise

The power of a brand resides in its ability to fulfil its uniquely positioned promise better than any competitor. Digital brand management execution, therefore, is about fulfilling the brand's promise within digital channels (Rubinstein and Griffiths 2001). The fulfilment of a brand promise both offline and online is crucial to building brand trust and loyalty; a consequence of perceived value and actual satisfaction. At its most basic level, an accurate description is crucial to fulfilment of a promise and satisfaction. For example, if a hotel's online booking system states that Wi-FI will be available throughout, however upon arrival it is only available in the reception area, the brand has failed to fulfil its promise; the information was either old or incorrect.

Delivering the brand promise has become increasingly pressurised within online channels. Competitors that compete via the internet often find that providing the cheapest price can be an opposing force to delivering consistent reliability and high quality service. Pressure from a globalised competition can drive prices down so far that it can be very difficult to compete whilst also providing reliability and customer fulfilment (Kapferer 2012). However, studies suggest that up to 70 % of customers check multiple media channels prior to purchase; increasingly through social media, as a sort of digital word of mouth that is commonly referred to as word of mouse (Stringam and Gerdes 2010). This mimics previous trends seen in traditional word of mouth, but now travelling much faster.

Design concerns have also morphed for online branding, with everyone being provided the same display window via the use of brand-specific websites. Companies that cannot afford to buy the best positioned property on a London high street now find themselves on a much more level playing field (de Chernatony 2012), whilst established brands are increasingly having to compete and thwart off younger competition that would previously not have proven quite so challenging. This gives much more opportunity for new companies to enter the market and fulfil customer satisfaction better than the competition, providing a better quality experience for their customers.

Websites provide an opportunity to be creative and become remarkable (Godin 2003), which can influence word of mouth, word of mouse and increasingly word of smartphone—thus affecting both online and offline branding and consumer experience. For example, LingsCars.com have made a name for themselves by being "amateurish" but are considered remarkable as they are uniquely different and positioned. The owner Ling Valentine (2014) created her company's website after recognising a "big opportunity to use an emotional bond to sell cars"—this was after observing that "other car dealers and leasing companies are quite hated, they are very impersonal". Established in 2000 with zero capital, the company now leases an average of £3.5 million worth of cars and vans each month. She attributes her success to her "**customer-focused approach, some unusual publicity stunts and a wonderfully wacky website that has gone viral**".

Now that we have highlighted the importance of a brand's promise online and successful fulfilment, the Sect. 6.3.2 will examine how brands can differentiate and thus position their brand's promise to be unique.

6.3.2 Brand Differentiation

A brand's differentiation within an online channel is its unique set of attributes which represent its value proposition. Therefore, a brand's differentiation within an offline context must be effectively and consistently transferred to the online context. Increasingly, however, brands are starting out within online channels and then transferring to an offline context.

As brands differentiate themselves online to occupy unique positioning within consumers' minds, brand strategies can face a constant battle from competitors that seek to match and negate a brand's competitive difference, or compete fiercely in order to beat a company's difference (Keller et al. 2011). For instance a war currently wages online between Walmart and Amazon (Berman 2014), which some commentators have dubbed "Goliath versus Goliath".

Whilst the most obvious means of differentiation are within a product or service itself. Kotler and Keller (2012) identify the main distinct types of organisational brand differentiation as employee, service and image differentiation:

- **Employee differentiation** involves training employees to be better than those of competitors—and employee interaction, even through digital channels, can be pivotal to a company's success online. Zapos in particular have focused on training their employees to provide individual and unique customer experiences. It goes as far as trying to bribe half-hearted trainees with $2,000 if they leave (McFarland 2013); arguing that if they take the money, they match the company's values and culture.
- **Service differentiation** refers to the delivery system a company employs in order to make a product or service better match the needs of consumers, for example an easier purchase process. This involves utilising different consumer-centric communication and distribution channels—for instance making purchasing easier, more enjoyable or more rewarding. Copacino (1997) identifies the three types of service differentiation as reliability, resilience and innovativeness. Some companies attempt to facilitate transactions with a minimum amount of consumer effort, rather than offering an abundance of choice. HMV offer a physical store experience, whilst iTunes provide a convenient and simplistic download service, which is highly profitable. Amazon provide a "1-Click" purchase process, while Argos UK provide a "Click-n-Collect" service (Wilson-Jeanselme and Reynolds 2005), something Amazon cannot offer for logistical reasons.

- **Image differentiation** provides brands with a tool to cultivate powerful and compelling points of differentiation, designed to appeal to consumers' social and psychological needs. Brand image represents a set of brand associations and emphasises the importance of image commercially. Associations include brand beliefs, brand performance, brand meaning and brand personality.

Whilst a tangible difference can offer a distinct advantage to consumers (e.g. a cheaper price), intangible differences such as service quality, brand image and anthropomorphisation can provide competitive advantages that are potentially harder to negate. Think of Coca-Cola versus Pepsi: in blind taste tests Pepsi usually performs better, however the same study conducted in which participants could see the cans resulted in Coca-Cola being rated as the best tasting (Godin 2005). Within the context of e-commerce, tangible differences often come down to price, particularly where a brand is negated in favour of a price comparison website. Image differentiation can therefore provide a competitive advantage which can be particularly effective. An example of a unique way of image differentiation would be TOMS Shoes, which in association with various charitable organisations pledges to donate a pair of shoes or eyewear/sight-restoring surgery and treatment to those in developing countries for every purchase of their corresponding products.

6.3.3 Brand Image

Brand image represents a set of brand associations (Lassar et al. 1995) that are formally defined as "consumer perceptions of and preferences for a brand, as reflected by the various types of brand associations held in consumers' memories" (Keller 2009, p. 143). This measure emphasises the importance of image commercially, arguing that stakeholders react to what they perceive as being reality (Godin 2005), rather than actual reality (Kapferer 2008).

Brand image as created through consumer brand associations includes brand beliefs, brand performance, brand meaning and brand personality:

- **Brand beliefs** are views that stakeholders have formed regarding product or service qualities associated with a brand. Beliefs are usually measured through qualitative research that asks consumers about their opinions of brands.
- **Brand performance** is defined by Keller (2008, p. 64) as "the way in which the product or service attempts to meet customers more functional needs". This is further expanded upon through attribute types—supplementary features, reliability, durability and serviceability, quality, style and design, and price structure.
- **Brand meaning** encompasses the extrinsic properties of a product, endeavouring to meet the stakeholder's psychological as well as psychosocial needs. This goes

beyond simple functional benefits, for instance: user profiles, purchase and usage situations, heritage and experience.

- **Brand experiences**, defined as "encompassing the feelings, sensations, behavioural response and cognitions which are induced by stimuli related to the brand" (Brakus et al. 2009), represent combinations of multiple brand communications—including the environment, surroundings and packaging—which create the consumer's experience and perceptions.
- **Brand personality** is that which represents the character of the brand as if it were a person. For example, research highlights that McDonald's is seen as being more competent and exciting than Burger King (Keller and Lehmann 2004). Studies in this area commonly ask respondents to rate brands on Aaker's (1997) framework of 42 traits.

Increasingly, a brand's image is experienced through technology as brands attempt to become integral to consumer daily experience—for instance 'on the go' applications for mobile phones, social applications on websites and widgets used on computers—all of which are designed to increase brand interactivity (Broady et al. 2007) and attachment. These online channels and digital mediums provide an important form of marketing communication for brands, both in terms of encouraging growth and of providing opportunities for increased customer loyalty (Flores and Chandon 2008). Brands are designing their online presence to build customer equity and provide feedback and compliment their other channels (Kotler et al. 2008) and a brand's image and metaphors such as experience and personality are communicated via their website's experience (Rowley 2004b).

6.4 Website Brand Elements

Literature suggests that brands develop their online presence in phases, usually starting with a preliminary website which simply "secures" their brand. At this point, a larger scale development begins in order to interact with consumers through a more meaningful online relationship. Keller and Lewi (2008) put much emphasis on this initial stage, as consistency between the domain name chosen and the brand name results in increased likelihood that the brand can be located quickly (Hanson 2000; Winer and Ilfeld 2002). Due to the underdeveloped nature of online branding, case study approaches have had to be adapted to provide fresh perspectives. Along these lines a study was conducted upon the McDonalds online brand (Rowley 2004b), in order to dissect the brand elements and identify how they communicated the brand values of McDonalds (Fig. 6.3).

Rowley (2004b) provided an overview of website brand elements which include the logo, graphics, copy and typography, colour, shapes, layout and combination of images:

- The **logo** is extremely important for brand recognition and identification of an online presence. It provides a powerful method of recall and the subsequent

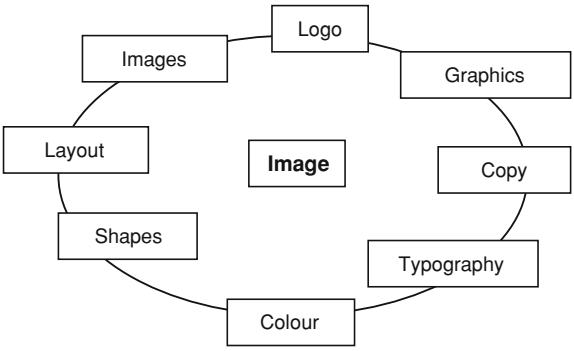

Fig. 6.3 The website brand elements (Rowley 2004b)

emotional attachments related to a brand (Rettie and Brewer 2000); other studies have highlighted that children as young as the age of 3 are able to identify and recognise a company's logo (Fischer et al. 1991).

- **Graphics** serve as a visual aid to organisational brand values, since they are a key indicator of the content and function of the page. Graphics encompasses logos, pictures and any images used. Images are an indispensable form of marketing communication, and can convey a complex story in a fraction of the time it would take to explain through prose. To use the traditional phrase, "a picture is worth a thousand words" (Burke and Dollinger 2005, p. 28).
- **Copy and Typography**: The content of the copy should be relevant to the information provided, and to the audience. This ensures effective engagement and perceived value. The text content itself positions the brand's personality, and requires a tone of voice consistent with other brand encounters. The typography and specifically the typeface refers to the choice of fonts (sizes, designs and styles) which can also be used to position personality and adjust the feeling of the page (Kipphan 2001, p. 15). The typography can also project a certain image (smart or casual) and may be utilised to increase the power of a perceived message (Willen and Strals 2009).
- **Colour** is a vital component of brand identity as it can evoke inferential associations and help to form an initial opinion on the part of a visitor. It is used to attract attention, and therefore potentially increases participation. It also serves as a part of the recognition process and can increase awareness of the brand. Colours can stimulate inferential processing, which can benefit brand claim substantiation (Meyers-Levy and Peracchio 1995). For example, a brand advertised with a red background was perceived as being more sophisticated and more exciting than a brand advertised with a blue background (Gonzalez 2005). However, specificity is also important. Even shades of equivalent colours, for instance light orange, fruit orange and dark orange, may communicate diverse and varying messages. Further studies show that higher levels of chroma

(less white dilution) elicit greater feelings of excitement and have been shown to increase likeability (Bellizzi and Hite 1992; Gorn et al. 1997).

- **Shapes**: Within art, a shape is a flat and usually enclosed area of artwork created through lines, colour, and textures. In some cases, however, it may be the inverse, and can be represented by an area enclosed by other shapes (Stewart 2006). Shapes are presented and used in many ways within websites, including shapes of images, buttons, and menus, to list only a few. The use of shapes may also include the rounded edges of text boxes, which can communicate a different styling of the brand. Synergy between other elements is crucial here, with the font used in the text or logos needing to be reflected elsewhere to ensure unity of communication. This has been dubbed the "all or none" character (Veryzer and Hutchinson 1998).
- **Layout and combination of images**: The layout of a website can be used to communicate metaphorically. For example, the McDonalds website uses the metaphor of a game, with knobs and controls for the user to "play" with (Rowley 2004b), whilst the CNN website is arranged in a column to communicate the feeling of a newspaper. It is important to note, however, that metaphors are subjective and simply a point-of-view (Leary and Hayward 1990). Other common problems involving layout include the use of too many banner advertisements, which may look disorganised and lead to many non-related marketing messages. Ambiguity in layout can also cause non-intuitive navigation of the website.

However, website branding is not without its dangers: whilst the internet provides a platform for brands to be creative and to communicate themselves, it also offers less creative brands a very easy means to copy brand elements and replicate them within their own online presence. This spectrum of 'copycatting' can range from something as illicit as downloading or 'ripping' entire websites, to designing logos and website layouts which appear very similar to competitors'. Brands must therefore remain in a constant state of vigilance, assisted with online tools such as CopyScape, which search the internet and seek out stolen elements.

Website brand elements provide an opportunity for brands to communicate their brand coherently and consistently, but equally they present the threat that a website can deviate from a core brand message. For example, this could be in the form of deviating from corporate colours, or failing to adhere to consistent use of the same logo. This has led to brands developing core guidelines which must be followed to facilitate a brand's website elements, thus matching the overall brand and communicating their core message consistently (Wheeler 2012).

'Nomophobia'—a term coined by mental health professionals—is the fear of being without your smartphone (King et al. 2010). As mobile devices such as smartphones and tablet computers become an ever-increasing part of how consumers shop and transact, brands face a new opportunity to create a brand experience which is harmonious with the computer based experience—but equally face

opportunities to create frustration (Rondeau 2005). This frustration is usually shared by brand managers when it comes to asking how website brand elements can be incorporated into mobile technologies. Specifically, managers face the issue of how to reduce brand elements into a form that is both coherent with the brand and communicates the brand effectively, but is easy to use on a 'postage stamp' sized screen.

Within online channels, brands are provided with an opportunity to control the content on each medium and channel a brand is viewed over, providing the brand with the power to manage consumer experience and to individualise to each customer through a website's customisations. Whilst this normally includes tangible elements, such as product size and colours, it can also be used with less lucid concepts—for instance tailoring a website's brand elements to personality, in recognition of the fact that each consumer is unique.

6.4.1 Brand Personality

A brand personality represents the character of the brand as if it were a person (Phau and Lau 2001; Cappara et al. 2001; Aaker 1997; Grohmann 2009). Brand communication has been described by practitioners as "getting your face out there", referring to the personality of the brand (Hopper 2012). Literature suggests that a brand is communicated both in order to connect an organisation to a target consumer, and in order to create "harmonious" perceptions and sensory experiences (Brakus et al. 2011). This in turn influences thoughts and actions by connecting the two and forming a strong and prosperous relationship. Research suggests that controlled communications are pivotal in establishing consumer expectations, as well as influencing satisfaction and attitude (Grace and O'Cass 2005).

The brand as a 'personality' is an anthropomorphisation, derived from the Latin 'anthrōpos'. It involves attributing human characteristics to a non-human creature or physical object. It is a way to sustain individuality through emphasising psychological values, beyond a brand or product's functional utility. As early as 1958, academics began to reference those 'metaphysical' dimensions which can make a store special (Martineau 1958). This includes its disposition (Pierre 1958), with King (1970, p. 14) stating that "people choose their brands the same way they choose their friends. In addition to the skills and physical characteristics, they simply like them as people".

The phenomena of a 'brand personality' has traditionally been of "intuitive appeal", especially in terms of the synergy created between a brand and its customers (Plummer 1984). As brand personality has evolved today, it represents the character of the brand as if it were a person, hence anthropomorphisation (Patterson and Hodgson 2013). It creates uniqueness by reinforcing those human psychological values to which consumers relate, beyond mere performance and functionality.

Companies wishing to develop a brand personality should adopt one that best fits their business and ensure that it is communicated consistently through all communication channels (Aaker 1996b; Kapferer 2012). If the business has a physical location and higher costs this should be a more sophisticated brand, to ensure that they are able to sell at price premium—bearing in mind that they may not be able to compete solely on price as costs (for instance purchase prices) may be higher than larger organisations (that can buy in bulk).

For many decades, companies from across the business spectrum have been aware of the importance of proper branding. Many of the most successful enterprises of the early 21st century do not even require consumers to recognise their name, as their logo or advertising jingle is sufficient to awaken a whole host of positive associations. Despite this, however, the importance of powerful and consistent online design to a business' brand image has not been taken seriously until recent times. Too often, online design has been left to technology consultants or low-ranking brand managers who fixate on functionality, whilst the core brand message and personality take a sideline (Rowley 2003).

Those companies who do take online design seriously, however, experience significantly positive results (Muller 2008). In order to understand why it is necessary to grasp the concept of 'brand as personality'. Simply put, consumers want to put things in human terms. If at all possible, they will anthropomorphise business brands, associating companies with more easily recognisable human characteristics. This can have both positive and negative effects, with some companies being seen as innovative and modern (Apple, for example) and others struggling with an image of bullying and secretive behaviour (Exxon-Mobil, Halliburton, and others). The good news is that companies can actively influence their brand personality, and those that do so tend to forge stronger and longer-lasting relationships with consumers. As repeat custom is often the Holy Grail of business life, it is clear that an appealing brand personality can be almost priceless. At which time Meekings et al. (2003) explain how organisations can capture the economic benefits of their online presence.

There are a number of ways in which organisations can actively influence the personality of their brand, but perhaps the most important is through the bespoke design of every channel by which consumers receive information from the business. It is now common knowledge that, in public speaking, only a small proportion of an audience's reaction is conditioned by what is being said. Far more important is the way in which it is being said, and the unconscious judgments being made by audience members about the speaker (Knapp et al. 2013). The same is true when it comes to considering design of communications which are intended to convey a certain brand personality. Whilst the words and content are important, the choice of layout, colour, theme and overall design are equally vital. A professional and organised look can boost an organisation well above its competition in both the conscious and unconscious judgments being made by consumers.

There are few channels of communication in which good design is more important than in the online world. Increasingly, consumers are getting their information about products and organisations from the web, email and social

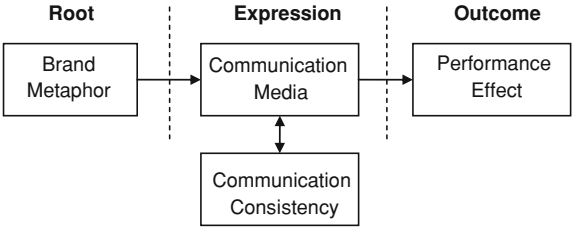

Fig. 6.4 Brand personality communication process and outcome

media—but many businesses have yet to catch up with an eye-catching and thoughtfully designed online presence. Too many websites are indistinguishable from each other, either having been plucked from generic themes available from hosting companies, or having been copied wholesale from existing successful websites. A small investment in making one's brand stand out in such an environment can yield significant benefits. For instance increased brand loyalty (Shankar et al. 2003) to gain a formidable competitive edge.

That said, brands which invest large amounts in design can still come unstuck by ignoring the vital importance of consistency in brand personality. Just as a consumer would become confused and unsettled if their local shopkeeper was radically different in appearance and demeanour each day, so can they be thrown by a constantly changing design and message from the same brand (Aaker 1996c). Too many organisations feel that in order to keep up with a fast changing online environment, they must introduce new features and new designs almost every month. In contrast, the most successful businesses understand that it can take years for a brand personality to sink into the mind of consumers, and that very careful thought needs to be put into any alterations. This is because academic research has found that consistency in the way in which a brand personality is communicated across all channels can positively affect organisational performance (Rutter et al. 2013). The flipside of this, of course, is that inconsistencies can lead to confused consumers and a drop in the bottom line.

The lessons from successful organisations couldn't be clearer when it comes to the relationship between brand image, web design and increased performance, shown in Fig. 6.4: a small investment in an eye-catching design which reflects the brand personality of the organisation can have very positive effects for any institution. This is only the case, however, if that design is consistent with all of the other communications being undertaken by the organisation, both online and offline (Rutter 2013). Ultimately, a business should be looking to examine everything it communicates through the prism of the brand's personality to ensure consistency and quality. Doing so will create and maintain a brand which resonates with consumers, and with which they will want to do business.

6.4.2 Brand Consistency

Brand consistency is the process of ensuring that a brand is continually (over time) consistent (across marketing communication), bringing many benefits such as increased efficiency of brand communications. These, in turn, can be linked to organisational performance.

This section discusses the literature which assesses why organisations should be consistent when communicating their brand, including when communicating the brand over multiple marketing media. Secondly, it examines how brands are communicated consistently to their stakeholders and lastly, conducts an analysis of the ways in which previous literature has measured brand consistency.

Brand consistency is one of the three basic rules that every global brand adheres to when communicating brand qualities, the others being clarity and constancy (Arruda 2009). The literature broadly agrees that consistent brand image leads consumers to better understand what the brand stands for and better predict its behaviour (Erdem and Swait 1998; Keller 1999; Lange and Dahlén 2003). Navarro-Bailon (2011) concluded that strategic brand consistency campaigns are more effective than their non-consistent counterparts. Arruda (2009) states that brand communications should be consistent regardless of the form of media chosen, and that this consistency provides higher levels of consumer-based brand equity (Pike 2010, p. 13) over time as part of the long-term strategy (Matthiesen and Phau 2005; de Chernatony and Mcdonald 2003; Argenti and Druckenmiller 2004; Knox and Bickerton 2003). Kapferer (2008, p. 43) extends this, arguing that brands can only develop through "consistently being consistent" over a period of time, whilst Aaker (1996a) extends this argument still further, defining consistency over time in terms of identity and position, including symbols, imagery and metaphors such as brand personality.

In order for the brand to be communicated consistently, the branding strategy also requires a consistent level of support over time, known as brand strategy consistency (Berthon et al. 2008, p. 14). The initial brand strategy relies upon understanding the needs and perceptions of customers, and is required in order to create relevant brands which satisfy consumer needs. Once these have been identified, and in order to build strong brands, the associations communicated should also be consistent over a period of time (Thorson and Moore 1996, p. 128).

The literature and research suggests that consistent brands are stronger, and also suggests that stronger brands are more likely to be communicated consistently. They also provide benefits such as increased consumer attention towards the brand (Freling and Forbes 2005, p. 406), creating stronger and more favourable brand associations. Regardless of which comes first, strong brand management requires a long term perspective of branding activities, with brand equity being enforced by marketing activities which communicate consistent brand meaning to consumers (Keller 2008).

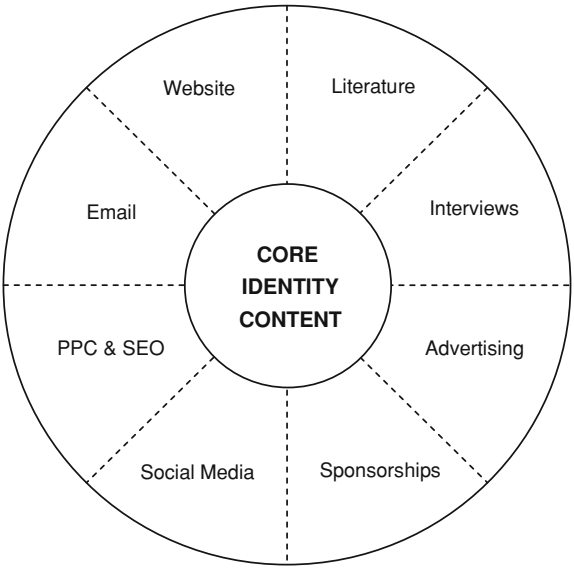

Fig. 6.5 Example of a brand communication wheel adapted from (Arruda 2009)

6.5 Brand Communication Consistency

Arruda (2009) explained that in order for a brand to be communicated consistently, planning and management are of paramount importance. In order to aid this planning process, the "Brand Communication Wheel" has been devised. The wheel encompasses all possible mediums of communication through which the brand will communicate, and posits that each marketing channel (the transmission lines of the brand) should pivot centrally around a core which represents the content theme (brand) which is to be communicated. Each segment of the wheel is required to be consistent, clear and constant when communicating the core brand content. This does not mean that communications should be repeated in an artificial manner; simply that they should be consistent in their overall meaning (Kapferer 2008, p. 211). Consistent styles of verbal expressions can exert influence upon how brand identity is processed into brand image (Franzen and Moriarty 2008, p. 120) by stakeholders. See Fig. 6.5 for an example of Arruda's (2009) brand communication wheel, encompassing multiple brand communication channels.

Once the brand communication strategy has been devised, the process of communicating the brand begins with internal (employee) brand management (de Chernatony 2002). Well executed internal brand management leads to external (consumer) brand satisfaction and vice versa. The strong links between internal brand messages and consumer experience has been noted by scholars (Finney 2008) as well as practitioners (Jones 2001), and is receiving increased attention.

It is recognised by many brands that employee alignment of behaviour with the brand plays a crucial role in building success (Vallaster and de Chernatony 2006), especially within the context of service brands, which are often employee facing (Brodie et al. 2009).

Ambler (2003, p. 177) has even gone so far as to say that "a firm's customers are its own employees". He submits that there is a strong link between employee and customer satisfaction (Schneider et al. 1998; Heskett et al. 1997), and indicates that if an organisation's main priority are its employees, external customers will be taken care of as a result (Farrell and Oczkowski 2012; Salamon and Robinson 2008; Harter et al. 2002).

Brand consistency applies to multiple facets of the brand, both in terms of definition and the media over which it is communicated. Previous studies which have sought to measure multiple channel brand communication consistency have been sparse. Research by Graham (2013) examined the communication of visual images, tone and language as achieved on the websites and prospectuses of HEIs, as well as factors such as levels of tuition fees, in order to measure consistency of brand positioning. Research by Okazaki (2006) attempted to measure a brand's online personality across multi-national companies, in order to ascertain whether these brands were communicating consistency across global markets. However, this study mainly sought to examine inconsistencies in terms of cultural online brand personality differences, indicating that whilst consistencies between cultures may differ, consistency within cultures is important.

In summary, brand identity and position should be continually (over time) consistent. Whilst this is widely accepted within the literature, there seems to be confusion as to how brands should be managed in order to achieve this consistency in communication. Key literature suggests that being continually consistent should be part of the initial planning of communication management, with consistent execution of the management plan and employee buy-in both being vital to ensure that all transmissions are communicated consistently. Previous studies that have measured consistency over multiple marketing channels are sparse. The small number which have been attempted predominantly focus on the message which is transmitted in the form of words, in order to measure brand image and brand personality (Rutter et al. 2013). Empirical research, given the plethora of anecdotal evidence advocating consistency and pointing towards its links to performance, is certainly needed.

6.5.1 Conclusion

Overall, then, it can be seen that effective brand management within the context of retail focused e-commerce is vital to business success. To return to the analogy drawn at the beginning of this chapter, a sound understanding of online brand management can make the difference between a company finding itself in Death Valley or in the Californian promised land. As can be seen in the table below,

successful brand management brings with it a host of opportunities, whilst poor performance in this area can be a serious threat to any business.

As in any section of a business, it is vital that an organisational approach to e-commerce management fits in seamlessly with an overall business strategy. In order to be effective, any such e-commerce management must take into account the vital importance of branding in modern business, and has to understand the similarities and differences that have become clear through analysis of offline and online branding. Whilst an organisation with an established offline brand should ensure that its online offering is consistent with existing communications, it is crucial that online branding should be tailored to the specific medium through which it is being communicated.

Specifically, it is important that retailers seeking to engage with e-commerce should ensure that their brand promise is fulfilled at all times, even if certain online media can introduce added pressures through price competition. As in the offline world, brand differentiation is also crucial, although there is always the threat of online media making it easier for competitors to steal or at least copy differentiated brands. On the other hand, the online world also introduces a host of opportunities for exciting new approaches to brand image, and can even refresh and revitalise an existing offline brand. Whatever image is chosen, however, the most important factors in e-commerce remain as brand personality and brand consistency. Without an effectively anthropomorphised brand which enables consumers to relate to it personally, and which is communicated consistently amongst all different media channels, branding efforts are inevitably diluted and weakened.

Ultimately, there are both significant rewards and potential pitfalls awaiting those businesses which seek to establish an online brand, whether transferring an existing brand or building one from scratch. The world of e-commerce, whilst sharing some characteristics in common with more traditional business sectors, cannot be treated as entirely synonymous with them. Those companies which take the time to study, analyse and plan their e-commerce and online branding offerings will end up ahead of their competition, and well prepared for the decades to come.

6.6 Opportunities and Threats

See Table 6.1.

Table 6.1 The opportunities and threats of e-commerce and digital brand management

Type	Opportunities	Threats
E-commerce management	• To create a customer-driven marketing strategy which attempts to satisfy and create superior value to consumers	• Lack of an organisational strategic plan to develop and implement e-commerce solutions—a process which is crucial to success
	• The geographically isolated are now empowered to reach small groups of customers who are spread geographically	• Consumers are empowered to negotiate between companies in terms of price and delivery, to ensure that they receive the most competitive price—which can negatively affect profit margins
	• The use of virtual communities allows consumers with similar interests to socialise virtually which can be mediated by retailers	
	• Reducing the cost of sales handling inquiries by providing prices and availability through IT infrastructure	
Brand promise	• Successful fulfilment of the brand's promise within digital channels. At its most basic level, an accurate description is crucial to fulfilment of a promise and satisfaction	• Delivering the brand promise has become increasingly pressurised. Competitors that compete via the internet often find that providing the cheapest price can be an opposing force to delivering consistent reliability and high quality service
	• Design concerns have morphed for online branding, with everyone being provided the same display window via the use of brand-specific websites. Companies that cannot afford to buy the best positioned property on a London high street now find themselves on a much more level playing field	• Established brands are increasingly having to compete and thwart off younger competition
	• Opportunity for new companies to enter the market and fulfil customer satisfaction better than the competition	

(continued)

Table 6.1 (continued)

Type	Opportunities	Threats
Brand differentiation	• Brands are starting out within online channels and then transferring to an offline context • Brands can utilise different consumer-centric communication and distribution channels—for instance making purchasing easier, more enjoyable or more rewarding • Image differentiation provides brands with a tool to cultivate powerful and compelling points of differentiation, designed to appeal to consumers' social and psychological needs. Whilst a tangible difference can offer a distinct advantage to consumers (e.g. a cheaper price), intangible differences such as service quality, brand image and anthropomorphisation can provide competitive advantages that are potentially harder to negate • Within the context of e-commerce, tangible differences often come down to price, particularly where a brand is negated in favour of a price comparison website. Image differentiation can therefore provide a competitive advantage which can be particularly effective	• Effectively and consistently transferring a brand's differentiation to the online context • Brand strategies can face a constant battle from competitors that seek to match and negate a brand's competitive difference
Brand image	• Create brand image through consumer brand associations including brand beliefs, brand performance, brand meaning and brand personality • Secures a brand's online presence via website brand elements which include the logo, graphics, copy and typography, colour, shapes, layout and combination of images	• Danger of people copying or imitating it, or copycat companies copying website brand elements • The opportunity to do it correctly and wrongly—provided by your guidelines • How can the website brand elements be incorporated into mobile technologies to communicate the brand effectively? There is the opportunity to do it well and badly • If you can control the medium and the channel the brand is viewed over, it gives power to the brand to control the experience and individualisation

(continued)

Table 6.1 (continued)

Type	Opportunities	Threats
Brand personality	• Create uniqueness by reinforcing human psychological values to which consumers relate beyond mere performance and functionality • Companies can actively influence their brand personality, and those that do so tend to forge stronger and longer-lasting relationships with consumers. This is often achieved through the bespoke design of every channel by which consumers receive information from the business	• Brands must chose and cultivate a personality that fits their strategy or risk failure. For example if a brand has a physical location and higher costs, this should be a more sophisticated brand, to ensure that they are able to sell at price premium - bearing in mind that they may not be able to compete solely on price as costs (for instance purchase prices) may be higher than those of larger organisations (who can buy in bulk)
Brand consistency	• To provide increased consumer attention towards the brand, creating stronger and more favourable brand associations	• This does not mean that communications should be repeated in an artificial manner; simply that they should be consistent in their overall meaning

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Part III
Consumers

Chapter 7
Online Shopping and Human Factors

Tomayess Issa

Abstract The purpose of advertising on the Internet is to promote and sell products, services and information around the world. This media is considered a quick access to information and is luring customers away from queues at shopping malls and turning them to the conveniences of the Internet. However, the online market can bring various drawbacks, which make the consumers hesitate about buying products online. This study is restricted to investigating two drawbacks of online shopping: the lack of face-to-face human interaction and lack of physical touch. These factors need to be addressed by online retailer in order to avoid the possible frustration experienced by consumers who are using online media. These problems can be prevented by addressing three factors in the user interface design of a website. *Firstly*, Human–Computer Interaction (HCI) and usability evaluation need to be considered in user interface design to increase the efficiency of the staff, thereby increasing profits, and to address the issue of safety. *Secondly*, navigation, interaction and feedback need to be taken into consideration by the website developer as they provide easy access, friendly interface, and human interaction. *Thirdly*, in order to improve consumer satisfaction, reduce operational costs and increase revenue, several methods and tools can be adopted such as 3DCart, NetSuite, and SensAble Technologies. Results from this study show that when these factors have been taken into consideration, a big difference is made to customer support services as most consumers are motivated and encouraged to revisit the Web business more often. On the other hand, this study points out that more research needs to be done in website design, especially in relation to the end-user who has disabilities.

Keywords Online shopping · Human factors · Human interaction · Physical touch

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7.1 Introduction

The Internet or The Global Internet, as most people call it, is an accurate name for certain networks of computers around the world. It is also known by other names such as Cyberspace or the Information Superhighway. The Internet itself consists of a network of thousands of computer networks utilising a common set of technical protocols to create a worldwide communications medium. Currently, the world population is 7 billion people, 2 billion of whom are Internet users (Internet World Stats 2011; Miniwatts Marketing Group 2011). This massive group of users accesses the Internet through computers and terminals at educational institutions, commercial Internet Access Providers and other organisations.

The contents of the Internet ranges from high technology research papers to low technology childcare. The total amount of data on the Internet has never been measured in current years and an estimate of several hundred Terabytes falls short by far. In addition, none of this is slowing at all. The Internet provides common services such as electronic mail, electronic news, information access, gopher, online shopping and other info-bases. These services are accessed through various application programs available for a variety of computer operating systems. All these services work over the common network structure of the Internet. The Internet itself is just a massive communication medium.

Web-based businesses are one of the easiest types of commercial enterprise to create. "In the language of business, one would say that 'barriers to entry' are virtually nonexistent. That means that anybody, with almost no money, no prior knowledge, no contact, and no friends can get an Internet account, snip and edit pieces from other people's websites and go into business by himself/herself" (Helmstetter 1997, p. 27).

Online marketing is the most rapidly growing channel being explored today. Users of this expanding medium include a range of service providers ranged from publishers, marketers, software, hardware, cloud computing services, and other products. Furthermore, online shopping is expected to reach more than 3 billion, since digital buyers worldwide are expected to increase from 334.8 million in 2011 to 653.5 million by 2016 for Asia Pacific, while Western Europe are 156.8–197.3 million for 2011 to 2016, respectively. North America, Eastern Europe, Latin America, Middle East and Africa are ranged from 156.7–192.6, 63.9–107.4, 50.3–97.5 and 30.0–73.1 for 2011 to 2016, correspondingly. According to eMarketer, B2C ecommerce sales will rise sharply to 1,321.4 million worldwide by 2016 (eMarketer 2013).

The usefulness of the Internet depends directly on the products or services of each business. There are different benefits depending upon the type of business, and whether the business is a supplier, a distributor or a retailer. The Internet is rapidly becoming an active marketplace for buyers and sellers for a fast-growing pool of consumer goods and services. Though still a small slice of the total

shopping pie, the World Wide Web, in just a few years has become a suitable outlet for manufacturers and retailers of everything from clothes, food and books to computers, toys and travel arrangements.

7.2 New Media: The Internet

The marketing media study is divided into two sections which are "traditional media which includes both mass media (newspaper, television, radio, and direct mail) and personal communications". The new media encompass interactive media such as computer, Internet, websites, computer multimedia, computer games, and others. The new media offers greater consumer control and non-linear access to a more differentiated content. This is a many-to-many model which allows consumers and firms to provide interactivity access, hypermedia content and communication through the medium of "personal interaction". Whereas, the traditional media model is based upon a one-to-many model in which the marketer directs and adapts content for the consumer.

By using the capabilities of the Internet, businesses can become more efficient and produce higher quality products, improving the commercial market for consumers. The Internet is a magnificent research tool and communications device. By searching through databases and discussion groups, businesses can find information about their competitors, generate new product ideas, solicit the opinions of consumers, and learn new approaches to the way they conduct their business.

Research conducted online obtains faster and more up-to-date information than traditional research, allowing businesses to find more essential information to integrate into their products. Companies can easily exchange data with suppliers and test new products. As the Internet makes information readily available to employees, this new technology encourages independence in the workplace causing more employees to take the initiative to find their own answers and ideas on the net. In addition, businesses are less likely to hire several specialists to iron out specific problems since answers can be found using Internet resources such as discussion groups.

The usefulness of the Internet depends directly on the products or services of each business. There are different benefits depending upon the type of business, whether a supplier, a distributor or a retailer. The Internet is rapidly becoming an active marketplace for buyers and sellers for a fast-growing pool of consumer goods and services. Though still a small slice of the total shopping pie, the World Wide Web in just 4 years has become a suitable outlet for manufacturers and retailers of everything from clothes, food and books to computer toys and travel arrangements.

The new media also improves customer relations as businesses can interact more closely with the public and understand their customers' needs. By using the Internet resources, business can make larger quantities of information available to the public than they could via traditional media. For example, consumers can

easily access Web pages with lists of commonly-asked questions and answers when they have difficulties with products. In addition, through the new media, consumers can shop from the privacy of their own homes 24 h per day without the interference of sales people. By posting important information about their products, businesses allow consumers to educate themselves about the products at their own pace. Consumers can instantly access only that information which is pertinent to their needs.

By implementing Internet technology, businesses are improving the commercial market. They save time and money while increasing consumer satisfaction and business profit. Since the new media spans many countries throughout the world, companies are able to have an international presence at low cost. Finally, on the Internet, every business has an equal opportunity to sell its products and the companies with higher quality products and better customer service will succeed. The effects of commercial Internet use will benefit both businesses and consumers and change the marketing techniques of the future. So, what is meant by online marketing?

Online marketing "is a system for selling products and services to target audiences who use the Internet and commercial online services by utilising online tools and services in a strategic manner consistent with the company's overall marketing program" (Janal 1995). The Web has opened up the entire Internet for sales activities. The Web page can accept data entry, and can allow for direct secure sales, either through a website or in a cybermall or virtual storefront. Most companies with Web pages offer a large assortment of Information-rich files about their products, their industry and related subjects. Most business websites display product descriptions, pricing and purchase information but it is more important for them to make the website interactive and interesting and provide reasons for it to be visited repeatedly.

On the other hand, online ordering is becoming increasingly common. Often, this involves an initial setting up of an account for an individual by sending a credit card or other sensitive information via fax, telephone or postal mail. Marketing on the Internet can be accomplished by gaining visibility. A website can be considered as a virtual corporate headquarters for a business whereby the seller can market and sell products and services. The Internet has great power for marketing and spreading the good word about a business; conversely, it also has the power to damage a business's reputation.

A recent study (AT Kearney 2013; Tak 2013) indicates that 37.3 % of world's population is now online. North America leads with 78.6 % followed by Australia with 67.6 %, Europe with 63.2 %, Caribbean with 42.9 %, Middle East with 40.2 %, Asia with 27.5 % and Africa with 15.6 % in usage of Internet. The Internet is mainly used on a daily basis for various purposes: research 62 %; banking 50.1 %; shopping 58 %; meeting people 15.2 %; information about health 62.2 %; making travel reservations 43 %; looking for jobs 45.5 %. With such a large jump, online retailers can expect a lot of competition for this revenue. In addition, it is necessary to understand the gaps between online retailing and traditional retailing in order to win over customers.

Online marketing is a new branch of an old tree. It is marketing which can be defined as the process of satisfying human needs and wants with information, services or products, through the exchange of money. To be a successful online marketer, one needs to know the basics of the marketing process. The basics include needs assessment, market research, product development pricing, distribution, advertising, public relations, promotions and sales.

Online marketing has its roots and basis in traditional marketing concepts but branches out in a most important manner—"interactivity". Suppliers now have the ability to deal interactively with consumers at any time of the day or night in their home or office. The buyers can interact with their suppliers in a new two-way, not one-way, communication.

Therefore, the difference between online marketing and other forms is the technology itself. Communications messages on computers replace paper with the on-screen displays of information, text, art and sound. Principles of layout design typography and art need to be reconsidered when communicating with an online audience. In addition, computers allow communication to become an interactive, two-way process, unlike print and television advertisements, which are one-way processes. Simply uploading ads to online services will mean a company will miss the chance to take advantage of technology and its tools to empower the messages.

From the above, we learn that there are various advantages to consumers of using online retailing such as quick access to the information, 24/7 availability, sustainable and easy and comfortable shopping compared to the long queues at shopping malls (Ferreday 2009; Jaing et al. 2013).

Online shopping is the ideal medium for the twenty-first century, from both the merchant's and the consumer's points of view. Most consumers today are looking for ways to streamline their shopping to get it done quickly without compromising on price or quality; at the same time, they demand a high level of service and they really appreciate personalized contact. However, online shopping can bring various types of drawbacks, which make the consumers fear buying more products online. These drawbacks can be represented according to security, privacy, and speed of access, mass penetration, and lack of navigation standards.

Two problems related to online shopping are the lack of face-to-face human interaction and the lack of physical touch, both of which need to be addressed to avoid user frustration. Users can become annoyed by a lack of responses from websites and poor customer service. However, at this stage, we found that online shopping is focusing on problems of security, privacy, lack of information about product quality and a lack of trust in the retailer.

7.3 Human–Computer Interaction (HCI)

If computers are to be widely accepted and used effectively, they need to be well designed. This is not to say that all systems have to be designed to accommodate everyone, but that computers should be designed for the needs and capabilities of

the people for whom they are intended. In the end, users should not even have to think about the complexity of how to use a computer. For that reason, computers and related devices have to be designed with an understanding that people with specific tasks in mind will want to use them in a way that is seamless with respect to their work.

Systems designers need to know how to think in terms of future users' tasks and how to translate that knowledge into an executable system. This can be accomplished by establishing a good interface design to let the user interact and deal with the computer without any difficulties and to let the user have more control of the system. In the past, studying Human–Computer Interaction (HCI) tended to come later in the designer's training, but most of the research has found that this was a mistake. The Interface is not something that can be plugged in at the last minute; its design should be developed integrally with the rest of the system. It should not just present a "pretty face"; but should support the tasks that people actually want to do, and forgive the careless mistakes. At this stage, we need to consider how HCI will fit into the design process. Therefore, what is meant by HCI?

Human–Computer Interaction (HCI) "is about designing computer systems that support people so that they can carry out their activities productively and safely" (Preece et al. 1994). HCI has a role in the design and development of all kinds of systems, ranging from air traffic control and nuclear processing where safety is extremely important, to office systems, where productivity and job satisfaction are paramount, to computer games, which must excite and engage users.

The term Human–Computer Interaction was adopted in the mid-1980s as a means of describing this new field of study. This term acknowledged that the focus on interest was broader than just the design of the interface and was concerned with all those aspects that relate to the interaction between users and computers. The implementation of HCI can be perceived as an art because it requires a comprehensive range of skills, including an understanding of the learner, an appreciation of software engineering capabilities, a rigorous instructional design and application of appropriate graphical interfaces. "If we are to be recognized as developers with professional capabilities, as competent practitioners, then it is critical to understand what makes an application interactive, instructional and effective" (Sims 1997).

7.4 Usability

The usability stage is an effective method by which a software development team can establish the positive and negative sides of their prototype releases, and make the required changes before the system is delivered to the target users. This methodology provides less disruption to the actual knowledge domain and task areas for the relevant clients. Therefore, usability is furnishing HCI specialists with an idea about efficiency and effectiveness of the system, which means that the users can quickly understand the system without any difficulties. Computer

systems with good usability can improve the performance of the workforce, improve the quality of life, and make the world a safer and more enjoyable place to live in. There are a number of ways in which the user can communicate with the system, two of which are interaction and interactivity.

At the highest level is batch input, whereby the user provides all the information to the computer at once and leaves the machine to perform the task. The approach involves an interaction between the user and computer but does not support many tasks well. Interaction includes user and the system, and both participants are complex, so HCI specialists need to understand the way they communicate and the task to be executed. An interface should be well presented and designed to allow a successful interaction between these participations (Dix et al. 1998, 2004). Interaction can help the HCI specialists to understand exactly what is going on in the interaction and identify the likely root of difficulties, as it compares different interaction styles and considers interaction problems.

The second way in which the users communicate with the system is by interactivity. Interactivity can be defined from recognition rate for speech to recognition and feel of an interface environment comprising icons, pointers, ribbons, dialog boxes and bottom (Dix et al. 1993, 1998). The implementation of interactivity can be perceived as an art because it requires a comprehensive range of skills such as understanding the learner, importance of rigorous instructional design, appropriate graphical interfaces and appropriate software engineering capabilities. Finally, interactivity is considered an important issue as it focuses on three factors in Human Interaction Computing: instructional design, graphic design and communication design. At this stage, interactivity in learning is "a necessary and fundamental mechanism for knowledge acquisition and the development of both cognitive and physical skills" (Sims 1997).

If we are to be recognized as developers with professional capabilities and as competent practitioners, then it is critical to understand what makes an application interactive, instructional and effective. Moreover, in order to achieve a safe and user-friendly system, the HCI specialists need to consider the main issues and factors in HCI design. These factors can be divided into (Preece et al. 1994) (Fig. 7.1).

7.5 Keys to Successful Website Design

When developing a specific strategy for creating a successful Web-based business, it is natural to begin by thinking about a business model, the goods or services to be sold, how these will be made or established, how they will be sold and finally, how to attract consumers to the website. All these questions need to be answered first before employing Web page designers, buying top computers and monitors and the most sophisticated software for creating a website. Good promotion of a site brings customers to the business's front door. An attractive and professional-looking site constructed around a good concept makes them eager to stay and look around.

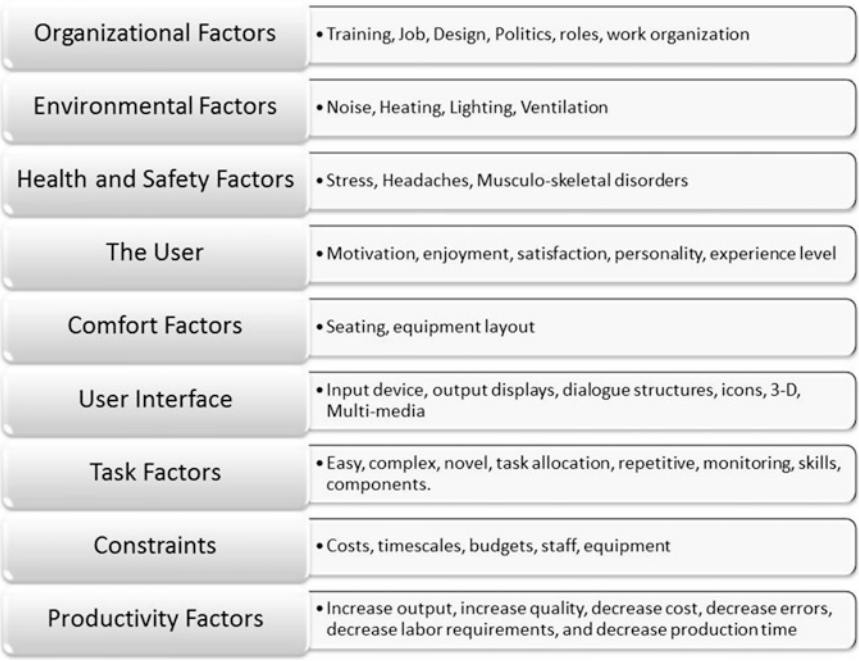

Fig. 7.1 Factors in HCI design—Preece et al. (1994)—Prepared by the author

Furthermore, several issues should be on the business agenda in order to develop an online business including user participation, integrating different knowledge and expertise from various subdivisions, and finally, undertaking the design process (Preece et al. 1994; Sharp et al. 2011). The most important issue which needs to be kept in mind is user participation. Consumers can play an important role in electronic markets (Issa and Isaias 2012; McNamara and Kirakowski 2011). Consumers may collaborate not only in idea generation and product design, but also in the marketing communication effort itself. This is because interactivity in the Web gives consumers much greater control of the message. The Web gives the consumer much greater control over the search for information, which is useful for consumer decision-making. The Web allows the consumers to become active participants in the marketing process.

Participation refers to the role that users can play in assisting with the design and development of an effective website or system. According to Hartwick and Barki (1994, p. 441), participation is defined as the "behaviors, assignments, and activities that users or their representatives perform during the ISD[1] process", and it "reflects what specific behaviors are performed, how many of these behaviors are performed and how often they are performed" (Hartwick and Barki 2001, p. 21).

[1] ISD: Information system development.

If the designers work very closely with the users to produce a successful system (or website), then less time will be required for the implementation and testing stages, and this will lead to the user working with this system (or website) with less frustration and dissatisfaction. Finally, Issa (2008) confirms the importance of user participation in the website development process as a means of obtaining more information about the problems and alternative solutions from the users and to familiarize them with the system before it is released. At this stage, we need to consider the three elements of website design, which are navigation, interaction and feedback.

Navigation is a very useful tool in the design of Web pages as it helps people to find their way around and make things easy to find in the website. However, if the users have trouble finding anything or get lost within the website they will become discouraged and frustrated.

Navigation is a serious matter in the electronic environment. Several studies (Fleming 1998; Lavie et al. 2011; Lazar et al. 2003) confirm that accurate navigation in the website design will assist the consumers to locate his/her tasks easily. Moreover, the Web designer must provide an electronic site map to allow consumer to know where they are at all time. Finally, a Web designer needs to spend a good deal of time on navigation issues, as most of the designers consider this step to be very critical.

Interactivity is the degree to which user actions change the content of a website. "Clicking the 'back' button of your browser changes the page, which is a very low form of interactivity. Filling in forms that lead to a customer-generated page is medium interactivity. Chatting in real-time with other users and playing multiplayer games are examples of high interactivity" (Helmstetter 1997).

The World Wide Web is not a very interactive place as too many choices can create chaos and confusion. In designing a website, it is necessary to strive to keep visitors engaged. A long block of text will make their eyes glaze over. Too many clicks will frustrate consumers. In determining the level of interaction that is best for a particular product and a particular set of customers, one must remain conscious of the state of the technical art. Finally, interaction is a very useful tool in the designing of a website, as, throughout, the visitor can leave feedback, send e-mail, leave comments, order, chat, exchange or post messages. Via interaction, consumers can build a good relationship with the supplier and feel more confident to return to the website.

The third element which needs to be considered in website designing is feedback. Feedback is a very useful tool in website design as a business will obtain new ideas about consumer requirements, as well as the opinions of the consumers in respect to the products, services, information and website design. Most of the businesses provide a link to a page with an open-ended feedback form. This approach is useful as suppliers can include a couple of fields in the form to solicit answers to specific issues (i.e. where the consumer found out about the suppliers) (Allen and Bentley 2012; Beaumont et al. 2011).

In general, businesses on the Internet are always available 24/7 which means e-mail, feedback, and chatting is received daily from the consumers who are

dealing with the website. At this stage, businesses need to build a staff of people to handle the incoming mail from the website. By adopting this step in online businesses, consumers will build a public relationship with their suppliers who make the consumers feel secure and satisfied.

This step is very helpful and effective as it reassures and satisfies consumers that there is someone to respond to their requirements. In addition, this step provides comments to the suppliers in respect to the quality of their products, services and website design. The website market is an essential and outstanding opportunity for businesses to improve the relationship between themselves and consumers, by providing the necessary information, activities and service. Furthermore, businesses must cater for consumers' needs in order to maintain the relationship.

Hence, designers need to study carefully the above issues in order to provide a successful website. Moreover, to refine and enhance the facilities in the Web design, we need to be aware of two vital business objectives: to improve the business and to ensure customer satisfaction (Lee and Koubek 2010; Sheridan 1999). To achieve these objectives, the following should be considered when designing a website:

- Look at someone else's page. Look at other pages critically. If you see something you like, view the page with its HTML code to see how it was done.
- Determine the purpose of your website.
- Compose for the Web. Composing for the Web is more than just providing links to let people navigate all over the place; it means moving beyond linear thinking.
- Do not put too much on one page.
- Be clear. Be sure that someone else can understand what you are trying to say. Be sure you are accurate in what you do say.
- Stay on track and be consistent and logical.
- Check the look of your page on several different servers and web browsers.
- Double-check your work, and then check it again.
- Register your Web page with a Web hosting service.

Most of the businesses around the world have started to use the capabilities of the Internet which allow them to become more efficient, produce higher quality products, and improve the commercial market for consumers. To achieve all these, businesses need to build a virtual market on the Internet. This market usually displays information about products, and includes a transaction section for purchasing and shopping, and most importantly, provides a tool for feedback. However, some of the Web pages on the Internet are considered as Bad Web pages because the designer did not carefully analyze or study the requirements of the particular business or consumers, which results in the website being unfriendly and not easy to navigate. Nielsen provides a list of common mistakes made when designing Web pages, namely: bad search, PDF files for online reading, not changing the color of visited links, non-scannable text, fixed font size, page titles with low search engine visibility, inconsistency, need to open new browser windows and finally, not providing the capacity to answer users' questions (Nielsen 2011).

On the other hand, successful websites have the following characteristics; Good Web Pages:

- Are well-organized and easy to use;
- Contain valuable content;
- Are Attractive;
- Contain up-to-date: information is current and all the links work;
- Include contact information, such as e-mail link to the author;
- Do not require users to sift through layer after layer before they access useful information;
- Have text that is readable and are consistent in their design;
- Have clear navigation aids; and
- Have a URL that is easy to remember.

Bad sites have the following characteristics. Their Web pages:

- Are unattractive;
- Contain old information;
- Have misleading or inadequate titles/heading/links;
- Try to put ALL of the information on a single page or bury all the information under numerous menus;
- Infringe copyright or contain plagiarized material;
- Overuse all the available bells and whistles; and
- Leave the user wondering about the purpose of the site.

Finally, when designing a World Wide Web site for an online business, three issues must be considered by the site designer: navigation, interaction and feedback. If incorporated successfully, these features will provide easy access, friendly interface, and human interaction by allowing for interaction and feedback. Finally, the difference between good and bad Web pages is a matter of determining what it is that makes them good or bad, and providing solutions which will ensure their success.

7.6 Methods and Tools for HCI and Physical Touch

Most organisations around the world have begun to adopt the Internet as the second choice for doing business, because this medium allows suppliers to save costs and offer a convenient mode of shopping which will attract more consumers to Internet stores. However, many consumers are beginning to complain about online services, as most of them are annoyed and frustrated by the lack of feedback from certain websites (Lazar et al. 2003; Tuzovic 2010). Therefore, interaction is a very important concept in online shopping as it enhances various aspects not only on the consumers' side but also on the suppliers' side. To accomplish the above, the Web developer staff needs to consider various issues such as Human Interaction and Physical Touch by using different tools such as 3DCart and NetSuite and SensAble Technologies.

To make e-business grow on the Internet, suppliers need Web software such as Volusion, Shopify, Ashop commerce, Pinnacle cart, ProStores, Web.com and Shopsite (10 TopTen Reviews 2013), which can manage the products and facilitate interaction with customers, as each software has specific features and benefits. Finally, it is necessary to determine the characteristics which will help the Web designer to produce a successful site. Before working with this software, designers must consider the specific characteristics that will ensure a good Web design.

First of all, the two key features which need to be considered in order to create a successful design are: having a well-designed, user-friendly and strong company brand and letting the retailers listen to Web users. This can be achieved by considering, the following features:

- Screen should always be formatted so that the various types of information, instructions, and messages always appear in the same general display area.
- User needs are understood and captured.
- Dialogue is limited to one idea per frame.
- There is provision for messages to inform the end-user whether or not the information has been entered correctly.
- The use of dark or light colors should be avoided, especially for the background, icon, or buttons.
- Overuse of display attributes such as blinking, highlighting and reverse video should be avoided as this can be distracting.
- Three types of navigation should be used in the website design, namely hierarchical (apply for website with rich information i.e. library). Global (apply for website to logically moving from one page to another) and finally, Local (apply to website where is depth of information within broader areas) (Lavie et al. 2011; Te'eni et al. 2007).
- The design process should be made iterative which involves checking Web server performance with different levels of traffic to the website.
- Users should be shown pre-designed Web pages to check for any error messages on the Web.

7.7 Human Interaction Tools

To address the human factors, which include Human Interaction and Physical Touch, the Web designer needs to adopt various types of technologies in the websites to enhance the above factors. This section will focus on two companies, which are trying to strengthen customer services and human interaction on the Web businesses. These two companies are 3DCart and NetSuite (3DCart 2013; NetSuite 2013).

3DCart Technologies is considered the expert in human interaction on the Internet as it provides various types of services such as shopping cart software, eCommerce Web Design, eCommerce Marketing, SSL certificates and eCommerce

hosting. This technology is an Internet customer's service solution. It helps the online shopper to build stronger relationships with the customers and to improve human interaction and human touch factors. 3DCart technologies provide various types of products and services to the online shoppers so that businesses can improve their services and increase their profit with fewer costs.

NetSuite is customer relationship management software intended to improve user satisfaction, attract new customers, and reduce costs. This Web-based customer management technology provides cloud computing interface solutions for sales, support and service. The purpose behind adopting this technology in the Web businesses is to make the website an effective information resource for the customers. Moreover, this technology is quick, easy to implement and simple to administer from the Web browser and is a cost competitive solution that delivers almost instantaneous results.

This new technology enables the tracking of customer service and customer satisfaction in real-time and provides automatic responses to customer questions from anywhere and at any time. These facilities or services will benefit the end-user and supplier at the same time, as the end-user obtains information and the supplier reduces customer service costs and provides e-service for their Web business.

Currently, NetSuite commerce as a service (CaaS) is considered to be the first and only commerce solution with B2C retail and B2B businesses in the agenda. This technology will assist businesses to meet customers' expectations and needs in terms of the website aims and vision.

NetSuite commerce will capture favorites and communications into rich customer outlines to support marketing, promotions across all channels. NetSuite technology includes several services, namely: merchandising, pricing, promotions, payment processing, support management and customer management. The Netsuite SuiteCommerce platform includes the following technologies:

Suite commerce experience is the front-end Web store, built on responsive-design principles, giving designers flexibility to create any customer experience, from altering the page layout to changing the interaction design. SuiteCommerce Experience: adapts to different resolutions on mobile devices and supports interaction models suitable to touchscreens, such as swipe pagination.

SuiteCommerce Services is a back-end commerce functionality and data as services to the SuiteCommerce Experience and any other commerce front-end touchpoint. These services, combined with SuiteCloud development tools, enable the user to develop and use new business logic across multiple touchpoints. The SuiteCommerce Operations Platform provides core native business processing capabilities to run modern commerce operations from a single, integrated system delivered via the cloud.

Finally, from the above, we understand that Netsuite is very easy to integrate into any business plan as it reduces expenses and increases revenue. The benefits include visitor interaction with the site, with many visitors searching for information that supports a purchase decision.

3DCart technology allows businesses to sell and promote products online, and consumers can place orders with comfort. Adopting this technology in online business will make the website effective and efficient for consumers, as it is quick, easy to implement and simple to administer. The 3DCart technology features are available to develop and edit online storefront software easily from anywhere and anywhere, as businesses can manage their store over the Web, control online and offline payment options, set up real-time shipping options, contact customers; manage the shop inventory, and much more, all without writing a single line of program code.

Security and privacy are essential aspects for any online shop, so using the 3DCart facility will allow businesses to control eCommerce software over the Web using a secure administration interface. 3DCart controls all the technical aspects of an online shopping cart including consumer data, shop inventory and invoices. 3DCart offers various types of services such as shopping cart software, eCommerce Web Design, eCommerce Marketing, SSL certificates and eCommerce hosting. The shopping cart in 3DCart aims to assist consumers to start an online business by adding a shopping cart, and provides the support and technology needed to develop, promote and enhance the consumer online business.

The art of eCommerce Web Design is essential for 3DCart, since the designer can identify the necessary tasks which are required to develop and design the website from color, text, navigation, graphics, fonts, and other aspects. Once the website is ready, the 3DCart will assist consumers to promote and market their website via various channels from social networking to traditional marketing media. Furthermore, for security and privacy on the online shopping website, 3DCart provides SSL certificates to secure sensitive information; i.e., credit card number, social security number and login credentials are transmitted securely between consumers and businesses. Finally, 3DCart provides eCommerce hosting for all eCommerce activities.

Lastly, the 3DCart technology is very easy to integrate into any business plan; moreover, it reduces expenses, enhances customer satisfaction, and increases revenue.

7.8 Physical Touch Tools

Most of the businesses around the world have started to adopt new technologies to enhance the physical touch factor in their online businesses. Physical touch is a very important concept in online shopping as the end-user can obtain responses regarding the item on the Web. Furthermore, online shoppers have started to adopt the 3D software, as users can press any button to rotate the item in any direction. The Web's migrations from catalogue to shopping destination will not stop at animated 3D images. One day the end-user will be able to reach out and touch the things in the Web. For example, SensAble technologies is called 3D Touch, which

allow consumers to use their sense of touch to interact with objects on the Web digitally (Geomagic 2013).

3D Touch is revolutionizing the way people work in 3D on computers. It allows people to interact with digital objects and data exactly as they do in the real world. To make 3D Touch work in the Web businesses, three elements must work together, namely: Geomagic Claytools, and Geomagic Freeform plus.

Geomagic Claytools, are a true 3D interface with force feedback which enables consumers to use their sense of touch to create and generate virtual clay models. An example of a Geomagic Touch device is Haptic Device.

Geomagic Freeform plus, is a unique interface used to facilitate fast 3D modelling for designing models for prototyping and manufacturing at less cost and with effective performance. This software includes a Phantom device, a true 3D interface with force feedback.

Finally, according to the Geomagic, SensAble technologies are providing a more natural and intuitive interface for their end-users that improves their productivity and streamlines the animation design process.

7.9 Discussion

This research focuses on online shopping and human factors, which are important considerations when designing any website as, through them, the end-users can interact more with the suppliers in real time. This research is divided into three sections:

Firstly, it seeks to identify the reasons behind adopting this new media—Internet—in businesses, as most agree that this media is quick and easy, enhances business, increases profit and revenue, and reduces operational costs. Moreover, most end-users have started to use the Internet to increase the interaction between the consumers and suppliers and have quick access to information. In addition, it is easy to use.

Secondly, online shopping can bring various types of drawbacks which make the consumers fear buying more products online. These drawbacks are privacy, slow access, security issues, lack of navigation standards, and human factors. This research focused on the two human factor problems, Face-to-Face Human Interaction and Lack of Physical Touch, as these need to be addressed to prevent consumers from becoming frustrated when engaged in online shopping.

Thirdly, a solution was arrived at in this research to resolve and enhance the Human Computing Interaction and Physical Touch by adopting several technologies. These technologies are a very important concept in any Web business as they enhance and improve the online customer services, and end-users will have the chance to obtain answers in respect to the services, products and quality very quickly.

Various types of problems have emerged from online shopping including privacy, security, poor navigation and finally, the lack of Human Interaction and

Physical Touch. These problems affect not only the supplier but also the consumer, who will become frustrated and confused and s/he will not return to the website.

This research considers two of these problems: Human Interaction and Physical Touch factors. These problems appear to be very important in online shopping, as online Web business is the locus of the interaction and communication between supplier and the end-users. However, if these factors have not been incorporated into the Web design, the suppliers will start to lose consumers as well as profit and revenue, while the consumers will not return to a website that provided little or no support or customer service.

These problems can occur when the Web developer designs a Web business online without considering and involving the end-user in the Interface design stage, since most believe that Interface is an unimportant issue, as it can be attended to in the last stage of the design. This can cause many problems to the suppliers as well as the end-users. Human interaction is considered a very important factor because, if taken seriously into consideration, it can assist the suppliers to reduce costs and increase profit while the end-user can receive assistance and answers to questions without waiting for a long time.

Therefore, the website designers need to focus on and consider the human issues first and foremost, not only the technology issues when designing the website in order to meet user requirements in the Internet environment. In addition, by taking the human factor into consideration, well-designed websites can enhance and promote online customer support and satisfy both the suppliers and end-users.

To prevent this problem in the Web business, the online retailers need to address these problems as their first priority when designing any online shop. Most of the online shoppers agree that human interaction and physical touch are very useful in the business community. These tools will help increase the efficiency of the staff, and thus make more money as well as provide another important benefit: reduction of time and costs for both the supplier and the end-user.

Before the website developer adopts these methods, s/he needs to consider three issues which are very significant in the Web design. These considerations are navigation, interaction and feedback as they provide easy access, friendly interface and human interaction by using interaction and feedback facilities.

Finally, website designers need to take into consideration the various technologies available to them when designing websites so that clients' websites will make businesses more profitable and enable them to flourish.

Various issues affect website design besides the Human Interaction and Physical Touch factors. This research focused on the human factors which have begun to affect website businesses, as many consumers have started to complain about online services because they are annoyed and frustrated by the lack of feedback from the websites.

7.10 Future Research

Further research needs to done in respect to website design, especially regarding maintenance, WYSIWYG (with the Web, it IS true to say that what YOU see is what YOU get. However, what YOU see is not always what everyone else gets) and Anonymity (it is possible to predict a "possible" user base, but Web designers are essentially designing a website for an "unknown" audience). By preventing the above problems from occurring in website design, the interface will become easy to handle and user-friendly and both the supplier and end-users will be satisfied.

Moreover, further research needs to be carried out to determine the specific needs of end users who are impaired by disabilities related to vision, physical limitations and hearing. Moreover, people with physical limitations need specific hardware and software in order to make the interaction easy and user friendly. Finally, software and hardware need to be considered for people with hearing disabilities to make Web interaction easy and friendly by introducing multimedia systems in the Web design.

7.11 Conclusion

This research has focused on two of the major problems facing the online shopper: Human Interaction and Physical Touch. These problems need to be addressed by the online shopper to avoid the frustration of consumers who are using online shopping, as most of them are annoyed by a lack of responses from the websites and poor customer service. To make the business flourish and fruitful, the supplier needs to answer and meet user requirements regarding services, products and prices. If end-user demand and requirements are dispersed, frustration will occur.

To prevent this problem, the online shopper needs to adopt one of the methods and tools which are used to improve human interaction and physical touch in the Web business. For example, 3DCart and NetSuite offer a vast number of services to the online shopper to improve their online customer support. These technologies can track customer service as well as satisfaction in real-time and provide automatic assistance from anywhere and anytime. Finally, the adoption of these technologies for an online shopping website will reduce expenses and enhance customer satisfaction.

Adopting the above technologies in online shopping will help the website businesses to increase revenue, improve overall customer satisfaction, increase customer loyalty and retention, improve service levels and decrease operational costs. In addition, these technologies are easy and quick to install and can meet the needs of suppliers and end-users simultaneously.

The final technology adopted in online shopping to improve physical touch, is SensAble Technology. This technology has the ability to enhance the applications with 3D-touch, providing a more natural and intuitive interface for their end-users

that improves their productivity and streamlines the animation design process. Finally, SensAble Technology allows people to interact with digital objects and data exactly as they do in the real world.

Finally, to make the Web businesses fruitful, effective and highly productive, the website designer needs to take into consideration these technologies which can make a big difference in the Web business. The adoption of these technologies will lead to consumers revisiting websites more often, and improvement will occur in consumer satisfaction, retention, and increase in profit and revenue; moreover, operating costs will decrease.

A.1 Appendix

A.1.1 Opportunities and Threats of Ecommerce

Ecommerce opportunities	Ecommerce threats	Solving threats
Communication/ collaboration	Security	Encryption • Symmetric key encryption • Public key encryption • Digital envelopes • Digital certificates and public key infrastructure
Sustainable business	Privacy	Securing channels of communication • Secure sockets layers • Secure hypertext transfer protocol • Virtual private networks • Firewalls • Anti-virus software
Interaction/chatting	Phishing and identity theft	
Delivery of information, products, services or payment by electronic means	Credit card fraud	
Buying and selling of products and information online	Denial of service	
Cost cutting	Sniffing	
Increasing the speed and quality of service delivery	Technology and design problem in the eCommerce websites will cause delay, and a customer never returns	

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Chapter 8
Culture Dependent Benefits of E-commerce: A Consumer Perspective

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Abstract The Internet has been identified as the world's fastest growing marketplace (Adapa 2008), continuously increasing in customer volume while traditional brick and mortar shopping decreases (Li et al. 1999). It is suggested that such growth is because customers nowadays value convenience and freedom from time and location limitations. It is not a surprise therefore that many businesses want to take advantage of this form of trading to gain access to global e-markets. At the same time however, a significant discrepancy of frequency of online shopping is noticeable across countries, which means that not all e-businesses can benefit equally from online trading. This inconsistency across countries in online shopping appears to be due to misunderstandings related to different cultural requirements, which according to Tan et al. (2007) have been found to have a direct effect on whether or not online shopping is adopted. Their evidence is preceded by research from Anant (2002) who stated that 'in the highly competitive area of e-business any cross cultural miscommunication in cyberspace may leave individuals or organisations cut off from one of the most important online markets in the world'. Cultural influence is therefore recognised as a key moderator of e-commerce adoption and is now the focus of researchers and practitioners who aim to understand its moderating effect on consumers' willingness to online shopping. Understanding such effects however is increasingly difficult due to globalisation and mass migration. Out of this complexity, the phenomenon of acculturation has emerged, which brings into view the possibility of change through adopting the host country's cultural behaviour. Thus it appears to be crucial to investigate whether online shopping customers who are encouraged to mingle and migrate from country to country can overcome their native culture determined requirements and adopt e-commerce strategy and if so assess how this change affects their perception of advantages and disadvantages deriving from e-commerce. This study therefore aims to explore the extent to which native

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culture (couture of the country in which consumers grew up and with which they identify themselves) and non-native culture (culture of the country of consumers' temporal residence) affect consumers' e-commerce adoption decision and the effect of those two cultures on consumers' perception of advantages and disadvantages deriving from online shopping. Findings are then compared and contrasted to conclude whether consumers changing cultural environment are able to overcome their culture determined behaviour and fully accept e-commerce strategy.

8.1 Introduction

Originally designed for data exchange, the Internet, transformed into the World Wide Web, became a point of interest for both businesses and customers (Ward and Lee 1999), generating all major purchasing activities ranging from information search to transactions (Shiua and Dawson 2004). Both businesses and customers have found the Internet to be a flexible, interactive and efficient medium of communication (Phau and Poon 2000). Since it is not limited in time and space, benefits are derived for both parties (Sprano and Zakak 2000), especially in terms of retail shopping (Brow et al. 2003). The Internet, therefore, gave from its first appearance an indispensable possibility to sell and purchase products or services electronically through so called e-commerce (Keeney 1999) which rapidly developed into a major economic activity between businesses and customers (Sprano and Zakak 2000).

Today e-commerce seems to play a major role in the world economy (Phan 2003) with purchase of goods and services online increasing continuously, along with profits from online shopping, as discussed by Chang. Yet these researchers emphasize also that e-commerce "hasn't reached the take-off point of the diffusion 'S' curve" (ibid). Therefore it is no surprise that businesses increasingly want to participate in this virtual form of trading as they look for competitive advantage that will allow outperformance of rivals. Consequently, through e-commerce, they seek to strengthen their position in the market and gain access to e-markets unrestricted by national borders (Phan 2003). In virtual markets, therefore, businesses see direct benefits for themselves that can be achieved not only now but also in the future.

According to research from nearly a decade ago (Golsmith and Goldsmith 2002) e-commerce had even then become one of the essential characteristics of the Internet era which had begun to change traditional approaches to marketing mix, resulting in the popularization of online shopping. This seems to have direct relation to a number of advantages of online shopping for businesses but most importantly, for customers (Golsmith and Goldsmith 2002).

It is evident however that not all businesses can benefit equally from this rapidly expanding technology as customer motivation to shop online depends on cultural

determinants which seem to play a crucial role in technology acceptance (Mahmood et al. 2004). Thus it appears to be obvious that before the business can benefit from e-commerce it must know and understand the culture of the target market. This seems to be a challenge for businesses in general, as cultural misunderstandings can cause a failure of the e-commerce strategy (Lynch and Beck 2001). The challenge seems to be increasingly complex to overcome, since nowadays businesses are faced with the phenomenon globalization and mass migration. This study therefore seeks answers to three questions: (1) Are online shoppers subject to an effect of acculturation processes? (2) Can customers change their attitudes towards e-commerce when changing their cultural environment? (3) Can consumers change their perception of advantages and disadvantaged deriving from e-commerce when changing cultural environment and culture they are subject to?

In order to address this research objectives, the exploratory study is conducted on a carefully selected sample population of consumers who have changed their cultural environment. On the basis of data collected, the effect of both native and non-native cultures on consumers' perception of advantages and disadvantages deriving from e-commerce is examined as well as the effect of both cultures on consumer's intention to adopt e-commerce is assessed. Results being compared and contrasted are expected to reveal whether online shopping consumers are able to overcome the native-cultural requirements while changing cultural environment and if so what is the impact of such a change on their perception of advantages and disadvantages deriving from online shopping and their intention to adopt e-commerce technology.

The study is organized as follows. Section 8.2 outlines advantages and disadvantages of online shopping. It presents factors potentially influencing the willingness of customers to shop online, since culture appears to be a strong moderator of e-commerce acceptance rather than any economic or demographic factor. Keeping in mind throughout the cultural effects on online shopping adoption the phenomenon of acculturation is discussed. Section 8.3 presents research methodology which is followed by the data analysis. Finally, Sect. 8.4 presents research findings and their implications for both theory and practice.

8.2 Online Shopping Advantages Versus Disadvantages

The most important advantage of e-commerce recognized in the literature is the ability to satisfy customer's needs more effectively and efficiently than traditional shopping (Miyazaki and Fernandez 2006). Researchers (ibid) noticed that online shopping customers can look for the product with minimal effort, inconvenience and time investment. This minimized effort appears to be the main reason why customers use the Internet for the purchase of products (Brow et al. 2003). Moreover, it was found (ibid) that consumers can efficiently access and obtain a greater amount of detailed information about firms, products and brands reducing at the same time the cost and effort of information gathering (Oxley and Yeung 2001). Additionally, this access to information allows customers to compare product

features, availability and prices (Hart et al. 2000), providing a level of anonymity (Ward and Lee 1999). Furthermore, Rohma and Swaminathan (2004) found that this information is increasingly targeted to the specific needs of the customer and thereby increases decision-making competency for making purchases.

Information gathering for online shopping can be done with a minimum time investment. Following on therefore from the first more general advantage, the second most important benefit for potential online customers, according to Monsuwe et al. (2004) seems to be time saving while looking for and finding products. Since customers perceive as too high this time investment in traditional shopping, the 'time poverty' of Internet shopping therefore additionally encourages customers to shop online, where they can choose a time convenient to them, unlimited by store opening hours or physical location of relevant shops (Shiua and Dawson 2004).

The Internet gives shoppers the opportunity to order products 24 hours a day 7 days a week, and to have them delivered directly to their address (Augustyniak 2002). Therefore the psychological costs of having to physically go shopping are also reduced (Jayawardhena and Wright 2009). Furthermore, the customer achieves within a relatively short time, a number of additional benefits including a virtually unlimited variety of products, an original service and personal attention (Zhou et al. 2007). All this makes shopping more enjoyable, exciting and attractive (Jayawardhena and Wright 2009), creating the perception that shopping via the Internet is an easy and convenient way of obtaining a wide variety of goods (Zhou et al. 2007) at lower than traditional brick and mortar shop prices (Chodak 2008).

As can be seen from the above literature search, customers derive a range of benefits from online shopping. However, more recent research carried out by Soopramanien (2011) has found that customers not only realize the benefits of the new technology, but they also seem to be concerned about the risks involved in this form of buying activity. Therefore, risks associated with online shopping cannot be ignored (Sjöberg and Fromm 2002) as this seems to be a possible barrier preventing customers from full adoption of e-commerce and a possible obstacle to its development (Stankiewicz and Millo 2004b).

According to Sjöberg and Fromm (2002) 'people are of course not neglecting the benefits of new technologies' though they are aware that 'risks associated with new technologies are related to the expected benefits of the technology'. The customer, therefore, before adopting e-commerce fully as a shopping strategy, will also recognize risks associated with this form of buying activity as noted by Bauer (1960) who reports that consumers will usually choose to avoid risky choices or actions while making a purchase. The customer may aim to reduce risky options in a number of ways, by for example purchasing trusted brands or by purchase of so called 'generic' goods where the buying decision can be made on the basis of product description only (Turner and Callaghan 2006). Alternatively, customers might recognize risk to be too high and because of that they will choose traditional shopping rather than online shopping, finding that their needs are sufficiently satisfied through physical, conventional shopping. According to Stankiewicz and

Millo (2004a), such a decision proves that the perceived benefits of e-commerce may be outperformed by risk factors.

This continuous assessment of risk attached to online shopping seems to be directly linked to the biggest weakness of the Internet, which according to Phau and Poon (2000) is the fact that it can reproduce only two (sight and sound) of our five human senses, which means that the customer cannot feel or try on, smell, or taste products while shopping online. Therefore, even though some product characteristics can be easily illustrated or described on the website, other subjective information such as taste or flavour, texture or feel, are impossible to provide making it difficult for customers to judge for individual suitability or taste as well as product quality (Ward and Lee 1999) or to be able to physically examine and test the product (Soopramanien 2011). The outcome of the buying decision depends therefore on the behaviour of the retailer rather than on the customer control (Lee and Turban 2001). As a result, there is some uncertainty about the product features that are sellable on the Internet which according to Stankiewicz and Millo (2004b) is the main reason discouraging customers from shopping online. This seems to be confirmed by Phau and Poon (2000) who over a decade ago identified that products having so called 'an intangible value proposition' are more likely to be purchased via the Internet, as the customers do not have to judge its tangible features; therefore their risk perception is lower. Moreover, as it is well-established and as stated earlier, products that customers are already familiar with, or those which are relatively low cost, are also likely to be purchased online because the customer can reduce uncertainty and therefore risk while making buying decisions (Turner and Callaghan 2006).

The second limitation for Internet shopping that also seems to directly affect purchasing of goods online is the interpersonal nature of the transaction process (Stankiewicz and Millo 2004a). Anonymity, therefore, which earlier Ward and Lee (1999) recognized as an advantage, can be for some customers a serious limitation. This seems to confirm the findings of Stankiewicz and Millo (2004a) according to which the lack of face-to-face contact with sales personnel forces the customers to share personal information in an anonymous environment which they are neither confident nor comfortable with. Additionally, without assistance and direct interaction with sales staff, the customer has to be more independent and self-sufficient which seems to increase level of uncertainty (ibid).

A third discouragement to shopping online concerns the findings of Włodarczyk-Śpiewak, who discovered that the Internet while giving freedom to view, to create and edit information, may decrease traditional forms of "gatekeeper" certainty. This risk factor is also discussed by Flanagin and Metzger (2007). It involves the large amount of product information which increases not only choice, but indecision based on unwillingness to accept the product on the basis of what they read or see online as pointed out by Oxley and Yeung (2001) as well as Hart et al. (2000). Hence as these researchers say, two main advantages of online shopping- rich product choice and information may become a great challenge to customers to overcome (Huang 2003) as they may question the objective source and quality of product information or find it biased (Clewley et al. 2009).

All the above factors lead to greater uncertainty through increasing perceived risk of e-commerce strategy, producing a significantly negative influence on customers' attitudes towards online shopping. However apart from uncertainty that derives from lack of direct contact with the product and sales personnel, the concept of risk in online shopping refers overwhelmingly to the number of dimensions including infringement of privacy and system security involving financial transaction and personal information (Gibbs et al. 2002). This seems to be confirmed by Hart et al. (2000) as well as Turner and Callaghan (2006), according to whom a lack of security in payment methods is continuing to block e-commerce from full development. It is not surprising therefore that lack of transactional security is a high priority reason preventing customers from online shopping. According to Rymsza (2004) there is a common perception among customers that shopping online involves risk. More specifically Turner and Callaghan (2006) investigated that 'card fraud is approximately double the rate online that it is offline'.

From the above literature review it seems to be obvious that a number of advantages are derived from online shopping to both businesses and customers. At the same time however, it also involves risk and the perception of risk, which customers will consider before making purchase decision. Identified advantages and disadvantages are summarised in Table 8.1.

Keeping in mind both advantages and disadvantages deriving from e-commerce and their impact on consumer' intention to adopt e-commerce businesses have to face a challenge and try to reduce disadvantages associated with online shopping, by taking steps to reduce risk while emphasizing the benefits of online shopping. To help businesses meet these challenges, researchers developed a number of frameworks that aim to guide e-businesses in reducing disadvantages associated with online shopping. The suggested approach and direction appear to be effective as current research from Doherty and Ellis-Chadwick recognizes that "online shopping is moving rapidly from a minority hobby, to an everyday part of most peoples' lives". However, even though current estimates showing that the market share of online retailing aims to continue to grow not all businesses seem to benefit equally form e-commerce strategy, since research has shown that a significant discrepancy exists across countries in relation to the adoption of online shopping. This seems to be caused by the fact that globally, fewer people than expected actually purchase through the Internet. Some customers use e-commerce website to obtain information about the product or compare prices but not for the purchasing transaction. Those customers seem to use the Internet for research in the early part of the decision making process, subsequently finalizing transaction in the traditional physical retail store environment (Hart et al. 2000).

In order to investigate the reasons or motivations behind such behaviour, several research projects were undertaken mainly focusing on the importance of demographics and lifestyle characteristics (Mahmood et al. 2004) such as age, educated, economic status (Donthu and Garcia 1999) as well as prior experience with the Internet (Soopramanien 2011; Kamarulzaman 2007; Krzak 2009). The research findings however were varied. On the one hand, researchers stress the positive role of experience as well as familiarity with the Internet. On the other

Table 8.1 Online shopping: advantages versus disadvantages

Online shopping	
Advantages	Disadvantages
Effortless purchase of products (minimum effort) (Brow et al. 2003)	Product features uncertainty (Stankiewicz and Millo 2004a)
Minimum time investment (Monsuwe et al. 2004)	Lack of consumer control over purchase (Lee and Turban 2001)
Convenience (opportunity to order product 24 h a day 7 days a week (Augustyniak 2002)	Interpersonal nature of the transaction process (Stankiewicz and Millo 2004a)
Reduction of psychological cost of shopping (Jayawardhena and Wright 2009)	Lack of subjective product information (Ward and Lee 1999)
Access to wide variety of products (Zhou et al. 2007)	Uncertainty of source and quality of product information (Clewley et al. 2009)
Greater amount of detailed information (Oxley and Yeung 2001)	Personal information system security (Turner and Callaghan 2006)
Comparison of product features, availability and prices (Hart et al. 2000)	Lack of assistance and direct interaction with sales staff (Stankiewicz and Millo 2004)
Lower price (Chodak 2008)	Financial transaction system security (Gibbs et al. 2002)

hand, they indicate that Internet penetration growth, and therefore customer familiarity with the Internet, negatively affects the adoption of e-shopping strategies. Thus, it may be useful to obtain a third approach according to which 'the Internet penetration growth in most countries did not justify the adoption of e-shopping strategies' (Ernst and Young 2000).

The question of reasons for discrepancy in online shopping adoption across countries has not been comprehensively answered in the research literature surveyed so far. The reason for this may be due to the fact that a key role in e-commerce adoption may be found within the influence of cultural rather than economic or demographic factors (Krzak 2009). With this additional dimension in mind, research should focus on the national cultural characteristics which appear to shape customers' buying behaviour. According to Zak and Lim et al. (2004) in the global marketplace culture plays a crucial role in defining the willingness of customers to shop online. Culture seems to play an important role because through their culture people learn many patterns of thought, value and belief, as well as social behaviour patterns.

National culture is defined as 'the values, beliefs and assumptions learned in early childhood that distinguish one group of people from another' (Newman and Nollen 1996). Moreover as stressed by Chau et al. (2002) people learn 'potential acting from living within a defined social environment, normally typified by country'. Keeping those definitions in mind Chau et al. (2002) indicates that culture represents 'mental programming' which is determined by values of the local community and which in turn affects buyers' behaviour. Moreover Manstead adds that cultural variations have significant impact on the way people view the world which eventually affects behaviour. Therefore it seems to be obvious that

knowing and understanding cultural context is crucial for the business as different cultural backgrounds will respond differently to e-commerce strategy as culture greatly influences the way consumers behave.

In order to investigate cultural differences scholars have developed a number of frameworks. Hofstede's cultural framework is one of the most popular as it distinguishes cross-cultural differences. His model is constructed upon four dimensions: Individualism versus Collectivism, Uncertainty Avoidance, Power Distance and Masculinity vesus Femininity on the basis of which one culture can be distinguished from another. According to researchers (Lim et al. 2004) two dimensions, Individualism versus Collectivism and Uncertainty Avoidance directly affect customers' willingness to shop online. This seems to be caused by the fact that these two dimensions directly influence trust and willingness to take risk, with acceptance of uncertainty that derives from online shopping (Dawar et al. 1996; Jarvenpaa et al. 1999; Karvonen et al. 2000; Doran 2002; Ha et al. 2010).

Jarvenpaa et al. (1999) noticed that the Individualism versus Collectivism dimension also affects customer trust and therefore risk perception. This research expressed the view that consumers in different cultures might have conflicting perception of trustworthiness and therefore different perception of negative consequences of online shopping. The research confirmed this assumption as they recognized that consumers coming from individualistic countries have a higher trust in general and are more willing to base their trust in the retailer than consumers from collectivistic countries.

As can be observed from the above research there are significant differences between individualistic and collectivistic cultures, which differ according to the assessment of risk related to e-commerce. It can be assumed therefore that cultural differences assessed on the basis of individualism versus collectivism dimension are the reason of discrepancy of online shopping adoption across cultures. This seems to be confirmed by Karvonen et al. (2000) who proved that customers from countries of high uncertainty avoidance index will be likely to reject online shopping preferring traditional brick and mortar stores.

According to Karvonen et al. (2000) customers that come from low index of uncertainty avoidance cultures have greater flexibility and faster reaction to new situations, whereas the high level of uncertainty cultures require greater predictability of actions followed by prior planning. Research found also that customers (Finnish and Swedish) even though they may have had prior positive experience in shopping via the Internet still prefer to buy in traditional shops, since as the research revealed, the possibility to touch the product while buying goods in a traditional shop was found to be of high importance in those countries and cultural influences. Moreover those customers wanted more information about the products as they found that there was not enough information available or easily accessible in the website. On the basis of research run by Karvonen et al. (2000), therefore, it can be assumed that customers from countries of high index of uncertainty avoidance will be more likely to reject advantages deriving from e-commerce.

This seems to be directly caused by the fact that customers from high uncertainty avoidance cultures require structured rules and regulations; they have stronger faith in institutions and lower tolerance for abstraction (Doney et al. 1998), which seems to be increased by their higher resistance to change (Lim et al. 2004).

On the basis of the above research there is no doubt that national culture plays a crucial role in e-commerce strategy adoption. This 'mental programming' seems to direct customers to specific behaviour for assessing adoption or rejection of online shopping as it directly evaluates risk associated with this form of buying activity. All this research makes clear therefore that before the business can take advantage of benefits deriving from e-commerce it must know and understand the culture of the target market (Mahmood et al. 2004). This seems to be a challenge as cultural misunderstandings can cause a failure of the e-businesses strategy. However the challenge of understanding cultural context seems to be increasingly complex as businesses in the global market have to face the phenomenon of acculturation facilitated by globalisation and mass migration.

Acculturation defined as 'the process of learning and adopting cultural traits, different from the ones with which the person was originally reared'. It can be effected by a number of factors such as language or customs of the country culture where an individual currently resides. This seems to confirm Lee's research (1993) which found evidence that "there are three fundamental elements in the process of acculturation, namely culture, contact, and change". The process of acculturation therefore involves culture adoption of current occupation country.

Understanding the process of acculturation seems to be important in order to meet challenges derived from globalization which encourage customers to mingle and migrate from country to country. Some researchers Ward and Kennedy, Evenson et al. (2004), focused on the acculturation process but their research was based on customer attitudes to traditional shopping, ignoring at the same time online shopping. Karvonen et al. (2000) in his research on customer attitudes towards online shopping while recognizing global access of the Internet pointed out that the process of acculturation may occur. He believed that 'when customers switch places, a cultural shock would be more than likely' and because of that customer will experience stress while accommodating to the website created for another culture. He also emphasized that e-business 'should be wise enough not to shock their multi-cultural users away by ignoring their cultural predetermines but should rather conform their service to serve users from all nationalities and cultures as well as possible'.

Hence, it looks like Karvonen et al. (2000) seem to disregard the fact that nowadays many customers are subject to 'cultural shock' as work or education migration become common. Thus businesses that want to take advantage of e-commerce strategy have to deal with the process of acculturation as customers physically are moving from one country, and culture, to another and realise the impact of this 'cultural shock' on consumers' perception of advantages and disadvantages deriving from e-commerce as well its impact on consumers' intention to accept e-commerce as their main shopping channel.

8.3 Research Methodology

In order to address the objectives of this research the exploratory study is carried out on a sample of Polish consumers currently residing in the UK. It is believed that this group has sufficient knowledge and/or experience to satisfy the study objectives, for the following reasons:

(1) Polish culture and British culture represent two opposite directions in terms of Hofstede's individualism versus collectivism dimension and uncertainty avoidance index. Polish culture is characterised as collectivistic and on a high uncertainty avoidance index. In contrast, British culture is highly individualistic characterised by a low index of uncertainty avoidance (see Graph 8.1). It can be assumed therefore that consumers subject to influences of Polish culture will be less likely than consumers subject to influences of British culture to realise advantages of e-commerce and thus accept e-commerce as their main shopping channels.
(2) Significant discrepancy in terms of e-commerce sales exists between Poland and the UK, confirming the effect of culture discussed above (see the Graph 8.2)
(3) Polish nationals are one of the largest minority groups residing in the UK; thus a sample size sufficient to address the research objectives is guaranteed.

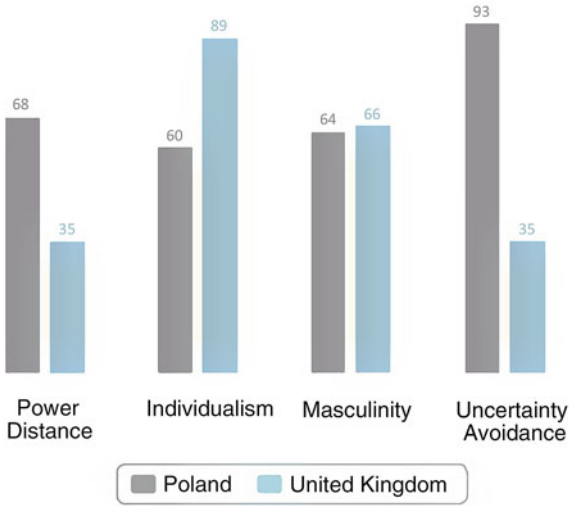
The exploratory study is based on an in-depth qualitative investigation during which informants were asked to compare and contrast their perception of advantages and disadvantages deriving from e-commerce as well as their intention to adopt it as their main shopping platform from two cultural perspectives: Poland and the UK.

Informants were recruited during face-to-face meetings taking place at ethnic cultural events, or through fliers posted in ethnic shops and online forums set up for Polish immigrants residing in the UK. Recruited informants were asked to recommend potential future informants. This way 25 informants were recruited to take part in this study.

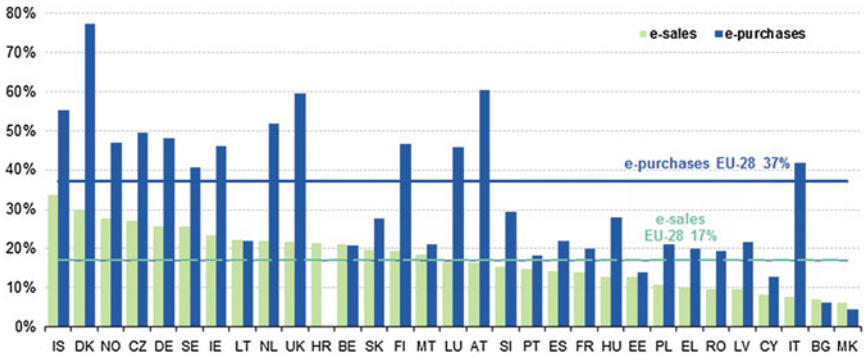
Each interview lasted a minimum of 40 min. All informants were interviewed in their native language in order to reduce any fear factor and establish trust between researcher and informants. All interviews were recorded and transcribed. Transcribed data was later translated before content analysis was carried out.

8.3.1 Sample Assessment

In total 25 informants agreed to take part in the study, composed of 13 male and 12 female. All informants confirmed that they grew up in Poland and identified themselves as Polish. Informants revealed that they had come to the UK after 2004, when Poland joined the EU, in search of economic opportunities. All interviewed



Graph 8.1 Hofstede's cultural dimensions: Poland and the UK (www.geert-hofstede.com)



Graph 8.2 E-commerce sale and purchase (www.Eurostat.com)

informants confirmed that they maintain Polish culture while living in the UK e.g. they celebrate holidays related to Polish culture. They also seems to have strong relationships with compatriots residing both in Poland and in the UK. At the same time they revealed that they did not adopt British culture and its customs. They also confessed that their interaction with British nationals is rather limited.

8.3.2 Advantages Versus Disadvantages of E-commerce

From the data collected it is clear that informants realise advantages deriving from e-commerce both in Poland and in the UK. Those advantages however differ in accordance with the cultural perspective they are assessed from.

According to the interviewed informants the biggest advantage of e-commerce in the UK is convenience. Informants claim that they are encouraged to adopt e-commerce because they find this form of shopping convenient especially when they suffer from 'time poverty' and lack of facilities (e.g. car) to shop in traditional shops.

Kazimierz (…) I do not have to leave my house. I do not waste my time. I order this and that. It is delivered. Someone knocks my door. I pay. Here you are- thank you. Yes, I would do it. Zosia: Sometimes. When I do it, it's mostly because it's more comfortable for me. Without a car it's much easier that way. I don't have to carry all these bags and I can save my time.

Piotr: My sister says that if I have free Saturday or Sunday then we can go shopping. But I don't have a car so if it's raining then it (traditional shopping) *is a big inconvenience.*

Piort B: It's a very helpful because you don't have to go outside, you don't have to stay in a line too and you don't have to carry all those bags. The other thing is that when you don't have a car and you want to go to Asda or Tesco you have to take a bus, you don't have to carry all those heavy bags. One day we checked and it came out that the round-trip by bus costs £8 and for the store delivery you will pay not more than £5. So advantages only.

Edyta: It saves my time. It is difficult with baby. (…) When I find what I want to have I do not have to go from one shop to the another and look for it God knows where. It is more convenient.

In additional to convenience deriving from e-commerce informants seem to also realise that while shopping online they may purchase products at lower price than in traditional environment. The possibility to purchase products cheaper seems to additionally encourage consumers to shop online in the UK.

Max: (…) First of all it is cheaper (…) you can save up to 75 %.

Despite the perceived convenience of e-commerce, informants seem to realise there are disadvantages to this form of shopping in the UK, among which the most important appears to be lack of the possibility to physically examine the product. Consequently, informants seems to carefully select products they purchase online. They reveal that they are likely to buy electronic devices as they base the purchase decision on parameters, which according to informants will not differ from one product to another.

Piort K: (…) for example an electronic device is not a vegetable that you need to check before buying, because one can be better than the other one, or one is smaller and the other is bigger. An electronic device has parameters that can be checked in a table and then find the most attractive offer.

They also seem to shop for clothing even though some informants revealed that they still want to try those product on before purchase thus they prefer to shop for clothing in a traditional shops rather than online.

Sylwia: (…) Grocery shopping no, but something like clothes or cosmetics yes, Not really clothes because I am that kind of person that cannot but clothes online, I have to try it on. But a bag for example, or hair cosmetics, face cosmetics. I use it, or some sort of equipment.

This suggests that indeed lack of possibility to touch the product and examine it before purchase may be a major disadvantage preventing consumers from accepting e-commerce. It is confirmed by informants discussing the possibility of doing grocery shopping online. They emphasize that they have to examine the grocery products before purchase as they do not trust online retailers to deliver high quality products.

Krzysztof: I do (online shopping) *apart from grocery shopping (…) Because when I see a tomato I like to touch it and see if it is something I would like to eat. You can see it on a picture but you can have a 'ketchup' delivered.*

Piort B: There is such a minus that a driver comes and you know that somebody crossed the store to find your products so you may receive a rotten cucumber. You know, that you wouldn't take such a product but somebody did it for you. It's a minus because you see it at a first glance or you bought a product with an expiry date till the end of the week and probably you would search for a longer one.

It is noticeable however that this perception changes in relation to time limitation as well as lack of facilities to do shopping in a traditional environment forces consumers to take the risk and shop online. It is also obvious that once informants have shopped online they seem convinced about the benefits of e-commerce and value its advantages more than disadvantages and thus they shop online for a wider range of products including grocery products.

Piotr B: If there was a situation when I logged on that page, I ordered some products and I didn't receive what I ordered and instead of that I had products with short expiry date, 5 things are missing or things like that. Then I don't know would I do it again. I suspect that we would go to the store. But if they charge your account with a proper price, they bring everything what they should and they inform you that you will receive your shopping between 3 p.m and 4 p.m and a driver comes at 3.20 p.m. Everything is arranged and you received all products you wanted, well… Then I tell you why even bother to go out. This is a huge

advantage. If they would say now that all those shops like Asda or Tesco resign from this type of shopping it would be much harder.

Max: I buy everything, to begin with clothes, electronics, cosmetics. Everything.

Igor: Starting from electronic equipment, clothes, lots of things. I cannot choose one particular category, because it is a very wide range, almost everything.

From the perspective of Poland however it is not convenience (or time limitation) that encourages consumers to shop online, as according to informants they had more time to do shopping there than they have in the UK, but the possibility to access products that are not available in traditional shops is the biggest advantage of online shopping.

Basia: I like to do needlework and similar stuff. So when I wanted to buy products for my needlework I bought them online, as they were not available in regular shops. But when shopping for food, basic everyday stuff, electronics then no.

Weronika: You can get a books on Amazon or on any other website that you cannot get in a bookshop. We are looking for a book which we cannot get. We went to all bookshops in Poland and we could not find it, it was online on Ebay.

It can be assumed therefore that in Poland where consumers believe they have more free time they prefer to shop in traditional brick-and-mortar shops and they choose to make purchases online only if they cannot access the product they require in a traditional environment.

At the same time they use e-commerce websites to compare products. They believe that the possibility to compare prices of individual products is an advantage of online shopping, but subsequently they might actually buy the goods in a traditional environment.

Zosia: People can compare prices, it's good especially for those who live in a small town and villages. I didn't have any access to large shopping centres so it's a huge short cut to my mind.

Marcin: (…) *when I wanted to buy a computer I compared prices on Allegro. And in this way I found my laptop. And the offer was attractive, and the price was very attractive.*

While comparing and contrasting consumers' perceptions of the advantages and disadvantages they can derive from e-commerce it seem to be obvious that these perceptions are culture dependent. According to the data it seems clear that consumers decide to adopt e-commerce or reject it in accordance with the time perception. In essence, when consumers believe that they have limited time to do shopping they will be more likely to adopt e-commerce than consumers who believe that they have more time to spare for shopping. This time perception in turn may be directly associated with culture and in particular with individualism

versus collectivism dimension. It is believed that in individualistic cultures preference is shown for a loosely-knit social framework in which individuals are expected to be more independent, responsible for taking care of themselves. Consequently, consumers espoused to values of individualistic cultures will be more concerned about their own wellbeing and thus will tend to value time-saving and convenience deriving from e-commerce. In contrast, collectivistic cultures show preference for a tightly-knit framework in society; thus they value social interaction also as an element of shopping. Consequently consumers espoused to values of collectivistic culture (i.e. in Poland) prefer to shop in traditional shops and during this activity interact with their peers and turn to online shopping only if they have no other choice to access the product.

From the comparison it is apparent that these consumers are able to overcome their national or cultural characteristics, as once they change their cultural environment they seem to value convenience deriving from online shopping more than any possible social interaction taking place during traditional shopping. This is also true in relation to risk perception which is assessed on the basis of uncertainty avoidance index. Informants confirm that indeed they consider shopping in an online environment to be a risky activity but as they say, they tend to take this risk as they seem to value convenience more highly than they perceive any possible risk associated with e-commerce.

8.4 Conclusion

This study was set out to address three questions: (1) Are online shoppers subject to an effect from acculturation processes? (2) Can customers change their attitudes towards e-commerce when changing their cultural environment? (3) Can consumers change their perception of advantages and disadvantaged deriving from e-commerce when changing cultural environment and the culture they are subject to?

On the basis of the exploratory study there is evidence that online consumers are subject to some acculturation process because they are likely to change their culture-determined attitudes towards e-commerce once they change cultural environment, for example by moving to reside in another country. This results in change of consumer perception regarding advantages and disadvantages deriving from online shopping.

It is apparent that in highly collectivistic cultures characterised by a high index of uncertainty avoidance, consumers tend to turn towards online shopping only if they cannot purchase the product in a traditional environment. In opposite circumstances, being espoused to values of collectivistic culture, they seem to value convenience more than social interaction and thus appear more likely to adopt e-commerce as their main shopping channel.

The findings of this study seem to have direct implications for theory and practice. First, they reveal that culture determined attitudes towards e-commerce tend not to be static but open to change once a consumer changes cultural values which s/he is espoused to. Second, it was found to be the convenience factor that encourages consumers to shop online for the main reason—according to Daniel one of the informants—that '*People aspire to do as little as possible. And online shopping favours this attitude'*.

Consequently, on the basis of these findings, it seems to be obvious that businesses can enter and benefit from global and thus intercultural e-commerce because consumers are able to change their culture-determined attitudes towards e-commerce. Such a change however requires that the emphasis for change is on convenience in the use of e-commerce. At the same time businesses should try to replicate conditions which produce some perception of social interaction on a digital platform. This can be achieved through introduction of online forums and/or chats where consumers can spend their free time socially interacting with their peers. It is suggested therefore that a shopping platform which is both convenient and provides consumers with the opportunity for social interaction will encourage consumers to shop more readily online, reducing risk perception. The lower the risk perception in turn will reduce disproportion in terms of e-commerce sales across countries and will allow businesses to fully benefit from access to the global and thus the intercultural e-commerce marketplace.

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Chapter 9
HCI and Usability Principles and Guidelines in the Website Development Process: An International Perspective

Tomayess Issa and Pedro Isaias

Abstract This chapter provides an answer to the question "Do industry practitioners consider that human computer interaction (HCI) and usability principles and guidelines are essential in the website development process?" The answer was sought by means of an online survey (N = 126), of Information Systems(IS)/ Information Technology (IT) personnel in Australia and Portugal, that allowed the collection of both quantitative and qualitative data. Explanatory analysis was conducted using descriptive statistics, including frequencies and an independent sample T-test. The study findings suggest that both HCI and Usability were significant aspects of the website development process especially in the marketing websites, as their inclusion will encourage users to revisit these websites and thereby increase businesses' profits. Usability and HCI features are especially important in the design stage to improve the structure and functionality of a website. The conclusions drawn in this chapter will assist IS/IT industry practitioners in Australia and Portugal to implement HCI and usability approaches by means of a New Participative Methodology for Marketing Websites (NPMMW).

9.1 Introduction

Computer technology and the Internet are essential tools in the 21st century, since businesses and individuals have come to depend increasingly on these technologies compared with the traditional systems used to achieve the same ends. The

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current technology is capable of assisting businesses and individuals to complete their tasks far more efficiently. Not only is there a proliferation of stand-alone computers; networking on a global scale has increased enormously as a result of the Internet, World Wide Web, Social Networks, Mobile Systems, Intelligent Environments and other technologies.

The increase of ICT usage all over the world has presented a new challenge to HCI researchers to meet the needs of businesses and individuals, and to ensure that the new ICT technologies are more effective and efficient for both current and future applications, including websites. Therefore, HCI researchers should assist in creating and developing interfaces and technologies, including websites, which are more effective and efficient, and should study the "social and communal aspects of technology use and effective and aesthetic aspects of design" (Sengers et al. 2006, 2009, p. 1683). To achieve this, HCI researchers must consider the different perspectives of users and designers in order to understand their notions of design, attitudes, ethnography and user empathy, and seek to develop new interfaces and technologies, including websites, that match the goals of current and future generations and the needs of their community. However, as a recent study by Lee and Kozar (2012) posits, websites still contain a number of usability problems, such as their being difficult to understand, having inconsistent format, being difficult to navigate, providing little interaction, and being unreliable.

In order for these potential problems to be addressed during the website development process, this chapter examines whether the industry practitioners consider HCI and usability principles and guidelines to be essential in the web development process, especially in Australia and Portugal, and how these can be incorporated into the design methodology. This chapter will also make a valuable methodological, theoretical and practical contribution to the current literature on HCI and usability issues arising from the website development process by discussing the NPMMW, for the web development process and adding new description, tools and techniques for HCI and usability, which are required during the web development process. This chapter is organized as follows: Human Computer Interaction and usability background; research methodology and questions; participants; results; discussion, significance and contribution of the study both theoretical and practical; conclusion and further research directions.

9.2 Human Computer Interaction

HCI "is a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them" (Preece et al. 1994, p. 7; Preece et al. 2002; Sharp et al. 2011). HCI is now "concerned with understanding, designing for, and evaluating a wider range of user experience aspects" (Sharp et al. 2011, p. 18). Therefore, the reason for studying HCI in the development process is to create interactive computer systems that are usable as well as practical (Head 1999) in the

context of the wide range of current computer applications, including the World Wide Web (WWW). The term 'HCI' relates to several stages in the development process, including the design, implementation and evaluation of interactive systems, in the "context of the user's task and work" (Dix et al. 2004, p. 4). The implementation of HCI requires a vast range of skills, including an understanding of the potential users, their tasks, environments (Vora 1998), software engineering capabilities, and graphical interface.

The main purpose of using HCI in the design process is to develop an efficient and effective user interface to suit the needs and requirements of the users. To achieve these aims, HCI researchers need to involve the users in the design process by integrating different kinds of knowledge and expertise and making the design process iterative via effective usability evaluation (Farzan and Brusilovsky 2011; Subramanyam et al. 2010). This process allows for feedback regarding the negative and positive aspects of prototypes and ensures that the interface/website matches users' needs. It is important that the way in which users interact with computers be intuitive and clear. However, the designing of appropriate HCI is not always straightforward, as the many poorly designed computer systems testify. One of the challenges of HCI design is to keep abreast of technological developments and to ensure that these are harnessed for maximum human benefit.

The goals of HCI can be summarized as safety, utility, effectiveness, efficiency, and appeal. These goals focus on the services that the system provides, how quickly the tasks can be achieved, and ensuring that users appreciate the system. Haklay (2010, p. 5) indicates that HCI aims to create systems which provide functionality to meet the needs of businesses and individuals. Bodker (2006) (cited in (Maceli and Atwood 2011)) describes the three waves of HCI roles: humans as factors, actors and crafters. Humans interacting with computers should now be considered as crafters which cannot only control, design, and develop the relationship between themselves and technology, but also understand the functionality behind this technology. Consequently, all information interfaces, including websites, should be designed to enable users to apply their skills to ensure the efficiency and effectiveness of interaction, thereby making them more enjoyable for users.

Finally, recent studies (Kanis 2011; Te'eni et al. 2007) have indicated that HCI has been focused on effectiveness, efficiency, satisfaction and great usability; however, currently, the aims have shifted to understanding and supporting human beings and their interaction with and through technology.

9.3 Usability

Usability refers to the "extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use" (Joshi et al. 2010, p. 2047). It involves the "quality of the interaction in terms of parameters such as time taken to perform tasks, number of

errors made and the time to become a competent user" (Benyon et al. 2005, p. 52; Lavie et al. 2011; Sharp et al. 2011). Usability can also be thought of as "a quality attribute that assesses how easy user interfaces are to use. The word 'usability' also refers to methods for improving ease-of-use during the design process" (Nielsen 2003). Shackel (2009, p. 340) indicates that usability of an interface is the "capability in human functional terms to be used easily and effectively by the specified range of users, given specified training and user support, to fulfil the specified range of tasks, within the specified range of environmental scenarios." Usability is the "extent to which a system with given functionality can be used efficiently, effectively, and satisfactorily by specified users to achieve specified goals in a specified context of use" (Te'eni et al. 2007, p. 2–3).Usability "has been shown to be a key factor when the services of an organization use the Internet" (Flavian et al. 2006, p. 2). Several studies (Hornbaek 2006; Lee and Koubek 2010; Mankelow 2006, p. 53; Shackel 2009) corroborate that contention, stating that good usability will provide several advantages to a business by "increasing sales, reducing costs and boosting labour productivity; staff takes less time to train, are more productive and make fewer mistakes." Furthermore, usability adoption in the web development process will reduce the cost of development, maintenance and support, and users will have a more satisfying experience when dealing with the interface/website (Følstad et al. 2010; Nicolson et al. 2011). Flavian et al. (2006, p. 2) declared that "website usability is a very important part of the store's image and (that) it can influence shopping behaviour in a similar way to those aspects of traditional establishments."

To develop a successful website/interface with good usability, HCI researchers need to understand the organizational, social and psychological factors that determine how people operate and make use of computer technology effectively. HCI researchers also need to develop tools and techniques to help designers ensure that computer systems are suitable for the activities for which people will use them, and achieve efficient, effective and safe interaction in terms of both individual HCI and group interaction. These factors should be considered very carefully at the design stage, as most of the users should not have to change radically to 'fit in with' the system; rather, the system should be designed to meet their requirements. Furthermore, Sharp et al. (2011) indicate that usability goals should be considered by designers and HCI researchers to ensure that the user interface is easy to learn, effective and efficient to use, and easy to remember, and has fewer errors and good utility. These goals should be considered during the design of an interactive website/interface in order to enhance its usability. Therefore, these principles and guidelines are intended to give more assistance and knowledge to designers regarding system design.

HCI researchers must observe and carry out interactions and discussions with various types of users in order to acquire a comprehensive picture of what is required of the website/interface so as to match users' needs (Harbich and Hassenzahl 2011; Nies and Pelayo 2010). Hence, HCI and usability are essential factors to consider when designing and developing a user interface which is more efficient and effective and produces user satisfaction rather than frustration.

In order for the interface to have these attributes, the potential users should participate in the design from the outset. Følstad et al. (2010), Nies and Pelayo (2010) and Issa et al. (2010) stipulate that user participation is essential in the web development process, and that users should be present during this process to share their perspective, from the initial planning stage through to the maintenance stages and procedures. User participation in the system development process will: prevent user frustration, thereby reducing the time taken in several stages, including evaluation, testing, implementation and training; ensure that the system is designed to match users 'requirements; and increase users' satisfaction with and acceptance of the website/interface. Finally, several studies (Barcellini et al. 2006; Darlington 2005; Shi 2011) indicate that an understanding of the users' needs is considered the single most important factor determining the success of a website.

9.4 The New Participative Methodology for Marketing Websites

It was found that existing website development methodologies were missing several key stages, with the result that users became frustrated and lacked loyalty to the website (Issa 1999, 2008). There is the great potential for combining aspects of methodologies from different disciplines; however, these need to be integrated in a coherent way. To address these problems, a new integrated methodology was developed by the first author during her PhD research. The NPMMW was created from basic concepts derived from: life cycle models; Information Systems development methodologies; methodologies with explicit human factor's aspects; website methodologies; marketing methodologies; and additional techniques such as task analysis and detailed website layout design and implementation (Issa 2008).

After studying the life cycle model, the first researcher identified four key principles which were the foundation of the research: user participation; iteration; usability; and "real interaction". These principles were designed to produce websites with high usability, thereby: involving the users in the design from the beginning; avoiding frustrations for the end-users (internal) and client-customer users (external); making the website more approachable, friendly and interesting; and winning the trust of the site visitors by meeting users' requirements. The four key principles can be described as follows (Issa 2008):

User participation: The main purpose is to allow user participation in the website development process in order to gain more information about the problems, elicit alternative solutions from the users, and familiarize them with the website before it is released.

Usability: To confirm that the website design is efficient, effective, and safe, has utility, is easy to learn and easy to remember, is usable and practical, provides job satisfaction, and incorporates performance measures that effectively assess the users' requirements and requests.

Iteration: To allow for effectiveness and self-correction; this approach will assist the designers to build up the new website and ensure that the project will be tested repeatedly and improved until it meets users' requirements.

Real Interaction: The designer will track users' behaviour to present statistics and useful information to demonstrate what attracts or repels users. This can be achieved by adding one of two options to the website: (a) a feedback form to outline users' needs; alternatively, (b) a counter on a webpage, which will provide detailed statistics (log file) to the designer. Information obtained will include which "Web pages are viewed most often, which domains request Web pages, and what path's users follow as they navigate through a site" (Lazar 2006, p. 44). The way in which these four principles were incorporated (or not) in each current methodology was evaluated in order to choose the strongest stages for use in the new combined methodology. After reviewing and applying techniques for methodology integration, the first researcher produced the New Participative Methodology for Marketing Websites (NPMMW).

The major stages and steps of the NPMMW are: planning; analysis (task analysis); design (HCI; usability; navigation; prototyping); usability evaluation; functionality testing; user participation; iteration; implementation (construction, staff training, promotion); maintenance (real interaction and feedback; project review); and content management systems. The major stages of the methodology may be described as follows (Issa 2008):

1. **Usability Evaluation (SA1)**: This stage is located at the centre of the new methodology, since, before moving to another stage, it is necessary to evaluate the results from the previous stage, which is known as "formative evaluation".

   1.1 *Usability Evaluation—Measurement (SE1.1):* This step is an ongoing evaluation of the website to ensure it meets the website goals.

2. **Functionality Testing (SA2)**: This stage is also located at the centre of the new methodology (with the usability evaluation) to test the results from the previous stage before moving to another stage. Expert-based and user-based evaluations will test the website to ensure that it functions effectively from the technical perspective.
3. **Planning (SA3)**: This stage allows the designer and users to address various project-scoping issues such as the requirements for developing a website; the nature of the product; the buyers; the firm's competitors; the location of the site; and how to promote the website. In addition, this stage involves developing a detailed schedule of activities required in order to carry out the development of the website in an efficient and effective manner.
4. **Analysis (SA4)**: In this stage, users, analysts and designers are expanding their findings using adequate detail to illustrate exactly what will and will not be built into the website design, and to add, improve, and correct the initial website requirements if they are not meeting the users' desires.

4.1 *Analysis—Task Analysis* (*SE4.1*): This step will define the purpose of developing the website, the user type, the type of work users will do with the website, users' goals and their activities.

5. **Design (SA5)**: The design stage will utilize the requirement specification from the previous stage to define: (1) what the website is; (2) how the website will work; (3) user involvement in decision-making; (4) future users; and (5) usability requirements.

   5.1 *Design—Usability Goals* (*SE5.1*): This step will allow users (end-users and client-customer users), analysts, and designers (internal and external) to confirm that the website design is efficient, effective, safe, useful, easy to learn, easy to remember, easy to use and to evaluate, practical, and visible, and that it provides job satisfaction.
   5.2 *Design—HCI* (*SE5.2*): This step will allow users (end-users and client-customer users), analysts, and designers (internal and external) to identify that the website design is practical. There are many specific issues that need to be taken into consideration when designing website pages, such as text style, fonts, layout, graphics, and color.
   5.3 *Design—Navigation* (*SE5.3*): This step is taken to define the specific navigation paths through the website between the entities and to establish the communication between the interface and navigation in the hypermedia application.
   5.4 *Design—Prototyping* (*SE5.4*): This step is essential in the website design process as it allows users and management to interact with a prototype of the new website and to gain some experience in using it. This step will allow management to reduce costs and increase quality through early testing.

6. **Implementation (SA6)**: This stage involves the technical implementation of the website design. It will allow users to use the new product and to check whether it meets their requirements.

   6.1 *Implementation—Construction* (*SE6.1*): This step involves the technical implementation of the website design.
   6.2 *Implementation—Training Staff* (*SE6.2*): This step will give necessary training to the staff about the new website.
   6.3 *Implementation—Promotion* (*SE6.3*): This step will use various tools such as: press releases, link building and banner-ad campaigns, paid search engine, directory listing campaigns, and traditional marketing methods (i.e. Newspaper, Radio and TV) to promote the website.

7. **Maintenance (SA7)**: This stage is ongoing maintenance to the website including update of changes and the correction of errors in the website.

   7.1 *Maintenance—Real Interaction and Feedback Tools* (*SE7.1*): Under the maintenance stage, real interaction needs to be tracked by using the server log file. This information is very useful to the designers to improve and

enhance the structure and the functionality of the website to encourage more users to visit it. In addition, feedback tools should be available on the website to allow the users to be able to contact the website owner for information or personal communication and to provide feedback about the website. For example, forms, survey, discussion forum, contact form, telephone number, and a prize should be available on the website to encourage the users to provide feedback about the website. The researcher recommended that in order to prevent spam, the organization's e-mail address should not be made available on the website.

7.2 *Maintenance—Project Review* (*SE7.2*): This step should be available to ensure that the website is working within the project goals. This means that after putting the website online, the designers need to check the website after one week to evaluate if the website construction and structure are working according to the users' needs and requirements. One example of a tool that can be used for the project review is the checklist; i.e. a checklist for the goals and objectives, usability and technical requirements.

8. **User Participation (SA8)**: This aspect is a very important concept in the methodology, as the main purpose is to allow user participation in the website development process to gain more information about the problems and alternative solutions from the users and to familiarize them with the system before it is released. For each stage, there is a rating from 0 to 3 which indicates the extent of user participation in the development process.
9. **Iteration (SA9)**: Occurs between each stage and step in the New Participative Methodology for Marketing Websites to check that the website does indeed meet users' (end-user and client-customer) requirements and company objectives before moving to another stage.
10. **Content Management Systems** (**CMS**) (**SA10**): This aspect is relevant to the usability evaluation, functionality testing, planning, design, implementation, and maintenance stages New Participative Methodology for Marketing Websites. This tool will allow the users to manage the web contents by enabling them to add, edit, remove, and submit information by using various templates and workflows without needing any previous knowledge of the website editing tools.

Furthermore, the NPMMW is "contingent", meaning that it will allow the designers and users to choose the particular stages, steps, tools and techniques, which "suit the type of project, and its objectives, the organization and its environment, the users and the developers and the respective skills (Avison and Fitzgerald 2003, p. 82). This will provide flexibility to the users and designers to make it possible to adjust the version of the methodology to be used according to their needs.

Avison and Fitzgerald (2002, p. 9) stated that most "methodologies are designed for situations that follow a stated or unstated 'ideal type'. The methodology provides a step-by-step prescription for addressing this ideal type. However, situations are all different and there is no such thing as an 'ideal type' in reality." Therefore, a

contingency approach should be used since one of the intended benefits of making the new methodology contingent is to allow users and designers to select the techniques which meet the requirements of the website, since each website from the marketing perspective has different goals and objectives. To meet these objectives, the development of the website requires particular experience and skills.

For example, if one wants to develop an existing website, the users and designer can select the particular stages, steps and techniques which meet the project objectives. If the user requirements are already known, the users and designers need to use only that part of the methodology that covers the design to the maintenance stages. Another example of contingency is the development of a new website with limited functions which means that no "real interaction" and feedback tools need to be used. Therefore, the users and designers will use all the stages and steps except step (SE7.1) which incorporates the real interaction and feedback tools.

9.5 Research Question and Methodology

Of course, the application of HCI principles and guidelines and usability evaluation techniques to interaction design has been a 'given' within academic circles for decades. However, the question remains as to whether actual industry practitioners (and their businesses) support such notions and whether they have the knowledge and tools to implement them in everyday practice. This chapter aimed to investigate the question: "Do industry practitioners consider that human computer interaction (HCI) and usability principles and guidelines are essential in the website development process?" Further questions focus on evaluating how effectively such issues are addressed in real industry practice and the constraints that limit their application.

For this study, the first researcher developed a new online survey, based on the PhD results, which was distributed in Australia and Portugal. Information Systems (IS) and Information Technology (IT) professionals from both countries were surveyed to examine the importance of usability and HCI in the web development process. A formal letter was emailed to the respondents with the survey link, and all pages of the survey contained instructions at the top of the page and a progress bar along the bottom to provide feedback to users about their proximity to completion. Pages 1–10 presented the survey items with three questions per page to minimize scrolling and the concluding page thanked respondents for their participation. The survey was divided into seven parts, each of which discussed one key aspect of the research: user participation (nine questions); real interaction (five questions); HCI and usability (seven questions); iteration (three questions); the New Participative Methodology for Marketing Websites (integrated and contingent) (six questions); general questions (eight questions in relation to evaluation, testing, feedback, cost, low fidelity prototyping, project review and content management system); and background information.

The online survey approach was adopted since it provides various benefits compared with traditional modes: this tool can be accessed from anywhere and anytime; it is easy to manage, inexpensive, and practical; it has a high response rate; and it is quick to deliver the results. Another key reason for using the online survey was to reduce errors, since the results are captured as an Excel or SPSS spreadsheet, which makes it easier for the researcher to analyse the results (Cho et al. 2011; Fan and Yan 2010; Gordon and McNew 2008; Graefe et al. 2011; McBurney and White 2007; O'Brien and Toms 2010; Robinson and Martin 2010; Smyth et al. 2010).

Additionally, Dillman (2007, p. 354) indicates that online surveys can "provide a more dynamic interaction between respondent and questionnaire than can be achieved in e-mail or paper surveys". However, empirical studies (Harrison and Reilly 2011; Hesse-Biber 2010; Maudsley 2011; Molina-Azorin 2011; Wiggins 2011) indicated that using the online survey as a research tool comes with risks associated with technical failures, computer viruses and worms, and hacking and internet crimes, all of which can affect the online survey results.

A five-point Likert scale was used in each part of the survey to "examine how strongly the subject agrees or disagrees with statements" (Likert 1932; Sekaran 2003, p. 197). The five points on the scale are Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree. These levels of agreement were coded using 1–5 for the statistical analysis. Besides using the Likert five-point scale for this survey, the researchers provided a section where participants were invited to write down other comments regarding each part.

9.6 Participants

The 126 respondents from Australia and Portugal are from diverse field(s) of study: Information Systems (28, 45 %), Communications Technology (2, 18 %), Computer Science (9, 12 %), Multimedia (2, 6 %), and Graphics (7, 2 %), and other fields (51, 16 %) including various studies from technical communication, Interaction Design, Marketing and Education, learning sciences and technologies, marketing strategy, Sociology, management, quality and engineering, Medicine, Taxation, and Business Science correspondingly (see Table 9.1).

As for the respondents' highest education level, the highest were the Bachelor's degree (34.9, 40.4 %) and the Master's degree (44.2, 13.5 %) for Australia and Portugal respectively (see Table 9.2).

In this study, the response validity for Australia and Portugal was 100 and 85 % respectively. This cultural mixture will assist the researchers to justify the user participation importance from the two different nations' perspectives to enhance and enrich the NPMMW methodology, and to understand whether respondents from Australia and Portugal share common beliefs in relation to the importance of HCI and usability factors in the web development process.

Table 9.1 Field(s) of study—Australia and Portugal

Field(s) of study	Australia response (%)	Portugal response (%)
Information systems	27.9	44.9
Communications technology	2.3	18.4
Computer science	9.3	12.2
Multimedia	2.3	6.1
Graphics	7	2
Others—please specify	51.2	16.3

Table 9.2 Highest education level—Australia and Portugal

Highest education Level	Australia response (%)	Portugal response (%)
Higher secondary/pre-university	2.3	38.5
Professional certificate	0	1.9
Diploma	2.3	1.9
Advanced/higher/graduate diploma	0	3.8
Bachelor's degree	34.9	40.4
Post-graduate diploma	7	0
Master's degree	44.2	13.5
Doctorate (PhD)	9.3	0

9.7 Results

The outcomes from the survey were analysed using IBM SPSS software v.19. The researchers compared means and standard deviation, and used an independent T-test (see Tables 9.3 and 9.4). The rationale behind using T-test is to compare the actual means difference between Australia and Portugal in relation to the variation in the data. Furthermore, these statistics assisted the researchers to assess and evaluate the similarities and dissimilarities between the IS/IT professionals in Australia and Portugal in their attitudes toward HCI and usability principles and guidelines in the web development process. In Question 1, the researchers asked whether "usability is a very important aspect of the website development process." The results indicated that usability is a very important aspect in the website development process, especially in the design stage, with high average results (out of a maximum value of 5) for both Australia ($M = 4.58$, $SD = 0.586$) and Portugal ($M = 4.23$, $SD = 0.850$) (comparison: $t = -0.2665$; $df = 126$; $p = 0.009$). There was a statistically significant difference between the results for Australia and Portugal as the p-value was less than the nominal 0.05 value, with Australian participants agreeing significantly more strongly with the statement compared with the Portuguese participants.

These results confirmed the literature (Lavie et al. 2011; Sauer et al. 2010) findings that usability is an important concept in the web development process for preventing users 'frustration and increasing customers' loyalty toward the website. Respondents from both countries agreed that usability is an essential aspect of the

Table 9.3 Usability and HCI—Likert scale

Questions	Country	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)	Responses
Q1	Australia	0	0	4.7	32.8	62.5	64
	Portugal	1.6	1.6	12.5	40.6	43.8	64
Q1	Australia	7.8	21.9	20.3	34.4	15.6	64
	Portugal	1.6	12.5	23.4	53.1	9.4	64
Q3	Australia	0	0	21.9	62.5	15.6	64
	Portugal	0	0	37.5	51.6	10.9	64
Q4	Australia	1.6	0	9.4	57.8	31.3	64
	Portugal	0	1.6	18.8	62.5	17.2	64
Q5	Australia	1.6	0	10.9	56.3	31.3	64
	Portugal	0	1.6	21.9	60.9	15.6	64
Q6	Australia	1.6	1.6	42.2	40.6	14.1	64
	Portugal	0	7.8	37.5	43.8	10.9	64
Q7	Australia	1.6	0	6.3	53.1	39.1	64
	Portugal	0	3.1	23.4	59.4	14.1	64

Table 9.4 Usability and HCI—independent T-test

Questions	Country	Responses	Mean	SD	Mean comparison T-test		
					T-test	DF	P-value
Q1	Australia	64	4.58	0.586	−2.665	126	0.009
	Portugal	64	4.23	0.850			
Q1	Australia	64	3.28	1.201	1.506	126	0.135
	Portugal	64	3.56	0.889			
Q3	Australia	64	3.94	0.614	−1.820	126	0.071
	Portugal	64	3.73	0.648			
Q4	Australia	64	4.17	0.725	−1.794	126	0.075
	Portugal	64	3.95	0.653			
Q5	Australia	64	4.16	0.739	−2.018	126	0.046
	Portugal	64	3.91	0.660			
Q6	Australia	64	3.64	0.804	−0.443	126	0.659
	Portugal	64	3.68	0.793			
Q7	Australia	64	3.84	0.695	−3.490	126	0.001
	Portugal	64	4.28	0.723			

web development process as adopting it will make the web interface more attractive and easy to use and learn. However, it was noted that Australian respondents more strongly emphasized the importance of usability in the web development process than the Portuguese respondents. Question 2 examined whether "usability issues are very hard to work with, especially with immature businesses, since it takes time and money to learn about the concepts behind it". IS/IT professionals from Australia and Portugal have similar perspectives (Australia: $M = 3.28$, $SD = 1.201$; Portugal: $M = 3.56$, $SD = 0.889$) (comparison: $t = 1.506$; $df = 126$; $p = 0.135$).

The results indicated a non-significant difference between Australia and Portugal's results was noted, as both agreed that usability adoption in the website/interface development process, especially with immature businesses, is costly. One participant commented: "Yes it is very hard to tell the businesses how usability is important, because they are only thinking about themselves, such as how the website would suit their taste and not the target customer taste."

This agrees with Nies and Pelayo (2010) who posited that usability integration in real projects, especially for immature businesses, is costly, because of the constraints of limited time and the lack of availability of usability experts in the market.

Question 3 in the survey examined whether "adopting usability principles in the website development process will increase the businesses' profit." The survey results indicated that IS/IT professionals from both Australia and Portugal have comparable opinions regarding this concept, since the means are similar for the two countries (Australia: $M = 3.94$, $SD = 0.614$; Portugal: $M = 3.75$, $SD = 0.66$) (comparison: $t = -1.820$; $df = 126$; $p = 0.071$). These results indicated that Australian and Portuguese IS/IT professionals agreed about employing usability tools in the web development process, as they will attract more users to visit the websites, especially the marketing/online shopping once, and increase users' loyalty, and this can lead to an increase in businesses' profits, since many users will visit these websites. Survey respondents commented: "Usability is a very important marketing concept and should be taken seriously by businesses, individuals and designers" and "Usability and HCI improve processes that can help websites increase the hit rates. However, profit does not just depend on usability but also other aspects or attributes of a product that is advertised in the website." This agrees with Lee and Koubek (2010) who contend that applying usability principles in the web development process will assist businesses to attract more customers to their website, and their profits will be increased. Furthermore, several empirical studies (Cyr et al. 2005; Lowry et al. 2010; Martin et al. 2011) confirm that integrating usability in the website will increase trust especially in online shopping, and this will increase consumers' confidence when buying from these websites.

Question 4 examined whether "adopting usability principles in the website development process will encourage client-customer users (external) to revisit the website". IS/IT professionals from both Australia and Portugal agreed that these principles and guidelines are essential in the web development process to encourage users to visit these websites more and more (Australia: $M = 4.17$, $SD = 0.725$; Portugal: $M = 3.95$, $SD = 0.653$) (comparison: $t = -1.794$; $df = 126$; $p = 0.075$). There was a non-significant difference in the scores.

This result is similar to the findings reported in the literature, which indicated that the adoption and implementation of usability and HCI principles in the website development process will encourage users to visit the websites more often by avoiding user frustration, making the website more approachable, friendly and interesting, and winning the trust of the site visitors by meeting users' requirements (Ficarra et al. 2011; Lavie et al. 2011; Nicolson et al. 2011).

Question 5 sought to ascertain whether "Human Computer Interaction techniques should be part of the website development process since it is concerned with design, evaluation and implementation of interactive computer-based systems". The results indicated that there was a statistically significant difference in the scores between Australia and Portugal (Australia: $M = 4.16$, $SD = 0739$; Portugal: $M = 3.91$, $SD = 0.660$) (comparison: $t = -2.018$; $df = 126$; $p = 0.046$).

This result confirmed that Australian IS/IT professionals are more aware of the significance of HCI in the web development process compared with their Portuguese counterparts who might need more knowledge and skills in the design evaluation and implementation stages of the web development process. This result was supported by the survey response: "Making a site easy to navigate and find information is a priority for designers." The literature review indicated that HCI is essential in the web development process to ensure that the website interface is efficient and effective, and satisfies users' requirements (Isomursu et al. 2011; Maceli and Atwood 2011; Shi 2011). Question 6 examined whether "by adopting Human Computer Interaction aspects in the website development process the businesses' profit will be increased". The results indicated a non-significant difference: both Australian and Portuguese participants had similar positive perceptions regarding the relationship between HCI and businesses' profits (Australia: $M = 3.64$, $SD = 0.804$; Portugal: $M = 3.58$, $SD = 0.793$) (comparison: $t = -0.443$; $df = 126$; $p = 0.659$).

The survey respondents indicated that, initially, the use of these techniques in the website development process will be costly, but later businesses and organizations will reap the benefits of these techniques as their profits will be increased, more potential businesses will visit the website because of its efficiency, effectiveness and safety, and this will lead not only to increased profits but also to increased user satisfaction and trust in the website. This result confirmed the statements made in the literature (DePaula 2003; Olson and Olson 2003) that HCI will assist users and designers to meet their goals, objectives and aims by browsing through their interface or websites, as HCI is concerned with users' needs and satisfaction and will enhance their acceptance of the website/interface. A two-sample independent T-test was used to determine whether usability and HCI should be part of the website development process in order to improve the structure and functionality of a website (Question 7). This revealed a significant difference between Australia and Portugal ($t = 3.49$, $df = 126$, $p = 0.0.001$), where by Portugal had significantly higher mean scores ($M = 4.28$, $SD = 0.723$) than Australia ($M = 3.84$, $SD = 0.695$). This indicates that Australian IS/IT professionals might need more knowledge and skills regarding the application of usability and HCI principles and guidelines in the web development process.

These results confirmed that HCI and usability principles and guidelines are essential in the website development process, in line with the literature (Harbich and Hassenzahl 2011; Joshi et al. 2010; Kotamraju 2011). Lastly, usability and HCI principles and guidelines are used in the web development process, the former to formalize appropriate design goals at high level, and the latter to implement the principles using guidelines and tools.

9.8 Discussion

The survey outcomes confirmed the study's claim that designers and users should implement HCI principles and usability guidelines in the web development process particularly in the marketing websites. Furthermore, IS/IT professionals from both Australia and Portugal acknowledged and confirmed that HCI and usability principles and guidelines are essential in the website development process, as they will increase businesses' profits and encourage users to revisit the website. For example, user satisfaction and sales in e-commerce shopping sites will increase because of the high usability of websites (Cho et al. 2011; Martin et al. 2011). As well, usability is used to improve the safety, utility, effectiveness, efficiency of systems in general and in the marketing websites in particular. Leung and Law (2012) confirm that applying HCI and usability aspects will improve the chances of appealing the website to users and potential customers. A recent study by Issa and Turk (2012) show that poor usability and HCI in website design, specifically in the marketing websites can cause various negative consequences: making sites difficult to navigate for some users, causing frustration, leading users to move to other websites resulting in decrease site traffic and hence sale. Therefore, to reduce users' frustration and increase their commitment and loyalty to the marketing website, a New Participative Methodology for Marketing Websites (NPMMW) (Issa 2008) was developed to improve the design and development of a website, especially the marketing, by integrating HCI and usability as steps during the design stage, to allow users, analysts and designers (internal and external) to ensure that the website design meet the users' requirements, provides job satisfaction, and achieves the five goals of the discipline of HCI: "to develop or improve the safety, utility, effectiveness, efficiency, and usability of systems that include computers" (Robinson and Martin 2010, p. 119). To support the importance of HCI and usability especially in the web development process, the NPMMW methodology identifies four steps in the design stage: HCI, Usability, Navigation and Prototyping (Issa 2008, 2013). The HCI step requires users, analysts, and designers (internal and external) to determine whether the website design is practical. There are many specific issues that designers need to take into consideration when designing website pages, including text style, fonts, layout, graphics, and colour.

The Usability step allows users, analysts, and designers (internal and external) to ascertain whether the website design is efficient, effective, safe, easy to learn, easy to remember, easy to use and to evaluate, practical, and visible; has utility; and provides job satisfaction. The Navigation step is used to define the specific navigation paths between the entities throughout the website and to establish the communication between the interface and navigation in the hypermedia application. The Prototyping step is essential in the website design process by allowing users and management to interact with a prototype of the new website and to gain some experience in using it. This step will allow management to reduce costs and increase quality through early testing. The research concluded that more

techniques are needed for implementing HCI and usability principles and guidelines among industry, designers, and users. Usability and Human Computer Interaction (HCI) are important elements in the NPMMW methodology. These aspects are indispensable when creating a usable, effective, efficient, successful, trustworthy, user controlled, navigationally sound, speedy and secure website for the end-users (internal to the client organization) and client-customer users (external) simultaneously. For example, user satisfaction and the sales in the e-commerce shopping sites will increase due to high usability of websites. Usability is the "extent to which a system with [a] given functionality can be used efficiently, effectively, and satisfactorily by specified users to achieve specified goals in a specified context of use" (Te'eni et al. 2007, p. 2–3).

Usability "has been shown to be a key factor when the services of an organization use the Internet" (Flavian et al. 2006, p. 2). Trent Mankelow (2006, p. 53) corroborates that with good usability, several advantages will be bestowed on the business e-commerce websites by "increasing sales, reducing costs and boosting labour productivity, staff take less time to train, are more productive and make fewer mistakes". In addition, "the costs of development, maintenance and support decreases, and businesses have a better experience of dealing with your business". Furthermore, Flavian et al. (2006, p. 2) declared, "website usability is a very important part of the store's image and (that) it can influence shopping behaviour in a similar way to those aspects of traditional establishments". This study declares that HCI and usability are essential steps in the design stage that will allow users (end-user and client-customer), analysts, and designers (internal and external) to confirm that the website design meets the users' requirements, provides job satisfaction, and achieves the five goals for the discipline of HCI "to develop or improve the safety, utility, effectiveness, efficiency and usability of systems that include computers" (Diaper and Sanger 2006, p. 119). According to Te'eni et al. (2007 p. 22-23), the study of HCI is "not confined merely to the interface between the computer and user" but should be used to: develop more usable and successful systems; provide researchers with cohesive and cumulative knowledge for theory building, and; apply this theoretical knowledge to enhance real information systems. Finally, to develop a successful website, designers and users should use the NPMMW methodology in their design, since it is a user-centred methodology consisting of the stages and steps necessary for developing a website that meets the user requirements derived from the survey responses.

9.9 Significance Contribution from this Study: Theoretical and Practical

The results of this study confirmed that HCI and usability are essential in the web development process especially in the marketing websites, to improve website quality and increase user satisfaction and trust. This study made a new theoretical

and practical contribution to the current literature by raising the awareness of the significance of usability factors and HCI in the website development process among website designers and users. The theoretical contribution of this study is the new NPMMW methodology, which addresses the important issue of HCI and usability, and provides the tools and techniques for implementation. In the HCI step, users, analysts and designers, must consider specific issues when designing website pages, such as text style, fonts, layout, graphics, and colour. The usability step, on the other hand, allows users, analysts and designers to confirm whether the website is efficient, effective, safe, useful, easy to learn, easy to remember, easy to use and to evaluate, practical, and visible, and provides job satisfaction.

The adoption of the aforementioned HCI and Usability principles, when developing a website, will increase users' satisfaction and loyalty to the websites. The practical significance of this study is that it emphasizes the importance of HCI and Usability factors in the web development process, and it raises the awareness of this importance among the postgraduate students in Australia and Portugal. The first author developed a new postgraduate unit to prompt the appreciation and awareness of HCI and usability principles and guidelines in web applications. This course aims to prepare our students to develop a successful and an effective marketing website locally and globally to meet businesses and users' needs.

Finally, in 2012, a new survey was distributed in Australia and Portugal to examine students' awareness of and reactions to HCI and usability principles and guidelines, unit assessments and structure. The survey outcomes will be reported later in 2013 and 2014.

9.10 Limitation

The purpose of this study was to examine whether HCI and usability principles and guidelines are crucial in the website development process. This study examines the experience of IS and IT professional in Australia and Portugal. This study was undertaken as a research project by two lecturers in Australia and Portugal. In the future, further research with larger and diverse groups of IS and IT professional in other countries is required to strengthen the research aims and objectives.

9.11 Conclusion and Future Research

The role of HCI and usability principles and guidelines in the web development process was discussed in this study. The results of an online survey confirmed that both HCI and usability principles and guidelines are essential and crucial concepts in the web development process, especially in the design stage, as IS/IT professionals from both Australia and Portugal acknowledged their importance. The adoption of these concepts will improve the quality of the website in terms of its

effectiveness, efficiency, performance, and functionality, and will increase users' satisfaction and reduce users' frustration, making the website more effective and interesting; thereby encouraging users revisit the website. Furthermore, from this study, the researchers identified new, significant theoretical and practical contributions to the current literature, by raising the awareness of HCI and usability in the industry and education sectors, and assisting practitioners by offering more refined guidelines, techniques and tools. Furthermore, the NPMMW methodology was introduced in this study to assist designers and users to develop successful websites and to choose the best stages and steps which are required to match the website needs, since NPMMW methodology is contingent.

The adoption of NPMMW by industry will help businesses to increase revenue, improve overall user satisfaction, increase users' loyalty and retention, improve service levels and decrease operational costs. In the future, the first researcher will develop a website related to NPMMW (in a similar style to the UsabilityNet (www.usabilitynet.org website). This website will incorporate a software tool to facilitate selection of particular stages, steps and techniques from the contingent methodology to produce a tailored methodology for any specific project. This means that the first researcher will assist the designers and users to select the most appropriate stages depending on the situation. These situations vary with respect to project problem, budget, and time, to name a few relevant issues. Finally, further research with greater and various groups of IS and IT professional in other countries is needed to support the research intentions.

Appendix

Table A.1 Usability and HCI advantages and disadvantages (Issa 2008)

Usability Advantages	HCI Advantages	HCI and Usability Disadvantages
Efficient	Great usability	Lack of user frustration
Effective	Satisfaction	Lack of profile
Safe	Effectiveness	Difficult to navigate
Utility	Efficiency	Decrease site traffic
Easy to learn	Interaction with and through technology	Feel confused
Easy to remember	Seeking to understand and support human Beings	Get error messages
Easy to use	To identify that the website design is practical, specific issues that need to be taken into consideration when designing website pages such as text style, fonts, layout, graphics and color	

(continued)

Table A.1 (continued)

Usability Advantages	HCI Advantages	HCI and Usability Disadvantages
Practical		
Visible		
Job Satisfaction		

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