Progress in IS

Rudy Hirschheim
Armin Heinzl
Jens Dibbern *Editors*

Information Systems Outsourcing

Towards Sustainable Business Value

Fourth Edition

Springer

Progress in IS

More information about this series at http://www.springer.com/series/10440

Rudy Hirschheim · Armin Heinzl
Jens Dibbern
Editors

Information Systems Outsourcing

Towards Sustainable Business Value

Fourth Edition

Springer

Editors
Rudy Hirschheim
Business Administration
Louisiana State University
Baton Rouge, LA
USA

Armin Heinzl
LS ABWL und Wirtschaftsinformatik I
Universität Mannheim
Mannheim
Germany

Jens Dibbern
Department of Information Engineering
Institute for Information Systems
University of Bern
Bern
Switzerland

ISSN 2196-8705 ISSN 2196-8713 (electronic)
ISBN 978-3-662-43819-0 ISBN 978-3-662-43820-6 (eBook)
DOI 10.1007/978-3-662-43820-6

Library of Congress Control Number: 2014945951

Springer Heidelberg New York Dordrecht London

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

Preface

After exploring *Trends, Challenges and Opportunities* in the third edition of our book in 2009, we felt it is time again to re-assess the status quo of the contemporary Information Systems (IS) Outsourcing domain. For this reason, we invited renowned scholars and key practitioners to the fourth International Conference on Outsourcing of Information Services (ICOIS) to Mannheim, Germany, which was held in June 2013. The papers presented at the conference have been the basis for discussion and documentation of this edition of our book.

At Mannheim, it became obvious that the majority of the contributions to the conference shifted their focus towards new forms and mechanisms of outsourcing that aim at offering a more value-oriented perspective on IS outsourcing. Hence, we deemed it appropriate to change the subtitle of this fourth edition to *Towards Sustaining Business Value* in order to offer another excellent roadmap of the current IS outsourcing research, highlighting new perspectives while refining existing practices under a new common umbrella.

After carefully discussing and refining the submitted papers, we decided to structure the content of this book into seven parts: (I) Innovation Management, (II) Governance Frames, (III) Dynamic Governance Adaptation, (IV) Multi-vendor and Multi-client Ecosystem Management, (V) International Growth: The Case of China, (VI) Social Responsibility and Social Capital Management, and (VII) Crowdsourcing and Open Platforms. Each of these themes is explored in this book from a client or from a vendor value perspective. Like in the previous editions, our monograph serves as a basis for further interactions and discussions in the rich and dynamic field of IS outsourcing. We are convinced that the monograph is of interest to academics and graduate students in the field of Information Systems as well as to corporate executives and professionals who seek a better understanding of the underlying value drivers of IS outsourcing.

Such a piece of work is solely feasible, if many parties cooperate at a highly intense level. In fact, it would not be publishable without the significant input of all researchers involved. Thus, our deepest gratitude goes to all participating authors for their important contributions and professional cooperation. You have laid the foundation for this book! We also owe many thanks to those team members who

supported us with respect to the administrative activities of the underlying conference and this monograph. Therefore, we would very much like to thank Tommi Kramer and Lea Offermann from Mannheim for organising the third ICOIS. In a similar vein, we would also like to thank Fabio Isler from Bern who designed the ICOIS website, and who supported us in editing this book. While we are very grateful to the authors for the chapters of this book, we take responsibility for the content and any errors.

We hope that you, as our readers, find the fourth edition as vivid and insightful as our previous editions.

Baton Rouge, Louisiana — Rudy Hirschheim
Mannheim, Germany — Armin Heinzl
Bern, Switzerland — Jens Dibbern

Contents

Information Technology Outsourcing: Towards Sustainable Business Value

Rudy Hirschheim and Jens Dibbern

1 Introduction

The notion of outsourcing—making arrangements with an external entity for the provision of goods or services to supplement or replace internal efforts—has been around for centuries. Kakabadse and Kakabadse (2002) track one of the earliest occurrences of outsourcing to the ancient Roman Empire, where tax collection was outsourced. In the early years of American history, the production of wagon covers was outsourced to Scotland, where they used raw material imported from India in the production process (Kelly 2002). Outsourcing remained popular in the manufacturing sector, with part of the assembling in many industries being sub-contracted to other organizations and locations where the work could be done more efficiently and cheaply. Commenting on this unstoppable trend, Pastin and Harrison (1974) wrote that such outsourcing of manufacturing functions was creating a new form of organization which they termed the "hollow corporation" (i.e. an organization that designs and distributes, but does not produce anything). They note that such an organizational form would require considerable changes in the way organizations were managed. While they limited their research to the role of management in the hollow corporation, they comment on the substantial (and unpleasant) social and economic changes that the outsourcing of manufacturing was causing.

It was not long before the idea of outsourcing was applied to the procurement of information technology (IT) services also. While the current wave of IT

R. Hirschheim
E. J. Ourso College of Business, Louisiana State University, Baton Rouge, LA 70803, USA

J. Dibbern (✉)
Institute of Information Systems (IWI), Information Engineering, University of Bern, 3012 Bern, Switzerland
e-mail: jens.dibbern@iwi.unibe.ch

R. Hirschheim et al. (eds.), *Information Systems Outsourcing*, Progress in IS,
DOI 10.1007/978-3-662-43820-6_1

outsourcing can be traced back to EDS' deal with Blue Cross in the early sixties, it was the landmark Kodak deal in 1989 that won acceptance for IT outsourcing as a strategic tool. Many large and small outsourcing deals were inked in the years that followed. From its beginnings as a cost-cutting tool, IT outsourcing has evolved into an integral component of a firm's overall information systems strategy (Linder 2004). Still, reducing costs is an idea that never loses its appeal, and the opportunity to meet the IT demands of the organization with a less-expensive but well-trained labor pool has led organizations to look past the national borders, at locations both far and near, for such resources. There is little doubt about the continued acceptance and popularity of IT outsourcing as well as the trend towards outsourcing to different global locations. A recent Gartner study placed the global IT outsourcing market at $288 billion in 2013 (Gartner 2013). Moreover, outsourcing has grown beyond the domain of IT embodying decisions such as where and how to source IT to a much wider set of business functions. This inexorable trend towards outsourcing and offshoring brings unique sets of challenges to all parties involved. Western organizations have to walk a tightrope between the savings and efficiencies that offshoring could provide and the adverse reactions from a society increasingly disenchanted by the job displacement and loss that outsourcing brings.

2 IT Outsourcing Motivation and History

Although organizations outsource IT for many reasons, the growth of IT outsourcing can be attributed to two primary phenomena: (1) a focus on core competencies and (2) a lack of understanding of IT value (Lacity et al. 1994). First, motivated by the belief that sustainable competitive advantage can only be achieved through a focus on core competencies, the management of organizations have chosen to concentrate on what an organization does better than anyone else while outsourcing the rest. As a result of this focus strategy, IT came under scrutiny. The IT function has largely been viewed as a non-core activity in organizations; further, senior executives believe that IT vendors possess economies of scale and technical expertise to provide IT services more efficiently than internal IT departments. Second, the growth in outsourcing may also be due to a lack of clear understanding of the value delivered by IT (Lacity and Hirschheim 1993). Though senior executives view IT as essential to the functioning of the organization, it is viewed as a cost that needs to be minimized. Believing that outsourcing will help meet the IT needs of the organization less expensively, organizations have chosen to outsource. Interestingly, some researchers (e.g. Hirschheim and Lacity 2000) have found that outsourcing has not always yielded the benefits that organizations had hoped for. This has led to numerous normative strategy proposals to help organizations achieve success (Cullen et al. 2005; Linder 2004).

Initially, when organizations looked to external sources for the provision of IT services, the vendor provided a single basic function to the customer, exemplified by facilities management arrangements where the vendor assumed operational control over the customer's technology assets, typically a data center. The agreement between Blue Cross and Electronic Data Systems (EDS) in 1963 for the handling of Blue Cross' data processing services was different from such previous 'facilities management' contracts. EDS took over the responsibility for Blue Cross's IT people extending the scope of the agreement beyond the use of third parties to supplement a company's IT services. EDS's client base grew to include customers such as Frito-Lay and General Motors in the seventies, and Continental Airlines, First City Bank and Enron in the eighties. Other players entered the outsourcing arena as well, the most noteworthy of those being the Integrated Systems Solutions Corporation (ISSC) division of IBM. ISSC's deal with Kodak in 1989 heralded the arrival of the IT outsourcing mega-deal and legitimized the role of outsourcing for IT. Following the success of the Kodak deal, well-known companies around the world quickly followed suit—General Dynamics, Xerox, and McDonnell Douglas in the U.S.; Lufthansa and Deutsche Bank in Germany; Rolls Royce and British Aerospace in Britain; KF Group in Sweden; Canada Post in Canada; Telestra, LendLease, and the Commonwealth Bank of Australia in Australia and ABN Amro in the Netherlands (Dibbern et al. 2004).

IT outsourcing has evolved from sole-sourcing and total sourcing arrangements of yester-years where one vendor provides all IT services to its client to complex arrangements involving multiple vendors and multiple clients (Gallivan and Oh 1999). According to Mears and Bednarz (2005) companies are also outsourcing on a much more selective basis than ever before. The tools and resources available today make it easier for IT executives to manage their IT portfolio and achieve the economies they need without outsourcing everything. (Of course a key challenge is determining what pieces of the IT portfolio to outsource and what to keep internal.) Outsourcing also now embraces significant partnerships and alliances, referred to as co-sourcing arrangements, where client and vendor share risk and reward. These co-sourcing arrangements build on the competencies of the client and vendor to meet the client's IT needs. Kaiser and Hawk (2004) provide recommendations to organizations considering co-sourcing arrangements with offshore vendors. They note that organizations should avoid total dependency on the vendor by maintaining their IT competencies in-house.

IT outsourcing—as it was practiced through the turn of this past century—was primarily domestic outsourcing. While it had considerable impact on the way organizations structured and managed their IT, and to some extent, redefined the roles of IT managers, the impacts were largely limited to the client and vendor firms' boundaries with the possible exception of the creation of some new intermediary organizations (e.g. outsourcing consulting firms). Domestic IT outsourcing barely created a stir in the public press perhaps because no one foresaw that the outsourcing of a critical knowledge-work function (i.e. IT) might have more dramatic effects if these tasks could be performed not domestically but globally. In some way this is surprising because most international firms were

hiring numerous foreign IT people, and importing people from places like the Philippines, India, etc. on staff augmentation contracts. Indeed, according to Sheshabalaya (2004) and Friedman (2005), major changes were already taking place in IT in the late 80s and throughout the 90s in the US but went unnoticed, mostly because of the dot.com boom and Y2 K remediation needs. However, this was about to change.

3 Offshore Outsourcing

A prominent change in the outsourcing arena is the growth in offshore outsourcing (Lacity and Willcocks 2001; Morstead and Blount 2003; Robinson and Kalakota 2004). Driven by the pressures of globalization and the ensuing need to address opportunities and threats from global competition, companies are increasingly looking at less-expensive resources available in offshore locations. And these less expensive resources are readily available in countries like India, China and the Philippines.

An outsourcing arrangement is considered 'offshore outsourcing' when the responsibility for management and delivery of information technology services is delegated to a vendor who is located in a different country from that of the client (Sabherwal 1999). While the three well-known countries in the offshore outsourcing arena (the so-called three I's) are India, Israel, and Ireland (Carmel 2003a, b), near-shore providers in Canada and Mexico are also popular among U.S. clients just as eastern Europe has become a prime near-shore option for central European countries, because of geographic and cultural proximity. Some clients find the near-shore scenario more attractive because these locations facilitate continuous monitoring (Rao 2004). China is also quickly gaining popularity because of its low labor costs.

As in domestic outsourcing, a primary driver of offshore outsourcing is the continued pressure organizations face to cut costs associated with IT while maintaining and improving processes (Nicholson and Sahay 2001; Rajkumar and Dawley 1998). The time differences between the client and the offshore vendor locations create extended work days which could contribute to increased IT productivity. With efficient distribution of work between the client and vendor locations, projects can theoretically be finished faster (Apte 1990; Carmel and Agarwal 2001; Carmel and Agarwal 2002; Morstead and Blount 2003; Rajkumar and Dawley 1998; Ramanujan and Lou 1997).

Organizations also turn to offshore outsourcing because of the lack of IT resources to perform required tasks. Faced with the lack of trained professionals, organizations look to foreign shores to gain access to knowledgeable IT personnel and valuable IT assets (Apte et al. 1997; Morstead and Blount 2003; Rottman and Lacity 2004; Sahay et al. 2003; Terdiman 2002). Offshore vendors typically have well-trained IT personnel with the requisite technical knowledge and skills. These vendors have also recognized the need to train their staff not only in the latest

technologies, but also in management and communication skills and have established numerous world-class facilities to do so (Khan et al. 2003). Such technical expertise and qualifications of the staff make these vendor firms very attractive to clients, since clients look to outsource activities that involve high level of technical skills (Aubert et al. 2004).

In addition, offshore vendors have obtained certifications to prove their ability to execute and deliver quality work. These certifications assure the client organizations that the vendor is following quality practices in the management of the project and are important in gaining the client's trust and developing the client–vendor relationship (Heeks and Nicholson 2004). Vendors aim to align their practices with standards in different areas including software development processes (e.g. CMM), workforce management (e.g. PeopleCMM), and security (e.g. ISO 17779) (Hirschheim et al. 2004). Qu and Brocklehurst (2003) find that client organizations pay particular attention to these certifications in the vendor evaluation and selection process. However, Coward (2003) comments that while large organizations look towards certifications for quality assurance and success in offshore projects, small and medium enterprises focus on personal connections in the selection of vendors.

Finally, as in domestic outsourcing, the bandwagon effect (Lacity and Hirschheim 1993) comes into play in offshore outsourcing as well. The sheer fact that these offshore choices are available and that other organizations are taking advantage of these options prompt other organizations to consider offshore outsourcing (Carmel and Agarwal 2001; Carmel and Agarwal 2002; Gopal et al. 2002; Overby 2003; Qu and Brocklehurst 2003). With such drivers, offshore outsourcing is growing at a faster rate in many countries than domestic outsourcing.

Offshore arrangements come in a variety of flavors to match the client's desire for ownership and control: conventional offshore outsourcing arrangements, joint ventures, build-operate-transfer arrangements, and captive centers. These arrangements span the continuum from complete hand-over of the project to an offshore vendor in conventional offshore outsourcing arrangements to establishing a captive center in the foreign country. While the client usually has a low to medium level of control on the operation and delivery services in conventional offshore outsourcing, the client retains full ownership and control of the assets, personnel, management and operations of a captive center. Such captive center arrangements are not strictly outsourcing arrangements, since in outsourcing the responsibility for the management of the IT services is handed off to an external vendor. These captive center arrangements fit under the umbrella of "offshoring" (Robinson and Kalakota 2004). In joint ventures and build-operate-transfer arrangements, the client is able to take advantage of the vendor's knowledge of the local market, while retaining a certain amount of control. Such shared ownership can reduce the risk of offshore outsourcing. A build-operate-transfer is an arrangement where a domestic client contracts with an offshore vendor to set up an offshore center, with the goal of taking over the ownership and management of the

center once it is established (Anthes 1993; Khan et al. 2003; Kumar and Willcocks 1996; Morstead and Blount 2003).

A related development has been the offshore outsourcing of IT-enabled services and business processes. Many offshore IT vendors have produced offshoots to manage business process outsourcing (BPO) deals. Examples are Wipro's Spectramind and Infosys' Progeon. The BPO market is making giant strides and is growing more rapidly than the IT offshoring market. Currently, IT outsourcing dominates offshore outsourcing, but this is likely to change in the future.

More recently, the field has seen the emergence of new form of sourcing variously referred to as 'microsourcing' (Carmel 2008), 'human cloud' (Kaganer et al. 2013), 'crowd sourcing' (Howe 2006), 'collective intelligence' (Malone at al 2010) whereby clients use online platforms for the provision of global sourcing of services, including website development, programming, legal service, creative design, etc. (Kaganer et al. 2013; Lu et al. 2013). Carmel (2008) viewed this phenomenon as the "commoditization of process" of services from the e-marketplace. Microsourcing is gradually becoming a mainstream method of outsourcing for personal users, entrepreneurs, small business owners (Obal 2006), but more recently even large companies are taking notice. Indeed, there are now dozens of websites used as online platforms for the settlement of microsourcing deals, including vWorker.com, E-lance.com, Guru.com, CrowdSpring, InnoCentive, Odesk, etc. According to Smartsheet (2009), over two million service providers registered on the 10 major online sourcing websites between the years 2000 and 2009, with over $700 million dollars paid to the providers.

4 Motivation for the Fourth Edition

When we produced the first edition of the book *Information Systems Outsourcing in the New Economy*: *Enduring Themes*, *Emergent Patterns and Future Directions* in 2002, the motivation rested on the need to take stock of a field which had been around for about 10 years. Since then, we published a paper which offered a good overview of the field (Dibbern et al. 2004). But because it was a paper, it could not do justice to the depth and breadth of the outsourcing landscape which includes the more recent development of offshore outsourcing and business process outsourcing. To that end, a second edition was developed in 2006. In that follow-up edition, we reproduced a number of what we consider more 'classic' papers in the field and supplemented them with a large number of new contributions, in particular on the topic IT offshoring. This new direction was reflected by the subtitle: *Enduring Themes*, *New Perspectives and Global Challenges.*

Following on from the second, came the third edition in 2009 which included a completely new collection of papers on the topic of information systems outsourcing. Similar to the first edition, the contributions of the third edition were based on an international conference that we held for the third time involving key researchers from around the world with a proven track record in the field of

Information Systems Outsourcing. The third edition book was based on the research presented by the participants attending the 3rd International Conference on Outsourcing of Information Services which was held in Heidelberg, Germany, May 29–30, 2007. This edition was reflected by the subtitle: *Enduring Themes*, *Global Challenges*, *and Process Opportunities*.

Recently, we held our 4th International Conference on Outsourcing of Information Services (www.ICOIS.de) which was held in Mannheim, Germany, June 9–11, 2013. As in previous ICOIS events, this brought together key researchers in the field discussing their latest research and thinking about outsourcing. The papers presented at the conference are the basis of this current edition of the book. It is important to note, that the majority of the contributions to the conference shifted their focus towards new forms and mechanisms of outsourcing that aim at offering a more long-term and value-oriented perspective on IT outsourcing. Hence, the subtitle of this fourth edition has been changed to: *Towards Sustaining Business Value*.

We believe this new edition offers an excellent roadmap of the current IT outsourcing academic literature, highlighting new perspectives while also considering what has been learned so far and how the work fits together under a common umbrella.

5 Book Structure and Outline

5.1 Towards Sustaining Business Value

In providing such a common umbrella, we refer to the notion of sustainable business value. As IT outsourcing has matured, the focus has shifted from a cost savings and short-term orientation to one where outsourcing is seen to facilitate long-term sustainability including objectives beyond cost savings (Dibbern et al. 2004). Sustainability refers to the capability of an organization to endure over a long period of time (Barney 1991; Ross et al. 1996). For such sustainability to occur, organizations must produce sustainable business value. This involves providing avenues for organizational profitability which need to handle a dynamic and changing world. Indeed, sustainability is 'multifaceted, involving economic, social, and environmental concerns' (Hart and Milstein 2003). This would likely include multiple and possibly conflicting objectives and dynamic changes by which organizations need to adapt. The challenge for organizations then is to develop a framework which on the one hand provides a stable base for integrating multiple objectives while also being flexible enough to react to both endogenous and exogenous changes.

This book addresses this challenge from two alternative perspectives that need to be taken into account when attempting to create sustainable business value through outsourcing: the client perspective and the vendor perspective. Each has

their own view about what would be necessary to both create and sustain such business value. Moreover, as the papers presented at our conference attest, there are a variety of areas where sustainable business value can be created from both the client and vendor side. Figure 1 offers an overview of the broad areas covered in our book.

Each of these themes is explored—to a greater or lesser extent—in this book. More specifically, the papers in this volume cover a multitude of issues associated with the seven identified themes. Figure 1 provides an overview of the structure of the fourth edition of *Information Systems Outsourcing*.

The focus of the following outline will be on the main IT outsourcing content of each chapter and its papers. Each contribution has focused on different aspects within each category.

5.2 Innovation Management

The first issue of sustainable business value refers to (I) *Innovation Management* where outsourcing is seen as a tool to help organizations to radically or incrementally change core elements of their information (technology) systems, including their underlying technologies, business processes, products or stakeholders and people. Although early work on outsourcing has pointed to the transformational potential of outsourcing (DiRomualdo and Gurbaxani 1998), this view that outsourcing can leverage the innovation potential of a firm has mostly been ignored in the literature. Innovation has mostly been considered as something that came primarily from within an organization. The first two papers in our book stand in opposition to this view. They offer some new insights into how innovation can take place in IT outsourcing arrangements.

Aubert, *Iriyama*, *Kay*, *and Kishore* develop a set of propositions on how outsourcing can stimulate innovation. The key premise of their theorizing is that it matters what kind of innovation is being considered. Specifically, it is important to differentiate between modular versus systemic innovations, and whether the innovation process is characterized by exploration or exploitation learning. The innovation objective and the innovation process have implications for sourcing, contracting, supplier selection, and transaction costs.

Lacity and Willcocks focus on innovation in business process outsourcing (BPO). They argue that innovations accumulate over time and that it is hence important to take a dynamic view of the innovation process. Based on both qualitative and quantitative data of BPO arrangements they identify a set of effective versus ineffective practices supporting dynamic innovation. These practices can be grouped into those incentivizing innovations and those supporting the process of delivering innovations throughout the duration of an outsourcing relationship. These practices should be enacted and supported by strong leadership pairs involving both sides of the relationship: the client and vendor.

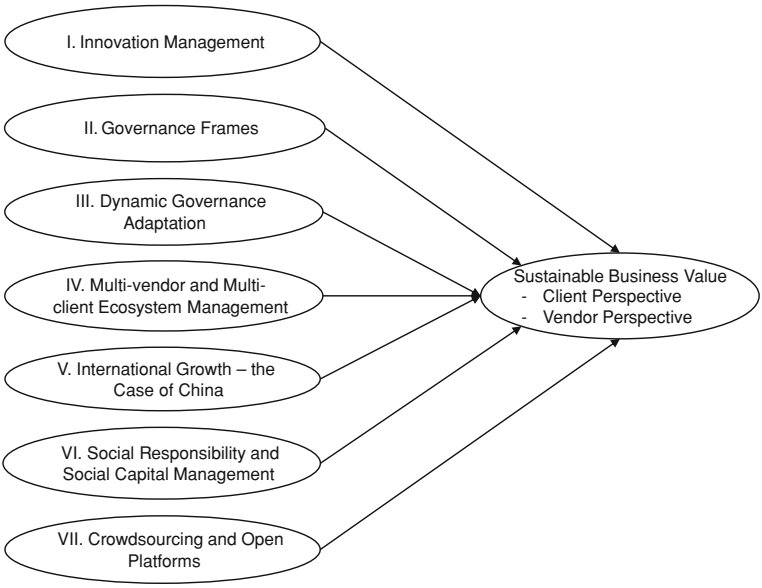


Fig. 1 Major themes covered in the book

Taken together, these two studies show that in order to realize innovation in outsourcing it requires an adequate up-front configuration and dynamic adaptations. Configuration and adaptation are also two important themes in IT outsourcing governance in general and are taken up in the next two parts on (II) *Governance Frames* and on (III) *Dynamic Governance Adaptation*.

5.3 Governance Frames

Providing solid governance frames where vendors and clients develop specific provisions for effectively managing the outsourcing arrangement has been an enduring theme in IS outsourcing research. It is largely agreed that the research issues in outsourcing have evolved from whether to outsource to how to manage outsourcing. Despite the understanding offered by the studies on IT outsourcing relationships, PricewaterhouseCoopers (2009) found that only 40 % of client/vendor relationships were working effectively, indicating that many organizations and vendors still need to resolve relationship issues. While the contract has been viewed as a foundation of the outsourcing relationship, there is increasing interest in the interaction between the contract and its execution in the form of formal control as well as interactions between formal and informal governance mechanisms. Moreover, there is increasing interest in overarching governance frames that provide an overall umbrella for steering all sourcing arrangements of an

organization. This includes general guidelines and rules for the decision, vendor selection, contracting, and relationship management. Establishing such stable governance frames provides the basis for steering the client–vendor-relationship and makes up an important component for achieving sustainable outsourcing success. Three papers in our book provide fresh insights into the design and impact of such governance frames.

Langer, *Mani and Srikanth* focus on formal control mechanisms and how they can facilitate the integration of two seemingly opposing objectives, namely that of client satisfaction and vendor profitability. They view control from the vendor perspective. Based on the analysis of a significant number of strategic IS outsourcing contracts they find evidence for the importance of choosing the right control mechanisms to ensure that both client and vendor objectives are met. Thus, balancing controls is a key factor for balancing objectives. Formal controls should manifest the commitment of the vendor to act in accordance with the client's strategic objectives. The issue of commitment also plays a central role in the next paper.

Currie and Gozman take a broader perspective on control by including regulatory controls that are enforced by the institutional environment in which IS outsourcing arrangements are embedded. This is exemplified by a case of a major IS vendor responsible for implementing an IT system at eight clients in the finance industry where the implementation of financial regulations was a key aspect of the implementation of the IT systems. This provides an interesting case as the trust that the clients gain in the IT vendor is linked to a network of trust relationships including the ones between the financial organizations and the financial regulator, the financial organizations and the investors, and the investors and the IT system. In other words, in order to provide sustainable business value, IT vendors do not only need to understand the business of the client, they also need to understand how the client business is influenced by its institutional environment and how the IT systems that they provide should embed such institutional regulations.

Another important aspect that is often overlooked in establishing governance frames is that of governing the upfront sourcing decision. While many organizations have established central sourcing units that seek to oversee the entire portfolio of IS functions, tasks and projects to make holistic sourcing decisions, there is little guidance in terms of decision aids. This gap is taken up next.

Kramer, *Eschweiler and Heinzl* develop a decision support method and tool that helps firms to choose appropriate candidates for outsourcing among various software development projects. Essentially, the model takes software requirements as inputs and considers the specific properties and interdependencies between requirements to identify outsourcing candidates. Such decision support systems can add to sustainable business value as they help to ensure that all sourcing decisions are made on the basis of a consistent frame that ensures alignment with a firm's strategic objectives.

5.4 Dynamic Governance Adaptation

Given the importance of establishing stable governance frames, two key questions remain unanswered. First, how can such stable frameworks be established and, second, will they endure for a long time or do they need to be constantly adapted? Due to dynamics in the environment, such as business changes, technology changes, partner changes, or regulatory changes, organizations are often confronted with unforeseen events. Such unforeseen events may not only make it difficult to establish stable frames but they may also call for adaptions over time. Understanding such dynamics is the motivation of a rather new stream of research that strives towards a process-theoretic understanding of outsourcing governance (Huber et al. 2013). Three papers in our book address the issue of *Dynamic Governance Adaptation*.

Huber, *Fischer*, *Dibbern and Kirsch* examine control adaptations in the context of outsourced software development projects. Such projects are usually initiated with a number of high level project goals that may be written into the contract. The key premise of the study by Huber et al. is that as IS outsourcing projects evolve, high level project goals may be translated into more and more project-specific controls which may affect project success in different ways. The results of a multiple case study show that increasing control specificity can be both beneficial and detrimental to the achievement of the initial project goals. Control specificity is beneficial if it results from a translation process where only the stakeholder context (and not the task) is adapted. It is detrimental if the project becomes highly dynamic and independent where the nature of the software development task is significantly altered over time eventually leading to a misfit with the initial project objectives. The results provide implications on the interaction between such goal and control drifts in IT outsourcing projects and how such drifts may be interrupted.

Heisekanen, *Hekkala*, *Newman*, *and Eklin* examine a number of system development projects that over time were outsourced by a University to the same vendor. Their focus lies on the changing role of the client boundary persons (or spanners) in steering the projects and the vendor. For example, the role of the boundary spanning person may shift from a problem solver to a gatekeeper that ensures that the project stays on track as defined in the contract. While emotions and learning play an important role for the boundary spanner practices to evolve, the study also shows the importance of the contract as the foundation for the actions taken by the boundary spanner.

Krancher and Dibbern seek to explain the effect of governance adaptations during the early stage of an IT outsourcing arrangement. They focus on the transition phase in software maintenance outsourcing projects, where the key objective is to transfer knowledge to the incoming new vendor personnel so that they can effectively and self-responsibly perform the maintenance tasks. Based on case evidence and system dynamics modeling they show how effective learning during transition can be stipulated by balancing the cognitive load of the learner

(i.e. the incoming vendor software engineer) through a number of interrelated managerial activities, such as selecting vendor engineers with the right level of prior expertise, adapting the complexity of the learning tasks (i.e. training maintenance tasks), and adapting the level of help. They also show how these activities interact with changes in vendor expertise and trust in the vendor.

Overall, these three studies show how enacting and adapting governance frames can add to achieving sustainable outsourcing success.

5.5 Multi-vendor and Multi-client Ecosystem Management

The governance issue is further noted in (IV) *Multi-vendor and Multi-client Ecosystem Managemen*t which relates to how outsourcing can be effective when the arrangement involves multiple vendors and/or multiple clients. In an effort to streamline their sourcing arrangements many organizations have focused their outsourcing endeavors on a selection of strategic partners that need to be orchestrated in a multiple-vendor arrangement. The flipside of multi-vendor arrangements are multi-client arrangements which have been enabled by new technological interfaces and standardization of services. A case in point is Software-as-a-Service arrangements. These arrangements constitute a shift from the classical dyadic client–vendor relationship with customized services for each client to one where multiple clients are served by the same vendor that draws on a portfolio of standard services that can be composed individually for each client, but still qualify a standard service. Overall, such outsourcing arrangements which involve multiple vendors and/or multiple clients offer new challenges that organizations are often ill-prepared for. Four papers provide new insights into how to cope with such challenges.

Fisher, *Hirschheim*, *Jacobs and Lazaro* provide a historical perspective of the emergence and evolution of a multi-vendor outsourcing arrangement in a large Australian telecommunications company. The longitudinal case shows the preconditions of the initiation of a multi-sourcing arrangement including four vendors of which three were offshore vendors in India. They further show how the challenges of managing the multiple vendors were addressed, and how a strategic shift and associated new technological demands led to the conversion to a prime-contractor arrangement with a fading out of the multi-vendor arrangement.

Wiener and Saunders reflect on the case of an internationally operating German company in the footwear and apparel industry that moved from a single vendor to a multi-vendor offshore outsourcing arrangement. The results from their case analysis show that increasing the number of vendors from one to three helps to avoid vendor lock-in and increases flexibility; however adding new vendors to an existing vendor, also leads to challenges of balancing the trade-off between upholding competition and cultivating cooperation between the vendors.

Moreover, such arrangements create internal challenges, such as encouraging acceptance of the incoming vendors and coping with increased management overhead.

Jin, *Kotlarsky and Oshri* also focus on multi-sourcing arrangements, where the tasks outsourced to the particular vendors are interdependent and hence require coordination. They argue that the key challenge of coordination lies in the integration of knowledge between vendors. Accordingly, they develop a number of propositions on how such knowledge integration can be achieved and how this affects overall performance.

Stuckenberg, *Kude and Heinzl* take the perspective of a Software-as-a-Service (SaaS) vendor that faces the challenge of simultaneously operating and further developed the same software for multiple clients. While previous research has largely treated operation and development as separate processes, the authors show how both are integrated. Based on six case studies of SaaS vendors they highlight the key challenges and opportunities of this integration effort.

5.6 International Growth: The Case of China

There is a myriad of issues associated with the emergence of outsourcing in a global context especially in terms of both new global clients and global vendors. As outsourcing clients as well as vendors emerge from all corners of the globe, the challenges and opportunities become immense. One case in point for international growth is the Chinese outsourcing market, which is gaining increasing attention in research. While China has been a key outsourcing destination for the Japanese market for quite some time, it faces the challenge to grow internationally. Two papers take a closer look at the conditions and strategic moves for sustained global growth.

Gallivan and Tao examine how IT service standards are being developed in China. They report on a country case study in which the authors document (over a 3 year period) the process of standard development of IT services. The results show that this process deviates quite strongly from the typical patterns observed in other standard setting processes. In particular, there was no evidence of conflict between the participating parties during the process. Some conclusions are drawn on why this is the case. In general, however, the speed with which such standards are being developed is impressive showing the strong desire of the Chinese market to make progress in the global IT services market.

Su shows how Chinese IT services firms enter into new markets. This is exemplified by a multiple case study project involving 13 major Chinese IT vendors and how they expanded their business internationally (into the U.S. and Japan) and domestically. Their results suggest that both the decision in which markets to enter and the decision on how to enter a market are strategically driven by capability and relational considerations, while also being flexible and adaptive.

Overall, these two studies show that in order to create sustained business value internationally IT vendors need to adopt the quality assurance processes of their industry and their home market and they need to constantly adapt their capabilities to enter new markets. They will also need to enter new markets in order to develop new capabilities.

5.7 Social Responsibility and Social Capital Management

As the example of China has shown, the capacities for IT service provisioning have grown significantly around the world. Countries like India are now among the leading counties in terms of the absolute number of people employed in the IT sector. And yet, the relative number of people employed in the IT sector in established and emerging IT offshore regions is still relatively small and concentrated in a few regional hubs with high population density. Poverty is still widespread among the rest of the population and the rural areas in particular.

Accordingly, companies are increasingly confronted with the need to take social responsibility into account in their IT offshoring engagements. This is true for both the customers of IT offshore services and the providers. Ideally, client and vendor develop a shared social responsibility. The basis of such a shared responsibility may be the general social capital developed in an IT outsourcing relationship. The first two papers in this chapter focus on issues of social responsibility. The third focuses on social capital management in general which provides the basis for reaching shared objectives.

Carmel, *Lacity and Doty* view the issue of social responsibility in the broader context of impact sourcing. Impact sourcing refers to sourcing models where services are delivered by employees with extremely low wages (i.e. that fall into the poverty category). In particular, in BPO there are many labor-intensive jobs that require low level skills. This creates an interesting trade-off; on the one hand, BPO creates jobs; on the other hand, employees should not be exploited. The paper provides an overview of different models of impact sourcing arrangements that can be viewed from various perspectives with different value propositions, where social responsibility is one key issue.

Bin and Nicholson focus on the issues of shared social responsibility between the client firm and the offshore vendor. Based on a single case study they show how the client and the vendor can jointly develop social responsibility practices as part of their corporate social responsibility. Such practices can contribute to the generation of mutual trust as a key enabler of relationship quality and hence outsourcing success.

George, *Hirschheim*, *Jayatilaka and Das* broaden the view on the client–vendor relationship by analyzing it from a social capital perspective. As such, trust is one dimension of the relational dimension of social capital which is complemented by the structural and cognitive dimensions of social capital. They argue that the

development of all three dimensions of social capital along the different phases of an outsourcing arrangement (from partner selection to outsourcing evaluation) can lead to new intellectual capital that feeds back into the generation of social capital.

5.8 Crowdsourcing and Open Platforms

Finally, there are new arrangements that move beyond the classical dyadic outsourcing relationships between client and vendor, and that appear to be gaining momentum in the IT sourcing market. These are models of (VII) *Crowdsourcing and Open Platforms*, where organizations seek to integrate a wider range of service entities into their service production and delivery chain. The key premise of such arrangements is to make use of distributed knowledge resources in order to leverage one's own knowledge base.

Nevo, *Kotlarsky and Nevo* explore the implications of crowd sourcing for IT vendors. They argue that IT vendors can draw on the crowd in generating and providing IT services to their clients. The results of a case study of a technology organization with crowd sourcing experiences shows that the integration of the crowd requires new vendor capabilities driven by the duality of roles that vendors take in such outsourcing arrangements; they are both clients of the crowd and providers to their clients.

Frutiger, *Slaughter*, *and Narasimhan* examine the role of open platform ecosystem to enable the integration of various vendors in the process of software development. While software ecosystems are increasingly formed in the standard software industry (e.g. around SAP, Oracle or Apple) as well as in open source software development (e.g. Linux) such platforms have rarely been deployed to provide the basis for project-based cooperation among software firms. The authors take the case of the military aviation industry as an example where such a platform ecosystem is emerging and actually replacing a former complex multi-vendor network dominated by a keystone player. They show that such an open platform ecosystem brings in new players with new coordination roles that likely lead to a significant reduction in the cycle time of developing, enhancing, updating, and maintaining avionics software which makes up a fundamental asset in the process of innovating military aircrafts.

While both papers point out the challenge of integrating multiple parties in large IT projects—which has also been viewed as key challenge in our chapter on (4) Multi-vendor and Multi-client Ecosystem Management—the coordination and integration challenges in such crowdsourcing and open platform ecosystem arrangements are leveraged by the openness of such arrangements regarding both the IT solution itself as well as the number of parties engaged in such arrangements. If the challenges are appropriately mastered, then they are a strong leverage factor for creating sustained business value through outsourcing.

6 Conclusions

In reading the various chapters in this book, we reflected upon what we know and what we don't know about the field. Although the fourth edition of the book did much to document what has been learned about IT outsourcing since our last edition in 2008, numerous interesting questions remain. In this book we have framed the contributions under the topic of sustained business value. This is not merely a shift towards a new value proposition. Instead sustained business value is a multifaceted issue that manifests in various aspects that have to do with a more holistic and more long-term oriented perspective on IT outsourcing. While in the early days of IT outsourcing each particular IT outsourcing deal was custom-tailored to the needs of the organization, including custom contracting and custom governance, the increasing complexity of IT outsourcing arrangements including multi-vendor, multi-client, global sourcing and impact souring arrangements as well as new coordination mechanisms such as platform ecosystem and crowd-sourcing, suggests the need for simplicity, standardization and durability, while at the same time increasing the need to remain flexible and adaptive to react to endogenous and exogenous change.

In general, the future of IT outsourcing appears wide open with many unanswered questions. For example, will the outsourcing model evolve into more of a (standard) services model such as we are now seeing with software (i.e. SaaS)? If this service model prevails, what areas will it cover—infrastructure, platform, desktop, etc.? Will outsourcing continue to expand to embrace even more business functions such as accounting & finance, legal, HR, logistics, R&D, engineering, knowledge processing, and marketing and to what extend can IS remain to be separate component from other business functions that can be sourced individually? And what about innovation? Will outsourcing enhance or destroy innovation? How will outsourcing differ between different organizations in different industries in different countries (e.g. first, second, third world)? Will organizations tire of outsourcing and offshoring and decide to bring IT back in-house? How will organizational politics influence outsourcing—especially global outsourcing—decisions now and in the future? And what about new outsourcing trends such as micro-sourcing and crowdsourcing? How will they disrupt the way small, medium and large organizations choose amongst sourcing options?

We have tried to articulate some of these important questions but there are many more. Hopefully this book will help motivate individuals to either begin research in the field or continue engaging in outsourcing research. Much has been done, but there is still much more to be done. We hope the reader enjoys the papers in this volume. Happy reading!

References

Anthes, G. (1993) In depth; Not made in the USA. In *Computerworld*.

Apte, U. (1990). Global Outsourcing of Information Systems and Processing Services. *Information Society, 7*(4), 287–303.

Apte, U. M., Sobol, M. G., Hanaoka, S., Shimada, T., Saarinen, T., Salmela, T., et al. (1997). IS outsourcing practices in the USA, Japan and Finland: A comparative study. *Journal of Information Technology, 12*, 289–304.

Aubert, B. A., Patry, M., & Rivard, S. (2004). A transaction cost model of IT outsourcing. *Information & Management, 41*(7), 921–932.

Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*(1), 99–120.

Carmel, E. (2003a). The new software exporting nations: Success factors. *Electronic Journal of Information Systems in Developing Countries, 13*(4), 1–12.

Carmel, E. (2003b). Taxonomy of new software exporting nations. *Electronic Journal of Information Systems in Developing Countries, 13*(2), 1–6.

Carmel, E. (2008). Micro-sourcing, is this the eventual global sourcing landscape? In E. Carmel (Ed.), *Global tech: Software, offshoring, distributed teams, time zones, tech policy, information technology and more*.

Carmel, E., & Agarwal, R. (2001). Tactical approaches for alleviating distance in global software development. *IEEE Software*, *1*(2), 22–29.

Carmel, E., & Agarwal, R. (2002). The maturation of offshore sourcing of information technology work. *MIS Quarterly Executive, 1*(2), 65–78.

Coward, C. T. (2003). Looking beyond India: Factors that shape the global outsourcing decisions of small and medium sized companies in America. *EJISDC: The Electronic Journal on Information Systems in Developing Countries, 13*, 10.

Cullen, S., Seddon, P., & Willcocks, L. (2005). Managing outsourcing: The lifecycle imperative. *MISQ Executive, 4*(1), 229–246.

Dibbern, J., Goles, T., Hirschheim, R. A., & Jayatilaka, B. (2004). Information systems outsourcing: A survey and analysis of the literature. *The DATA BASE for Advances in Information Systems, 35*(4), 6–102.

DiRomualdo, A., & Gurbaxani, V. (1998). Strategic intent for IT outsourcing. *Sloan Management Review* (Summer), *39*, 67–80.

Friedman, T. (2005). *The world is flat: a brief history of the twenty-first century*. NY: Farrar, Straus & Giroux.

Gallivan, M. J., & Oh, W. (1999). Analyzing IT outsourcing relationships as alliances among multiple clients and vendors. *Annual International Conference on System Sciences*, *IEEE*, Hawaii, 1999.

Gartner. (2013). *Forecast analysis*: *IT outsourcing*, Worldwide.

Gopal, A., Beaubien, L., & Marcon, T. (2002). Old wolf, new wool suit: India, IT, and the legacy of colonialism. *Proceedings of the 23rd International Conference on Information Systems*, *Barcelona*, December 15–18, 2002 (pp 525–532).

Hart, S. L., & Milstein, M. B. (2003). Creating sustainable value. *Academy of Management Executive, 17*(2), 56–67.

Heeks, R., & Nicholson, B. (2004). Software export success factors and strategies in follower nations. *Competition and Change, 8*(3), 267–303.

Hirschheim, R., George, B., & Wong, S. F. (2004). Information technology outsourcing: The move towards offshoring. *Indian Journal of Economics and Business, 3*, 103–124.

Hirschheim, R. A., & Lacity, M. C. (2000). The Myths and realities of information technology insourcing. *Communications of the ACM, 43*(2), 99–107.

Howe, J. (2006). The rise of crowdsourcing. *Wired magazine, 14*(6), 1–4.

Huber, T. L., Fischer, T. A., Dibbern, J., & Hirschheim, R. (2013). A process model of complementarity and substitution of contractual and relational governance in IS outsourcing. *Journal of Management Information Systems*, *30*(3), 81–114.

Kaganer, E., Carmel, E., Hirschheim, R., & Olsen, T. (2013). Managing the human cloud. *MIT Sloan Management Review, 54*(2), 23–32.

Kaiser, K., & Hawk, S. (2004). Evolution of offshore software development: From outsourcing to co-sourcing. *MISQ Executive, 3*(3), 69–81.

Kakabadse, A., & Kakabadse, N. (2002). Trends in outsourcing: Contrasting USA and Europe. *European Management Journal, 20*(2), 189–198.

Kelly, T. (2002). A brief history of outsourcing. Global Envision.

Khan, N., Currie, W. L., Weerakkody, V., & Desai, B. (2003). Evaluating offshore IT outsourcing in India: Supplier and customer. *Proceedings of the 36th Annual Hawaii International Conference on System Sciences*, *IEEE*, 2003 (p. 10).

Kumar, K., & Willcocks, L. (1996). Offshore outsourcing: A country too far? *Proceedings of the 4th European Conference on Information Systems*, 1996 (pp. 1309–1325).

Lacity, M. C., & Hirschheim, R. A. (1993). *Information systems outsourcing: Myths, metaphors, and realities* (p. xiv, 273). Chichester, New York: Wiley.

Lacity, M. C., Hirschheim, R. A., & Willcocks, L. P. (1994). Realizing outsourcing expectations: Incredible promise, credible outcomes. *Journal of Information Systems Management, 11*(4), 7–18.

Lacity, M. C., & Willcocks, L. P. (2001). *Global information technology outsourcing*. Chichester: In Search of Business Advantage Wiley.

Linder, J. (2004). *Outsourcing for radical change*. NY: AMACOM.

Lu, B., Hirschheim, R., & Schwarz, A. (2013). Examining the antecedent factors of online microsourcing. *Information Systems Frontiers*, pp. 1–17.

Malone, T., Laubacher, R., & Dellarocas, C. (2010). The collective intelligence genome. *MIT Sloan Management Review*, *51*(3), 21–31.

Mears, J., & Bednarz, A. (2005). Take it all' outsourcing on the wane. *Computerworld*, *May 30*.

Morstead, S., & Blount, G. (2003). *Offshore ready: Strategies to plan & profit from offshore IT-enabled services*. USA: ISANI Press.

Nicholson, B., & Sahay, S. (2001). Some political and cultural implications of the globalisation of software development: Case experience from UK and India. *Information and Organisation, 11*(1), 25–43.

Obal, L. (2006). Microsourcing—using information technology to create unexpected work relationships and entrepreneurial opportunities. *Proceedings of the 2006 ACM Sigmis Cpr Conference on Computer Personnel Research: Forty Four Years of Computer Personnel Research: Achievements, Challenges & The Future*, *ACM*, 2006 (pp. 60–62).

Overby, S. (2003). The hidden costs of offshore outsourcing. *CIO Magazine*.

Pastin, M., & Harrison, J. (1974). Social Responsibility in the Hollow Corporation. *Business & Society Review*, *87*(63), 54.

PricewaterhouseCoopers. (2009). Outsourcing comes of age: The rise of collaborative partnering.

Qu, Z., & Brocklehurst, M. (2003). What will it take for China to become a competitive force in offshore outsourcing? An analysis of the role of transaction costs in supplier selection. *Journal of Information Technology, 18*, 53–67.

Rajkumar, T. M., & Dawley, D. L. (1998). Problems and issues in offshore development of software. In L. P. Willcocks & M. C. Lacity (Eds.), *Strategic sourcing of information systems*. Chichester: Wiley.

Ramanujan, S., & Lou, H. (1997). Outsourcing maintenance operations to off-shore vendors: Some lessons from the field. *Journal of Global Information Management, 5*(2), 5–15.

Rao, M. T. (2004). Key issues for global IT sourcing: Country and individual factors. *Information Systems Management* (Summer), *21*(3), 16–21.

Robinson, M., & Kalakota, R. (2004). *Offshore outsourcing: Business models, ROI and best practices*. Alpharetta: Milvar Press.

Ross, J. W., Beath, C. M., & Goodhue, D. L. (1996). Develop long-term competitiveness through IT assets. *Sloan Management Review, 38*(1), 31–42.

Rottman, J. W., & Lacity, M. C. (2004). Twenty practices for offshore sourcing. *MIS Quarterly Executive, 3*(3), 117–130.

Sabherwal, R. (1999). The role of trust in outsourced IS development projects. *Communications of the ACM, 42*(2), 80–86.

Sahay, S., Nicholson, B., & Krishna, S. (2003). *Global software work: Micro-studies across borders*. Cambridge: Cambridge University Press.

Sheshabalaya, A. (2004). *Rising elephant: The growing clash with India over white collar jobs and its challenge to America and the world*. Monroe, ME: Common Courage Press.

Smartsheet. (2009). Paid crowdsourcing: Current state and progress toward mainstream business use.

Terdiman, R. (2002). Offshore outsourcing can achieve more than cost savings. Note number: CS-16-3520, Gartner Research, 2002.

Part I
Innovation Management

Investigating the Relationship Between Outsourcing and Innovation

Benoit A. Aubert, Akie Iriyama, Ondelansek Kay and Rajiv Kishore

Abstract The linkages between outsourcing and innovation are complex. Some findings suggest that outsourcing is a way to generate increased levels of innovation. However, some recommendations extracted from the IT outsourcing literature do not seem to favor innovation through outsourcing arrangements. By understanding the different types of innovation and combining this knowledge with the IT outsourcing body of knowledge, it is possible to conjecture the potential effect of outsourcing on innovation in various circumstances.

Keywords IT outsourcing · Innovation

1 Introduction

In an increasingly computerized world, information technologies (IT) are often believed to be rewriting the rules of competition and changing the very nature of organizations. Information technologies enabled new forms of organizations, changing production modes and employment relationships (Malone 2004). Firms have to adapt to heighten competition and find new ways to innovate (Chesbrough 2003).

B.A. Aubert (✉)
Victoria University of Wellington, Wellington, New Zealand
e-mail: benoit.aubert@vuw.ac.nz

A. Iriyama
Waseda University, Tokyo, Japan

O. Kay
HEC Montreal, Montreal, QC, Canada

R. Kishore
State University of New York at Buffalo, Buffalo, NY, USA

R. Hirschheim et al. (eds.), *Information Systems Outsourcing*, Progress in IS,
DOI 10.1007/978-3-662-43820-6_2

One could think of the IT field as one in which innovation is constant. Changes happen quickly and continuously. The fast pace of change is observable when assessing the technology itself, as well as when observing the changes introduced in business. IT change the way we do business.

Perhaps surprisingly, innovation has not been a very important component in the information systems discipline. The IS literature concentrated its efforts to explain user satisfaction, usage, individual or organizational impact (Delone and McLean 2003), but left the innovation itself relatively under-studied (Yoo et al. 2010).

In the IT Outsourcing field, innovation has not been a main concern either. Most efforts in the IT outsourcing community focused on explaining the decision to outsource, the reasons behind outsourcing decisions, the outcomes of outsourcing arrangements, or the management mechanisms leading to successful outsourcing (Lacity et al. 2011).

However, other fields, notably in the innovation literature, looked at the role of outsourcing in the innovation process. Interestingly, some of the findings suggest that outsourcing is a way to generate increased levels of innovation. This might seem at odds with findings in the IT outsourcing field, which has often argued for tight contracts in low uncertainty environment—which would not be conductive of innovation.

The paper reviews and contrasts findings coming from the innovation and the IT outsourcing literatures. By understanding the different types of innovation and combining this knowledge with the IT outsourcing body of knowledge, it is possible to conjecture the potential effect of outsourcing on innovation in various circumstances. The goal is to explain the apparently conflicting elements and provide a series of propositions that would guide research on the linkages between innovation and outsourcing.

The literature review presents the main elements linking innovation to outsourcing, from the innovation and the IT outsourcing fields. Then, the characteristics of innovation—modularity, explorative or exploitative—are reviewed. These characteristics are used to develop propositions explaining the various interactions between outsourcing and innovation.

2 Literature Review

In order to understand the relationship between innovation and outsourcing, two groups of papers are reviewed. The first one comes mostly from the literature on innovation. Following this first segment, findings from the papers in the IT outsourcing literature are presented.

2.1 Looking at Outsourcing from an Innovation Perspective

A stream of literature in innovation suggests that outsourcing, and the repeated interactions between multiple partners in general, should increase innovation. This stance has also found some support in the information systems literature. The following paragraphs explain this point of view.

Traditionally, innovation was done by a sole party. The innovator assumed the risks associated with innovation, and benefited from the rewards, often through patents (Arrow 1962; Arthur 2006). The traditional model of innovation is a closed one. It could follow a linear path; ranging from the emergence of an idea until its arrival on the market in the form of a good or service. In this view, innovation may be pushed by supply and technical progress in particular (Schumpeter 1934), or it can be pulled by demand (Schmookler 1966). Innovation could also be obtained through controlled interactions. This model is based on the fact that innovation comes from the interactions between the different spheres of business, influencing each other to bring out the best possible solution (Rosenberg 1982; Kline and Rosenberg 1986). Closed innovation models are based on the idea of control. In this context, a company, if it wants to be innovative, must be able to control the process of generating new ideas, while effectively managing the functions of production, distribution, and marketing of these ideas.

Information technologies have paved the way for new approaches, which have undoubtedly changed the way to innovate. These approaches are based on the collaboration, sharing, and active participation of individuals and working groups (Tapscott and Williams 2008). In this wave of changes, outsourcing rose significantly. The organization now fits at the heart of a dynamic system where collaboration with suppliers, customers, and competition is necessary to innovate.

In this open model, organizations cannot solely rely on their internal skills. Accessing the skills of external partners is a *sine qua non* condition for the success of the innovation process, (Chesbrough 2003, 2006). These models acknowledge the fact that firms use and integrate in a systematic way both internal and external knowledge in order to innovate, and rely on internal and external distribution circuits (Von Hippel and Von Krogh 2003; Christensen et al. 2005). The boundaries of the firm are permeable. Therefore, outsourcing is one of the way to open up the innovation process and access outside ideas (Chesbrough and Kardon Crowther 2006).

These elements have important strategic implications in terms of sharing and acquiring knowledge, but also in terms of development of creative capabilities (Woodman et al. 1993; Drazin et al. 1999). The firm does not innovate alone, it uses its network of suppliers to access their knowledge (Amin and Roberts 2008). IBM is an example of such a firm. It uses a large set of alliances and outsourcing arrangements to create new products or services (Ghemawat 2007).

This open process is not without consequences. A new category of innovators made its appearance: copiers, imitators, pirates, and other hackers (Himanen 2001; Lessig 2004, 2008; Mason 2008; Anderson 2009).

Outsourcing contributed to change the sources of value. It fostered the creation of value networks, in which organizations have access to a multiplicity of information sources, and cannot control this knowledge inside their boundaries. In a sense, outsourcing contributed to the emergence of bazar of innovations (Raymond 1999). Work division has increased in the world of innovation and there is a trend toward more R&D outsourcing and alliances (Gassmann et al. 2010). This is not without consequences and these go beyond the impact on the level of innovation. For example, the improvement in the efficiency of outsourcing-targeted R&D, which increases globalization, raises the aggregate rate of innovation but at the same time it reduces the wage gap between high cost and low cost countries (Sner and Zhao 2009).

The information systems outsourcing literature investigated the collaborative aspect of innovation. While basic outsourcing is not necessarily linked with innovation, Whitley and Willcocks (2011) found that a collaborative innovation framework comprising four practices (Leading, Contracting, Organizing, and Performing) can achieve the "step-change" in outsourcing maturity that is needed to make collaborative innovation a reality.

It is difficult to assess if the innovation process changed in part because of the growth of outsourcing, or if outsourcing has grown at least in part because organizations wanted to open the innovation process. Maybe these two trends are sustaining each other. One thing seems to emerge: the organization is no longer a sole entity involved in the innovation process. It relies on the contributions of a multitude of interconnected agents (Pittaway et al. 2004; Bjork and Magnusson 2009).

2.2 IT Outsourcing Literature

In contrast to the literature looking at open innovation, the outsourcing literature is more restrained when linking outsourcing with innovation. In fact, when looking at the IT outsourcing literature, innovation does not seem to be a major research topic. Lacity et al. (2010), in a review of the IT outsourcing literature, found only one study that looked at innovation as the motivation to outsource IT services. This observation paralleled the outcomes variables identified in Dibbern et al. (2004). These were centred on cost, service performance, realization of expectations, satisfaction, and relationship quality. Innovation did not appear to be a major issue.

Noticing the scarcity of studies focusing on strategic elements, Lacity et al. (2010) suggested that it was probably not because outsourcing had no linkages with innovation or strategic intent. They suggested that this aspect of IT outsourcing might be an under investigated area. Clearly it was not the focus of IT researchers. The bulk of the research efforts were around the explanation of outsourcing decisions, or the explanation of contract outcome (Lacity et al. 2010).

This bias toward one set of outcomes might be at least in part explained by the choice of theoretical background adopted by IT researchers when investigating outsourcing. The most popular approach used to analyze IT outsourcing has been Transaction Costs Theory (Karimi-Alaghehband et al. 2011). This approach,

narrowly concentrated on the decision to outsource an activity, did not provide space to assess elements like innovation. The focus of IT outsourcing research on ITO decision (to outsource or not) or ITO outcomes (success/failure) is probably limiting the diversity of findings. Increasing the variety of elements considered, including the inclusion of additional dependent variables (for instance the level of innovation) would probably provide interesting contributions (Lacity et al. 2011).

Outsourcing has been mostly analyzed under a contracting or relationship lens, even when investigating the motivations of managers (Seddon et al. 2007). The key results obtained reflect this focus on contract and traditional contractual outcomes. For example, elements like measurability of the activities or low uncertainty have been positively linked with the likelihood of outsourcing (Aubert et al. 2012). When looking at outsourcing success (instead of the decision to outsource), process standardization, measurability, and contract completeness were associated with outsourcing success (Wüllenweber et al. 2008).

In the outsourcing literature, contracts are mostly discussed as protection mechanisms between clients and suppliers who are likely to have divergent interests. The contracts entail clauses defining monitoring, property rights protection, dispute resolution, and contingency planning (Chen and Bharadwaj 2009). These authors note that contracts typically include audits, reviews, benchmarking procedures, etc. These elements are not usually associated with innovation.

The attention given to the contractual aspect of outsourcing also led to efforts to define and understand the service level agreements (SLAs) (Goo 2010) and how SLA characteristics impacted relational outcomes (Goo et al. 2009). SLAs are a central element of the contract (and the IT outsourcing relationship) since they specify, usually in great details, the activities that will be performed by the parties. Interestingly, change attributes (one aspect that would be expected in the case of innovation) was found to be detrimental to trust and commitment in the relationship (Goo et al. 2009). This suggests a view of the outsourcing arrangements that is closer to a standardized delivery of services than an innovation-driven relationship.

Even when analyzing the strategic elements associated with IT outsourcing relationship, the focus was more on the protection of the client than on the attainment of specific objectives like innovation. For example, Barthelemy and Quelin (2006) indicated that the firms outsourcing activities that were close to their core business had to be careful and try to control the vendor as much as they could, by developing tight and precise contracts.

When trying to achieve innovation, outsourcing was looked at with caution. Willcocks et al. (2006) mention that extracting innovation from outsourcing is difficult. It requires significant in-house capabilities. It also demands strong business leadership. This suggests that outsourcing is not an easy path to innovation. This is corroborated by Levina and Vaast (2008). They observed that innovation (in a bank) came mostly from the client firm, and that managers from the bank had to provide their suppliers with the new ideas for innovation. They also noted that boundaries of various forms (power distance, organizational boundaries, and geographical boundaries) could inhibit the collaboration between parties. This would also lower innovation.

Recommendations offered to managers from research results were along similar lines. Lacity et al. (2008) indicated that outsourcing, whether it was global or not, was still more suited for non-core elements and structured activities that could be easily controlled. In a similar vein, Rottman and Lacity (2006) indicated that an efficient manner to protect intellectual property was to separate projects into a series of segments, given to different suppliers. This prevented any of them to have a clear view of all the elements associated with the activities. It is likely that it could also limit the innovation potential of the outsourcing arrangement. They also indicated that adequate knowledge transfer, when required to conduct outsourced activities, was difficult and costly.

2.3 Outsourcing as a Threat to Innovation

In addition to the contractual view, outsourcing was often analyzed with respect to the knowledge it entailed and the knowledge and capabilities required for innovation. These papers relied strongly on the Resource-based view (Espino-Rodriguez and Padron-Robaina 2006). According to this perspective, outsourcing an activity meant losing the knowledge associated with the activity. This could lower the capacity of the firm to innovate.

If one looks at the innovative capability of the organization, literature suggests that this capability is dependent on the accumulation of knowledge in the organization. This knowledge cannot be easily bought and sold (Hoecht and Trott 2006). This suggests that it has to be developed in the organization, thus making outsourcing at odds with the development of the innovative capacity of the firm when it involved IT. This view was expressed by Straub et al. (2008, p. 202): *IT-enabled competitive advantage requires continuous innovation, environmental scanning and a corporate mindset that understands the strategic use of IT. Such an environment is difficult to cultivate when control over strategic asset is handed over to an integrator or service provider.*

This suggests that while outsourcing has the potential to offer efficiency gains, it might be at the expense of innovation capacity related to the outsourced activities (Gewald and Dibbern 2009). It would explain why a negative relationship was observed between outsourcing and financial performance as product and process innovations increased (Murray et al. 1995, reported in Espino-Rodriguez and Padron-Robaina 2006).

2.4 Linking IT Outsourcing and Innovation

Combining the findings from the literature on innovation about outsourcing and the findings coming from the IT outsourcing literature raises several questions. There seems to be two different views of outsourcing, supported by different

theories. Both approaches are backed by strong empirical support. In order to understand if or how these sets of findings can be true at the same time, new investigation is required. It will demand the combination of what is known both about innovation and about contracts.

The following pages explore ways in which the relationship between IT outsourcing and innovation can be investigated. By looking at various characteristics of innovation, and by assessing contractual implications, some propositions are extracted. First, the modular or systemic character of the innovation is discussed to assess its relationship with outsourcing. Following that, the exploitative or explorative nature of innovation, and the ensuing implication for outsourcing, is discussed. Finally, additional elements linked with the type of ties established between the client and the suppliers are discussed.

2.5 Modular or Systemic Innovations

One path that might lead to an explanation of the puzzle is the type of innovation sought by the organization. Innovations can be differentiated as modular or systemic. In a modular innovation, the innovation is performed on a component of a larger product, improving this component while not affecting its interactions with the other components of the larger products. Conversely, a systemic innovation is one in which all the components at once are transformed, including how they interact (Langlois and Robertson 1992; Robertson and Langlois 1995).

A classic example of modular innovation is the type of innovation occurring constantly in the computer industry. Computers are made of standard components. The modularity of the computer architecture enables manufacturers like Intel to improve their processors or Toshiba to introduce a new hard drive while staying compatible with the other components of the computer systems (Langlois and Robertson 1992). This works well since all the interfaces are standardized. All these innovations are modular innovations.

A systemic innovation is one requiring a change in all the components associated with the product. For example, the introduction of the vinyl record required a change in all the components of the stereo system, and thus demanded the collaboration of record companies and record players manufacturers (Langlois and Robertson 1992). Systemic innovations are much more difficult to introduce because of the coordination over multiple elements they require. However, once introduced, they are likely to create a new standard. For instance, it took 50 years to replace the vinyl disk by the CD.

Modularity makes it easier to vertically disintegrate the value chain (Argyres and Bigelow 2010). In information systems, the systemic character of activities has been shown to lead to internal governance rather than outsourcing (Aubert et al. 2012; Dibbern et al. 2012). When activities are not modular, firms tend to keep them inside their boundaries.

This differentiation between modular and systemic innovation might explain why in some cases authors have argued that outsourcing could lead to less innovation, and other authors said that outsourcing could lead to more innovation.

If the innovation required is modular, it would make sense to seek specialized knowledge outside the firm to innovate on one of the component of the product or system. A supplier would have control over the activities required to introduce the innovation, as long as the interfaces with the other activities or components do not change. A company could select the most competent supplier in a field to benefit from its knowledge on an independent group of activities.

P_1: Outsourcing will increase the level of innovation in cases where the innovation is modular

If however the innovation required is systemic, outsourcing would impede innovation since it would split the control over the components between two companies, thus removing easy coordination required to change all the components at the same time.

P_2: Outsourcing will reduce the level of innovation in cases where the innovation is systemic

2.6 Exploitation or Exploration

Another way to look at innovation and outsourcing is through the exploitation—exploration lens. Innovation can be split into two types. The first one, exploitation, includes all the refinements and improvements on activities (March 1991). Typically exploitation involved applying existing capabilities in order to innovate (Tushman et al. 2010). It is an incremental type of innovation. The second type, exploration, is a more radical form of innovation. It relies on a departure from existing capabilities and the development of new ones in order to create something radically new (Tushman et al. 2010).

Considering the Resource-based view and the alleged immobility of resources (Barney 1991), it might be difficult for an organization to develop on its own the new knowledge required for explorative innovation. This would mean that an organization might use outsourcing to access new knowledge and capabilities. This approach would be in line with the open-innovation ideas stated earlier in the paper. Outsourcing an activity does not necessary mean that the organization will lose the ability to integrate this activities with the other things it does. It can retain the knowledge through its network, even when the firm is not performing all the activities in-house (Brusoni et al. 2001).

P_3: Outsourcing will facilitate the access to the knowledge and capabilities required to pursue exploration and facilitate this type of innovation

Conversely, if an organization seeks to pursue exploitative type of innovation, it is likely to have already the required knowledge and capabilities in-house to pursue these activities. In these situations, the contribution of an outsourcing partner might prove less valuable than it would be for explorative innovation, since this partner will not bring essential capabilities to the organization.

P_4: When pursuing exploitative innovation, outsourcing will not change the ability of the firm to innovate

Each organization needs to pursue at the same time exploration and exploitation. Exploration is required to guarantee the long-term survival of the firm. It is through exploration that the organization will bring new products or services to the market. At the same time, it has to perform exploitative innovation in order to ensure its short term survival. It is through exploitation that the organization generates the cash flow required for exploration (March 1991).

A challenge faced by organizations is the difficulty to manage simultaneously both types of activities. As noted by Tushman et al. (2010, p. 1336): *Exploitative subunits are organized to be efficient, while exploratory subunits are organized to experiment and improvise*. This means that different sub-units in the organization have to be managed differently. This might create several difficulties since these sub-units are likely to develop very different management practices, cultures, and be rewarded differently (Smith and Tushman 2005). In these situations, isolating the two groups of activities, for example by outsourcing one of them, is likely to facilitate the management of the remaining unit.

P_5: When an organization is pursuing both exploration and exploitation, outsourcing one group of activities (exploitation or exploration) will facilitate the management of the other group of activities

Interestingly, while the use of outsourcing for explorative innovation activities might bring benefits, this type of relationship is likely to be difficult to manage, which might lower the expected benefits of outsourcing for these types of activities. As March (1991, p. 75) mentions, *The search for new ideas, markets, or relations has less certain outcomes, longer time horizons, and more diffuse effects than does further development of existing ones.* When one looks at the contract view of outsourcing described earlier, the ideal activities to outsource are measurable and involve low uncertainty. This description (measurable and certain) fits exploitation activities, not exploration activities. This would suggest that outsourcing exploration activities might generate more contractual difficulties than outsourcing exploitation activities.

P_6: The outsourcing of exploration activities will generate more contractual difficulties than outsourcing of exploitation activities

This would mean that the benefits extracted from outsourcing in the case of explorative innovation might be offset by the contractual difficulties associated with the contractual elements of the relationship.

2.7 Weak Ties and Strong Ties

Finally, a third set of considerations that need to be addressed when looking at the linkages between outsourcing and innovation is the nature of the ties between the client and its suppliers. Clients can have long-term relationships with suppliers, developed through renewed contracts, or they can seek new suppliers. The type of innovation that is more likely to be generated might depend on the client's selection strategy when deciding which supplier to work with.

The choice between a new supplier and a supplier with which the firm had a series of previous interactions is not without consequences. Choosing a new supplier would mean transacting with a supplier with which the firm has weak ties. Picking a supplier with which the firm has a long history of collaboration would mean transacting with one with which the firm has already strong ties.

Weak ties indicate low commitment and infrequent contact between parties (Granovetter 1973). Weak ties are expected to carry information that is less redundant than information coming from partners with whom the firm has strong ties (Granovetter 1973). New information is likely to come from parties that are met less frequently (Gilsing and Nooteboom 2005).

This would suggest that in order to make explorative innovation, when seeking new capabilities, weak ties would be more likely to bring the required new knowledge and capabilities (Gisling and Nooteboom 2005). These authors also suggest that exploration would require multiple of information sources, which would enable triangulation and comparison of different information. This would suggest a series of propositions.

P_7: In order to achieve exploration type of innovation, the client would be better to select a new supplier, with which it has no existing relationship, than an existing one

P_8: In order to achieve exploration type of innovation, the client would be better to select multiple suppliers rather than contracting with a single one

In the case of exploitation, the need for new information is less important than it is for exploration since exploitation seeks to innovate incrementally using the same knowledge-base and existing capability. Therefore, it is likely that the costs incurred for the search for new suppliers, and the transaction costs associated with contracting multiple ones, would offset the (low) benefits associated with the new information new suppliers would provide.

P_9: In the case of exploitation, the value of the new information generated by the use of new and multiple suppliers would be lower than the transaction costs generated by such a sourcing strategy

Table 1 Summary of Influences

	Impact of outsourcing on		Suggested contracting strategy to increase innovation	Impact of outsourcing on innovation/ modularity	
	Level of innovation	Contractual difficulties		Modular	Systemic
Exploration	+	+	*Multiple new suppliers in flexible contract*	+	−
Exploitation	=	−	*Single supplier in tight contract*	+	−

3 Discussion and Conclusion

The various propositions illustrate the fact that the relationship between outsourcing and innovation is a complex one. It is difficult to argue that a simple question like "Does outsourcing increases the level of innovation?" make sense. The answer, in classic academic fashion, would be "it depends". However, by examining the various sources of literature, it is possible to guess on which elements it depends.

Table 1 summarizes the main influences extracted in the forms of propositions. By looking at the table, it seems clear that the relationship between outsourcing and innovation is complex and multi-layered. For each type of innovation, we can observe that some effects are positive, while others are negative. It is difficult to guess what the net effect would be.

For example, if we outsourced an activity linked with explorative innovation, the simultaneous effects would be:

- An increased level of innovation coming from the new ideas provided by the suppliers
  - This increased effect is expected with the caveat that the suppliers chosen are ones with which the company was not already dealing with (and ideally multiples suppliers)
  - The increased effect is also more likely to be observed if the innovation is modular. If it were a systemic innovation, it would mean that even if the ideas are collected, they would be difficult to implement.
- This increased level of innovation would be accompanied with increased contractual difficulties.

This clearly shows that the relationship between innovation and outsourcing is a complex one. It suggests limits to the idea of open innovation and stronger externalization to foster innovation. While it might be a good approach in some cases, it might be detrimental in other instances.

Implementing IT and taking advantage of IT to innovate is likely to remain a key survival tool for organizations. Because of the complexity of the IT field, IT suppliers will remain an important source of knowledge and capabilities for client companies. It will be important to understand how to take advantage of these capabilities in the best possible way in order to innovate. Future research efforts on innovation and outsourcing could dissect the types of innovations, and test the propositions offered in the paper. This would provide an interesting contribution for managers, and enrich our understanding of the outsourcing phenomenon.

References

Amin, A., & Roberts, J. (2008). *Community, economic creativity and organization*. Oxford: Oxford University Press.

Anderson, C. (2009). *Free: The future of a radical price*. New York: Hyperion.

Argyres, N., & Bigelow, L. (2010). Innovation, modularity, and vertical deintegration: Evidence from the early US auto industry. *Organization Science, 21*(4), 842–853.

Arrow, K. J. (1962). Economic welfare and the allocation of resources for creation. In *The rate and direction of inventive activity: economic and social factors* (pp. 609–625). Princeton University Press.

Arthur, W. B. (2006). The structure of invention. *Research Policy, 36*(2), 274–287.

Aubert, B. A., Houde, J. F., Patry, M., & Rivard, S. (2012). A multi-level investigation of information technology outsourcing. *The Journal of Strategic Information Systems, 21*, 233–244.

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*(1), 99–120.

Barthélemy, J., & Quelin, B. V. (2006). Complexity of outsourcing contracts and ex post transaction costs: An empirical investigation. *Journal of Management Studies, 43*(8), 1775–1797.

Bjork, J., & Magnusson, M. (2009). Where do good innovation ideas come from? Exploring the influence of network connectivity on innovation idea quality. *Journal of Production and Innovation Management, 26*, 662–670.

Brusoni, S., Prencipe, A., & Pavitt, K. (2001). Knowledge specialization, organizational coupling, and the boundaries of the firm: Why do firms know more than they make? *Administrative Science Quarterly, 46*(4), 597–621.

Chen, Y., & Bharadwaj, A. (2009). An empirical analysis of contract structures in IT outsourcing. *Information Systems Research, 20*(4), 484–506.

Chesbrough, H. (2003). *Open innovation: the new imperative for creating and profiting from technology*. Boston: Harvard Business School Press.

Chesbrough, H. (2006). *Open business models: how to thrive in the new innovation landscape*. Boston: Harvard Business School Press.

Chesbrough, H., & Kardon Crowther, A. (2006). Beyond high tech: Early adopters of open innovation in other industries. *R&D Management, 36*(3), 229–236.

Christensen, J. F., Olesen, M. H., & Kjær, J. S. (2005). The industrial dynamics of open innovation: Evidence from the transformation of consumer electronics. *Research Policy, 34*(10), 1533–1549.

Delone, W. H., & McLean, E. (2003). The DeLone and McLean model of information systems success: A ten-year update. *Journal of management information systems, 19*(4), 9–30.

Dibbern, J., Chin, W. W., & Heinzl, A. (2012). Systemic determinants of the information systems outsourcing decision: A comparative study of German and United States firms. *Journal of the Association for Information Systems, 13*(6), 466–497.

Dibbern, J., Goles, T., Hirschheim, R., & Jayatilaka, B. (2004). Information systems outsourcing: A survey and analysis of the literature. *ACM SIGMIS Database, 35*(4), 6–102.

Drazin, R., Glynn, M. A., & Kazanjian, R. K. (1999). Multilevel theorizing about creativity in organizations: A sensemaking perspective. *The Academy of Management Review, 24*(2), 286–307.

Espino-Rodríguez, T. F., & Padrón-Robaina, V. (2006). A review of outsourcing from the resource-based view of the firm. *International Journal of Management Reviews*, *8*(1), 49–70.

Gassmann, Oliver, Enkel, Ellen, & Chesbrough, Henry. (2010). The future of open innovation. *R&D Management, 40*(3), 213–221.

Gewald, H., & Dibbern, J. (2009). Risks and benefits of business process outsourcing: A study of transaction services in the German banking industry. *Information and Management, 46*(4), 249–257.

Ghemawat, P. (2007). Managing differences: The central challenge of global strategy. *Harvard Business Review, 85*, 58–68.

Gilsing, V., & Nooteboom, B. (2005). Density and strength of ties in innovation networks: An analysis of multimedia and biotechnology. *European Management Review, 3*(2), 179–197.

Goo, J. (2010). Structure of service level agreements (SLA) In IT outsourcing: The construct and its measurement. *Information Systems Frontiers, 12*(2), 185–205.

Goo, J., Kishore, R., Rao, H. R., & Nam, K. (2009). The role of service level agreements in relational management of information technology outsourcing: An empirical study. *MIS Quarterly, 33*(1), 119.

Granovetter, M. (1973). The strength of weak ties. *American Journal of Sociology, 78*(6), 1360–1380.

Himanen, P. (2001). *The hacker ethic and the spirit of the information age*. New York: Random House Inc.

Hoecht, A., & Trott, P. (2006). Innovation risks of strategic outsourcing. *Technovation, 26*(5), 672-681.

Karimi-Alaghehband, F., Rivard, S., Wu, S., & Goyette, S. (2011). An assessment of the use of transaction cost theory in information technology outsourcing. *The Journal of Strategic Information Systems, 20*(2), 125–138.

Kline, S., & Rosenberg, N. (1986). An overview of innovation. In Landau, R., & Rosenberg, N. (Eds.), *The positive sum strategy* (pp. 275–305). National Academy Press, Washington.

Lacity, M. C., Khan, S., Yan, A., & Willcocks, L. P. (2010). A review of the IT outsourcing empirical literature and future research directions. *Journal of Information Technology, 25*(4), 395–433.

Lacity, M. C., Willcocks, L. P., & Khan, S. (2011). Beyond transaction cost economics: Towards an endogenous theory of information technology outsourcing. *The Journal of Strategic Information Systems, 20*(2), 139–157.

Langlois, R. N., & Robertson, P. L. (1992). Networks and innovation in a modular system: Lessons from the microcomputer and stereo component industries. *Research Policy, 21*(4), 297–313.

Lacity, M. C., Willcocks, L. P., & Rottman, J. W. (2008). Global outsourcing of back office services: Lessons, trends, and enduring challenges. *Strategic Outsourcing: An International Journal, 1*(1), 13–34.

Lessig, L. (2004). *Free culture: the nature and future of creativity*. New York: Penguin Press.

Lessig, L. (2008). *Remix: making art and commerce thrive in a hybrid economy*. New York: Penguin Press.

Levina, N., & Vaast, E. (2008). Innovating or doing as told? Status differences and overlapping boundaries in offshore collaboration. *MIS Quarterly, 32*(2), 307–332.

Malone, T. W. (2004). *The future of work: How the new order of business will shape your organization, your management style, and your life*. Harvard Business School Press. March, J. G.

(1991). Exploration and exploitation in organizational learning. *Organization Science, 2*(1), 71–87.

March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science, 2*(1), 71–87.

Mason, M. (2008). *The pirate's dilemma*. New York: Free Press.

Murray, J. Y., Kotabe, M., & Wildt, A. R. (1995). Strategic and financial performance implications of global sourcing strategy: A contingency analysis. Journal of International Business Studies, 181-202.

Pittaway, L., Robertson, M., Munir, K., Denyer, D. A., & Neely, A. (2004). Networking and innovation: A systematic review of the evidence. *International Journal of Management Reviews*, *5/6*(3/4), 137–168.

Raymond, E. S. (1999). *The cathedral and the bazaar—musings on linux and open source by an accidental revolutionary*. Sebastopol: O'Reilly Media.

Robertson, P. L., & Langlois, R. N. (1995). Innovation, networks, and vertical integration. *Research Policy, 24*(4), 543–562.

Rosenberg, N. (1982). *Inside the black box: technology and economics*. Cambridge: Cambridge University Press.

Rottman, J. W. & Lacity, M. C., (2006). Proven practices for effectively offshoring IT work. *MIT Sloan Management Review*, *47*(3), 56–63.

Schmookler, J. (1966). *Invention and economic growth*. Cambridge: Harvard University Press.

Schumpeter, J. A. (1934). *The theory of economic development*. Cambridge: Harvard University Press.

Seddon, P. B., Cullen, S., & Willcocks, L. P. (2007). Does Domberger's theory of 'the contracting organization' explain why organizations outsource IT and the levels of satisfaction achieved? *European Journal of Information Systems, 16*(3), 237–253.

Smith, W. K., & Tushman, M. L. (2005). Managing strategic contradictions: A top management model for managing innovation streams. *Organization Science, 16*(5), 522–536.

Sner, F., & Zhao, L. (2009). Globalization, R&D and the iPod cycle. *Journal of International Economics, 77*(1), 101–108.

Straub, D., Weill, P., & Schwaig, K. S. (2008). Strategic dependence on the IT resource and outsourcing: A test of the strategic control model. *Information Systems Frontiers, 10*(2), 195–210.

Tapscott, D., & Williams, A. D. (2008). *Wikinomics: how mass collaboration changes everything*. New York: Portfolio.

Tushman, M., Smith, W. K., Wood, R. C., Westerman, G., & O'Reilly, C. (2010). Organizational designs and innovation streams. *Industrial and Corporate Change, 19*(5), 1331–1366.

Von Hippel, E., & Von Krogh, G. (2003). Open source software and the 'privatecollective' innovation model: Issues for organization science. *Organization Science, 14*(2), 209–223.

Whitley, Edgar A., & Willcocks, Leslie P. (2011). Achieving step-change in outsourcing maturity: Toward collaborative innovation. *MIS Quarterly Executive, 10*(3), 95–109.

Willcocks, L., Feeny, D., & Olson, N. (2006). Implementing core IS capabilities: Feeny-Willcocks IT governance and management framework revisited. *European Management Journal, 24*(1), 28–37.

Woodman, R. W., Sawyer, J. E., & Griffin, R. W. (1993). Toward a theory of organizational creativity. *The Academy of Management Review, 18*(2), 293–321.

Wüllenweber, K., Beimborn, D., Weitzel, T., & König, W. (2008). The impact of process standardization on business process outsourcing success. *Information Systems Frontiers, 10*(2), 211–224.

Yoo, Y., Henfridsson, O., & Lyytinen, K. (2010). The new organizing logic of digital innovation: An agenda for information systems research. *Information Systems Research, 21*(4), 724–735.

Strange Bedfellows No More: Researching Business Process Outsourcing and Dynamic Innovation

Mary C. Lacity and Leslie P. Willcocks

Abstract This chapter answers the question: How do clients and BPO service providers work together to foster dynamic innovation? The chapter is based on research conducted in 2011 and 2012 and includes 202 survey responses and 48 in-depth interviews in 24 client organizations. Dynamic Innovation is a process by which clients incent providers to deliver many innovations each year that improve the client's performance in terms of operational efficiency, process effectiveness and/or strategic impact. The research finds that leadership pairs are key drivers of dynamic innovation. Leadership pairs jumpstart the dynamic innovation process by starting with innovation incentives. The most effective innovation incentives are mandatory productivity targets, innovation days, and gainsharing at the project level. Threat of competition and special governance arrangements for innovation also positively influence innovation. The least successful incentives for innovations were found to be innovation funds, gainsharing at the relationship level, what has been called 'painsharing', and benchmarking. Delivering innovations requires acculturation that is, establishing a collaborative culture. This acts as a foundation for practices that inspire, fund, and inject cycles of innovations in the client organization.

Keywords Innovation · Business process outsourcing · Transformational leadership

M.C. Lacity (✉)
College of Business, University of Missouri-St. Louis, One University Boulevard, St. Louis, MO 63121, USA
e-mail: Mary.Lacity@umsl.edu
URL: http://www.umsl.edu/~lacitym

L.P. Willcocks
Department of Management, Information Systems and Innovation Group, London School of Economics and Political Science, Houghton Street, London WC2A 2AE, UK
e-mail: l.p.willcocks@lse.ac.uk

R. Hirschheim et al. (eds.), *Information Systems Outsourcing*, Progress in IS,
DOI 10.1007/978-3-662-43820-6_3

1 Introduction

On conservative estimates, looking across a range of reports and studies, global Information Technology Outsourcing (ITO) revenues will probably exceed $US 290 billion in 2012. With Business Process Outsourcing (BPO) revenues exceeding $US 175 billion in the same year, and offshore outsourcing representing more than $US85 billion of these combined revenue figures, it is very clear that, with its 20 year plus history, outsourcing of IT and business services is becoming an almost routine part of management, representing for many major corporations and government agencies the greater percentage of their back office expenditures.[1] In 2012, Fortune 500 companies had only outsourced $68 billion of their $1.3 trillion non-core cost base,[2] but will undoubtedly outsource more. All projections we have looked at or made suggest continued growth over the 2012–2016 period. Our own synthesis of the reports from Everest, Gartner, NASSCOM, and IDC suggests that ITO global growth will be in the range of 5–8 % per annum, with business process outsourcing rising by 8–12 % per annum, and, subsumed within these, offshore outsourcing growing at an even faster annual rate. Client organizations continue to have a strong appetite for contracting with domestic, offshore, and global BPO providers, and offshoring remains strong despite anti-offshoring pressures in developed countries.[3]

With this strong appetite, however, comes a shifting set of demands. The present generation of BPO clients expects more from BPO service providers than upfront cost savings and "green" service levels (Lacity and Willcocks 2012). They also expect longer-term results than one-time, big-bang "transformational" efforts (Linder 2004) that proved to be quite risky. However, historically innovation and IT/BP outsourcing have been rare bedfellows. There is a great deal of research, including our own, to show that the key disappointments between 1989 and 2011 were twofold: variable quality of relationships, and all too little innovation experienced (Lacity and Willcocks 2009; Lacity and Willcocks 2012). This has translated into good-to-strong success where limited objectives were pursued, but a

[1] See Willcocks, L. Lacity, M. and Craig, A. (2012). *Becoming Strategic—South Africa's BPO Service Advantage*. LSE Outsourcing Unit Research Paper 12/3, LSE, London. This should be compared with a more optimistic forecast of J. Harris, K. Hale, R. Brown, A. Young and C. Morikawa, "Outsourcing Worldwide: Forecast Database." Gartner, September 13, 2010. http://www.gartner.com/id=486175. They suggested a market of $309 billion revenues in 2012.

[2] Willcocks, Lacity and Craig (2012) op. cit. See also IDC, 2012 BPO Market Size, http://www.idc.com.

[3] In fourth quarter 2011, we administered a survey to respondents representing 84 client organizations that purchase ITO and BPO services. Nine countries are represented, but the data primarily capture US client responses. Overall, we found that client organizations are not changing their buying patterns because of anti-offshoring pressures. Instead, client respondents report strong satisfaction with offshore outsourcing of IT and business services and favorably reported on the costs savings and increased flexibility with offshore ITO and BPO. See: S. Khan, and M. Lacity, "Survey Results: Are Client Organizations Responding to Anti-Offshoring Pressures?" Strategic Outsourcing: An International Journal, Vol. 5, 2, (2012) 166–179.

patchy record where more transformative, multiple objectives have been attempted. This is the background for our own estimates for BPO that 20 % are high performance arrangements, 25 % good, 40 % 'doing OK' and 15 % poor performing relationships.[4]

Not surprisingly, many client organizations find this situation unsatisfactory. As the business process outsourcing (BPO) market matures, clients are expecting BPO outcomes beyond cost savings and meeting service level agreements. Next-generation BPO clients, we are finding, want their service partners to transform their back offices, improve business performance, nimbly enable the client's shifting business directions, and deliver business outcomes that were not initially expected. This means that 'innovation' is very much on the agenda. But relatively few BPO relationships are set up to achieve innovation, however defined. The relationships that are achieving these exceptional results we call high-performing BPO relationships. What practices distinguish high-performing BPO relationships from "typical" BPO relationships? Our research reveals that "dynamic innovation" is a theme that significantly distinguishes high-performing BPO relationships from typical performing relationships. The theme of dynamic innovation emerged from a number of research streams, including in-depth interviews with client-provider executive pairs in 24 organizations, an innovation survey of 202 outsourcing executives, and our prior BPO case study research.[5]

---

[4] The estimates come from reviewing our high performance case research for 2012/2013 and considering also the following studies. Our most comprehensive data comes from Lacity et al., (2012) *op.cit.* which reviews 1,356 findings from 254 academic research studies. Most of this research is based on large-sample surveys of outsourcing clients or in-depth case studies at client sites. Many academic studies examined specifically the extent to which outsourcing engagements resulted in positive outcomes from the client's perspective. Aggregating results across all BPO empirical studies reveals that BPO clients reported positive outcomes from outsourcing business processes 56 % of the time, negative outcomes 11 % of the time, and no changes in performance as a consequence of outsourcing business processes 33 % of the time. (ITO clients, by comparison, reported positive outcomes from outsourcing 63 % of the time.) A further source is Willcocks, L. Lacity, M., Simonsen, E., Sutherland, C., Hindle, J and Mindrum, C. (2012), *Achieving High Performance in BPO: Research Report*. Accenture, London. The BPO survey conducted by Everest Group in this research identified 20 percent of respondents as "best-in-class" scoring strongly on at least three must-have attributes, and in the top quartile on seven additional attributes. A further 20 percent were "potential" high performers meeting one or other of these two criteria; 60 % were typical BPO performers meeting neither criteria. Note that typical here covers a wide spectrum of performance from normal to poor. The research found that levels of performance were independent of industry, geography, size of deal, tenure of BPO relationship and business function outsourced.

[5] We have been conducting BPO case studies since 2000. Some of our first BPO case studies are published in Willcocks, L., and Lacity, M. (2006), *Global Sourcing of Business and IT Services*, Palgrave, United Kingdom. Our most recent BPO work is found in: Lacity, M., and Willcocks, L. (2012), *Advanced Outsourcing Practice: Rethinking ITO, BPO, and Cloud Services*, Palgrave, London. We also use the data from a 26 organizations study of outsourcing and collaborative innovation. See Whitley, E. and Willcocks, L. (2011) "Achieving Step-Change in Outsourcing Maturity: Towards Collaborative Innovation," *MISQ Executive*, Vol. 10, 3, 95–107.

Our latest research on BPO relationships finds that clients increasingly expect their service providers to innovate constantly. In high-performing BPO relationships, multiple innovation projects deliver substantial improvements to the client's performance. Such results are not automatic outcomes from outsourcing. Specifically, clients must motivate BPO providers with incentives and both parties must nurture a collaborative culture that inspires, funds, and injects cycles of innovations in the client organization. The entire process can be termed dynamic innovation.Dynamic innovation is characterized by continuous, energetic, and sustained efforts that improve the client's operational efficiency, process effectiveness and/or strategic performance. Dynamic innovation differs from static views on innovation that tend to evaluate single innovations based on size of impact, such as incremental (small change), radical (large change), or revolutionary (game changing) or by level of impact, such as IT operational level, business process level, or strategic level (Davenport et al. 2006; McKeown 2008; Weeks and Feeny 2008). In one case study based on our current research, for example, the client and provider have completed 53 continuous improvement projects that delivered bottom line results including cost savings, faster product delivery times, and higher fulfillment rates. A static view of innovation would call each innovation incremental, but a dynamic view of innovation assesses how year-on-year programs of change accumulate to radically improve the client's performance.

How can clients and BPO service providers work together to foster dynamic innovation? In this chapter, we explain how high-performing BPO relationships dynamically innovate. We look at sample innovations, the role of the leadership pair, incenting and contracting for innovation, and how innovations are delivered. We also assess the management implications of our findings. We begin by reviewing the outsourcing innovation literature.

2 Prior Outsourcing Research on Innovation

In the context of ITO and BPO, innovation has been studied as either an independent or dependent variable. As an independent variable, researchers have examined, to a limited extent, innovation as a motivation for or driver of outsourcing decisions. As a dependent variable, researchers have examined innovation effects, i.e., the consequences of outsourcing on innovation (Lacity et al. 2010, 2011).

2.1 Innovation as Outsourcing Driver

Lacity et al. (2010) reviewed 164 empirical ITO articles published between 1992 and 2010 in 50 journals and Lacity et al. (2011) reviewed 87 empirical BPO articles published between 1996 and 2011 in 67 journals. Academic research that

investigated outsourcing drivers found that clients mostly outsource information technology and business process services for operational reasons—to reduce costs, improve process performance, access skills, increase scalability and/or speed delivery. Among the list of 20 motives for ITO and BPO academics have studied, strategic motives had only been examined a few times. Specifically, commercial exploitation was studied twice in relation to outsourcing decision (DiRomualdo and Gurbaxani 1998; Kishore et al. 2004), access to global markets was examined five times (e.g., Sobol and Apte 1995; Rao et al. 2006; Beverakis et al. 2009) and innovation was examined three times as a motive for outsourcing (e.g., Quinn 2000). In the ITO and BPO reviews, Lacity et al. (2010, 2011) concluded that researchers under-examined the more strategic drivers of outsourcing, including innovation.

2.2 Innovation Effects

In the BPO review, innovation effects were examined 20 times, but the context was always research and development (Lacity et al. 2011). These studies are quite good at looking at the innovation effects of outsourcing R&D. The dependent variable was operationalized most frequently using number of patents filed or granted and changes in sales or profitability (e.g., Ciravegna and Maielli 2011; Lucena 2011; Mihalache et al. 2012; Nieto and Rodríguez 2011; Weigelt and Sarkar 2012). For example, Grimpe and Kaiser (2010) found a u-shaped relationship between degree of outsourcing R&D and innovation performance measured as share of sales from new products. They found that outsourcing improved innovation performance up to a point, then too much outsourcing actually hurt innovation performance. Beyond R&D, BPO and ITO researchers could help practice by studying further how clients can get innovation from outsourcing.

In addition to the reviews by Lacity et al. (2010, 2011) for ITO and BPO services, Stanko and Calantone (2011) reviewed all the empirical literature from the more mature research area of outsourcing the development of new physical *products*, such as new pharmaceuticals. They concluded, *There has been scant research into the performance implications of outsourcing innovation activities, although this literature is growing of late. Researchers simply have not yet answered many of the questions managers of innovation-seeking organizations face. Some of these outstanding questions include better understanding the impact of outsourcing on a variety of relevant metrics such as new product development speed, quality and profit.*

In 2013, we again searched the academic literature for empirical studies on ITO and BPO. Researchers are clearly beginning to address the gaps in knowledge. Authors have published recently insightful case studies in on innovation and outsourcing in the private (e.g., Babin and Schuster 2012; Weeks and Thomason 2011) and public sectors (e.g., Moon et al. 2010). Surveys continue to track trends

(e.g., Massini and Miozzo 2012). Researchers also are examining contractual and relational governance practices and collaborative processes that help deliver innovation from ITO and BPO (e.g., Oshri et al. 2012; Whitley and Willcocks 2011). Academics are also spawning helpful debates (Datta and Bhattacharya 2012; Oshri 2012). Researchers are also studying niche areas, such as outsourcing and innovation in small firms (e.g., Hatonen 2010) and in certain countries besides India and China (Uriona-Maldonado et al. 2010). To further contribute to the knowledge on innovation in BPO services, we undertook a research project, which is described next.

3 Research Method

Our initial research question was "Which attitudes, behaviors, processes and practices distinguish BPO relationships with great performance from BPO relationships with "poor" or "good" performance?" Interviews were deemed an appropriate method to answer this question for several reasons. First, we sought to understand the participant's own perspectives (Kvale 1996)—would clients and providers have similar or different perceptions (Klein and Myers 1999)? Second, we did do not want to limit the study to pre-defined constructs or predefined categories within constructs (Glaser and Strauss 1999). Although we had a detailed interview guide (explained below), we wanted a method that would allow additional themes or constructs to emerge from the interviews (and indeed they did). Additionally, interviews are also appropriate when seeking participation from busy or high-status respondents (Mahoney 1997), when seeking answers to questions in which the subject matter is sensitive (Mahoney 1997), when researchers are more concerned with the quality, not quantity of responses (Fontana and Frey 1994), and when seeking answers to why or how questions about contemporary events over which the researcher has little or no control (Fontana and Frey 1994; Yin 2003).

Interview Guide. We designed two interview guides, one for the client participants and one for the provider participants. The interview guides were designed to capture current research on the attitudes, behaviors, processes and practices that affect outsourcing outcomes. For client participants, the guides have open-ended questions on outsourcing strategy, provider selection, contractual governance, transition of work, ongoing delivery, relational governance, outsourcing outcomes, client and provider capabilities, client and provider behaviors, and overall lessons learned. The provider guide included the same set of questions for contractual governance, transition of work, ongoing delivery, relational governance, outsourcing outcomes, client and provider capabilities, client and provider behaviors, and overall lessons learned. Research sponsors reviewed the guides for clarity and understandability.

Interviewees. Through research sponsored by the Outsourcing Unit at the London School of Economics and Political Science in association with Accenture, Orbys, and Business Process Enabling South Africa (BPeSA), we conducted 48

in-depth interviews between October 2011 and December 2012 with BPO client-provider executive pairs (interviewed separately) in 24 client companies. The sample was drawn from across sectors and countries with the guidance and facilitation of the research sponsors. The BPO relationships ranged in size from small (equal to 5 Full Time Equivalents (FTE)) to very large (equal to 550 FTEs). The BPO relationships covered financial and accounting services (n = 8 relationships), human resource management (n = 3 relationships), procurement (n = 3 relationships), supply chain services (n = 2 relationships), call centers (n = 4 relationships), and legal services (n = 4 relationships). Participants were interviewed by phone because they were globally dispersed; participants are located in Australia, Canada, India, Ireland, the Philippines, Spain, South Africa, Switzerland, Czech Republic, United Kingdom, and the United States. Interviews last between 45 and 75 min. All interviews were tape recorded and transcribed. All participants were guaranteed anonymity to promote open and frank discussions.

Innovation Survey. The intention of the survey was to capture the similarities and differences between client and provider perceptions about the definition of outsourcing, the most effective innovation incentives, sources and funding for innovations, and samples of innovations delivered in outsourcing relationships. The survey was designed by the lead author and reviewed by members of the International Association of Outsourcing Professionals (IAOP). The survey was administered at the IAOP's 2012 Outsourcing World Summit. At the World Summit, clients gathered in one ballroom (identity was verified at the entrance) and providers and advisors gathered in another ballroom for networking sessions. Mid-way through each session, participants were asked to fill in our chapter survey. 202 delegates turned in completed surveys—85 clients, 90 providers and 27 outsourcing advisors (Lacity and Rottman 2012).

Data Analysis—Theme of Dynamic Innovation. The transcribed interviews are over 500 pages long. First, we extracted and wrote chapters on eight best practices tied to performance, which were based on the initial set of constructs designed in the guides.[6] As we were writing these first chapters, we became aware of the strong theme of innovation emerging from the interviews. We read through the transcripts multiple times to focus solely on innovation. We began to categorize sub-themes, including the most effective innovation incentives, the least effective innovation incentives, the processes used to delivery innovations in client organizations, and the effects of innovation on client performance. We also compared and contrasted the emerging innovation themes with the survey responses. We used both data sources to create the Dynamic Innovation Framework presented in this chapter. Participants quoted in this chapter were asked to review the chapter for their comments, feedback, and permission to cite

[6] The eight practices are available Accenture (2012) *Achieving High Performance in BPO: Research Report*. Accenture, London available at http://www.accenture.com/Microsites/highperfbpo/Pages/home.aspx.

anonymous quotes. All participants gave positive feedback on the framework (although many requested minor tweaks to their direct quotes).

Before explaining the Dynamic Innovation Framework in detail, we first set the context by explaining how participants define innovation and to give some illustrative examples of innovations delivered in BPO relationships.

4 Innovations: Definitions and Examples

Academics often define innovation as an idea, practice, or object that is *perceived* as new by an individual or organization (Rogers 2006). Wright (2012) argues innovation should be defined as an if-then argument. But what do practitioners mean by the term "innovation" in the context of BPO relationships? In earlier research we found clients defining innovation as 'doing things differently for the better,' and 'realizing there is a different and better way of doing something, and combining this with the ability to deliver' (Willcocks et al. 2011). Based on our recent in-depth interviews with BPO client-provider executive pairs, clients and providers define innovation by their own test: an innovation is any activity that improves the client's performance. Our survey of 202 outsourcing professionals found the same result. The top ranked definition of innovation by clients, providers and advisors was *something that improves the customer's services or costs, regardless of its novelty*.

What do innovation "activities" comprise? Throughout our interviews and survey, we asked practitioners to provide specific examples of innovations and how those innovations improved client performance. Although dynamic innovation is a sustained process over time, it is still interesting to learn about specific innovations, even in isolation from a more integrative innovation agenda.

In the innovation survey, we asked respondents to briefly describe a successfully implemented innovation. We coded the 85 responses into eight categories (see Fig. 1). The most common type of innovation was a new tool or technology (35 %), such as a new customer tracking tool, asset management tool, e-invoicing tool, optical character recognition tool, and migration to the cloud. New or improved processes (16 %) were the second most common types of innovation. Respondents described new or improved processes to evaluate sales force effectiveness, to assess asset value, and to train new workers, for example. Thirteen percent of the innovations were unique, so we categorized these as "other". Examples included establishing a center of excellence and restructuring a back office. Automation was the fourth largest category, describing 12 % of the innovations.

Respondents also pointed to the significant consequences of innovations to the client's improved performance. One respondent described a report delivery innovation that reduced turnaround time from 20 h to 20 min. Another respondent described a workflow automation system that reduced the client's costs by 50 %. Another respondent wrote about a chapter clearinghouse solution the provider

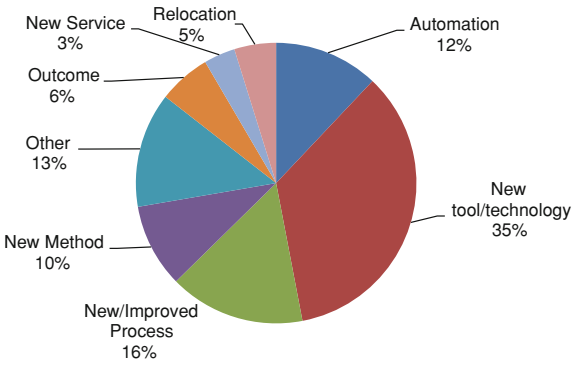


Fig. 1 Categories of Innovations (n = 85)

developed to allow electronic claims that previously could only be submitted via chapter submission. The automation reduced costs and improved timeliness of claims submissions.

From the interviews, we collected multiple examples of innovations from each BPO relationship. Unlike the survey, it was difficult to categorize the case study innovations as strictly a technology, process, method, or automated innovation. In reality, most innovations are more complex and include a mix of technologies, processes, *and* methods as demonstrated in the next examples.

Moving to the Cloud. On one procurement deal for an electronic design automation client, the provider moved the client's procurement platform to the cloud. Cloud delivery lowered the client's costs and sped their access to upgrades. The provider explains, *One of the biggest innovations recently is moving the client to this on-demand platform. And as a result, they now see regular innovation because, given that it's in the cloud, updates are made to that software and new configurations and capabilities are implemented through that cloud configuration. The client would have had to pay a consultant to come in and hardwire their CD version. So that's certainly helping them innovate from a technology standpoint.* While one might conclude that this is strictly a *technical* innovation, in reality the *method* for upgrades changed and the *service* changed because the client had to sacrifice customization to realize benefits from the one-to-many cloud computing platform.

Electronic Invoicing. On another BPO account for FAO services at a high tech company, the provider had already reached 100 % on their service levels for processing invoices and had reduced costs through labor arbitrage and process standardization. The provider account delivery manager began to think: Did the client really care that the provider meets the monthly SLA to post all the invoices within three days? No, the client cares about further reducing the costs per invoice. The provider identified electronic invoicing as the best way to reduce costs, *We proposed to implement electronic invoicing and OCR*[7] *as a project. So that's an*

[7] OCR = Optical Character Recognition.

innovation that we've brought forward. That particular project is all about focusing on the business outcome that you want to achieve. And then to achieve that outcome, it's specific innovations around electronic invoicing and OCR. So focusing on the outcome first and then saying, how can we drive that? Electronic invoicing will reduce the provider's headcount, and thus their revenue, but the provider is incented to do so through gainsharing. This innovation involves new technology, new processes, and new methods.

Better Forecasting. On one BPO account for an aircraft engine manufacturer, the provider implemented innovations that delivered bottom line results. The provider deployed a better forecasting tool for supplies and proposed a new key process indicator—supplier promise delivery date fulfillment. The innovations used new tools, techniques, and methods. These innovations helped the client improve the customer order fill rates for new parts from 60 to 85 % and the turn around time for delivering parts to grounded aircraft from 21 to 17 h.

Faster Product Delivery. One hi-tech manufacturer outsourced the posting of purchase orders to a BPO provider. The provider's tasks included taking and booking customer orders that were then handed over to the client's accountants for processing. It was taking the manufacturer, on average, 20 days to deliver product to their customers. Their competitors delivered within 10 days, a significant competitive advantage. The provider analyzed the end-to-end process and determined what each partner needed to improve to reduce delivery time. The provider said, *I'm only contractually obligated to create the order when I receive it. But we looked at the end-to-end order cycle time, and we crunched that data down. We drove that through. The client's customer satisfaction and the satisfaction from his sales guys were great because revenues increased because the sales guys could walk around and say, 'Buy from [names competitor] but it takes ten days and we're at eight.'* This innovation used data analytics and new processes.

How do these innovations come about? The next sections look at the findings on three sets of practices that emerged as critical—leadership pairs, incenting and contracting for innovation, and how innovations were delivered.

5 Dynamic Innovation: The Role of the Leadership Pair

An overview of the key factors supporting dynamic innovation in outsourcing relationships is given in Fig. 2.

Assigning the right leadership pair emerged as the key catalyst for jumpstarting the dynamic innovation process. In high-performing BPO relationships, we found a pair of extraordinary people leading the innovation agenda—one leader from the client organization and a counterpart from the provider organization. The leaders are both strong as individuals; Both leaders are experienced, capable, and have high levels of credibility, clout, and power within their own organizations.

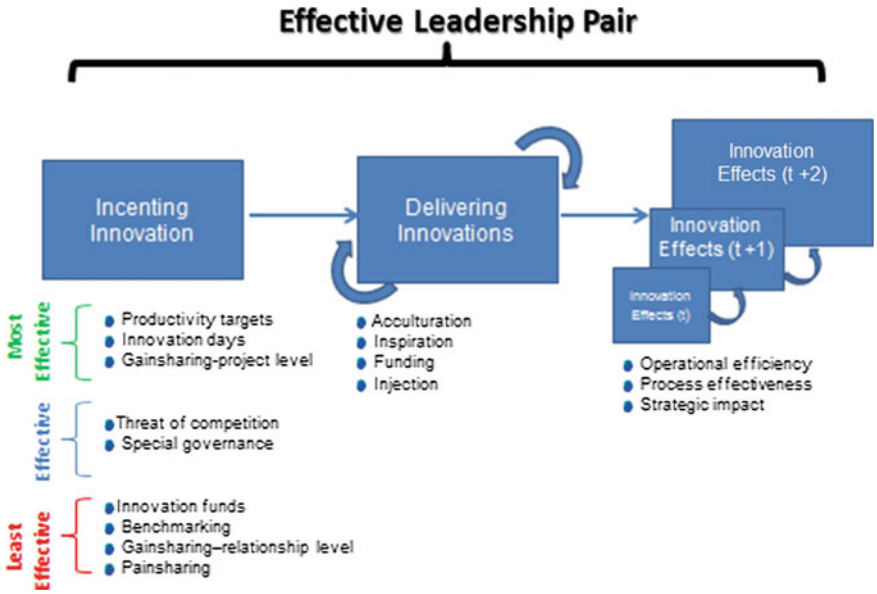


Fig. 2 The Dynamic Innovation Process: Clients incent providers to deliver many innovations each year that improve the client's performance in terms of operational efficiency, process effectiveness and/or strategic impact. The effects of any one innovation may be small at time t, but the effects of multiple innovations accumulate significantly over time (t + 1, t + 2, etc.). The entire dynamic innovation process is jumpstarted and lead by an effective leadership pair, representing both client and provider interests

Effective leadership pairs enjoy working together, which some research participants described as "chemistry". Effective leadership pairs displayed the following behaviors and held the following attitudes:

1. **Focus on the future:** The leadership pair focused on where they wanted the BPO relationship to go, not where the relationship was in the past or present.
2. **Spirit of togetherness:** The leadership pair presented a united front to stakeholders in their respective organizations.
3. **Transparency:** The leadership pair was open and honest about all operational issues.
4. **Problem solving:** The leadership pair sought to diagnose and fix problems; they did not seek to assign blame.
5. **Outcomes first:** The leadership pair always did what was best for the client organization and then settled a commercially equitable agreement.
6. **Action-oriented:** The leadership pair was not afraid to expend their powers; Leaders acted swiftly to remove or workaround obstructions to innovation stemming from people, processes, or contracts.

7. **Trust:** Perhaps as a consequence of the former behaviors, the leadership pair felt secure and confident in the other person's good will, intentions, and competency.[8]

In several cases, we found client-provider pairs who were both experienced leaders, but the combination simply did not work. Changing one or even both leaders can improve performance. (Two other researchers, Davis and Eisenhardt (2011), also found that rotating leadership produced more innovation in inter-organizational relationships.) For example, at one now high-performing BPO relationship based in Europe, the client leader requested a different provider account manager because he could not collaborate effectively with the initial person assigned. The provider granted his request. The client leader contrasted the two provider leads:

> The provider appointed a delivery account manager and through the initial sort of bloody period, the relationship did not work. I don't know whether it was chemistry or what. He was a more senior guy with the attitude, 'Well, I've done it, I've got the t-shirt, I know what I'm doing, I don't know why you're panicking, leave me alone to get on with it.' He may have been a very good person but I couldn't work with him. The provider bravely and ultimately was correct to say, 'okay, if that's the case, we'll pull him out.' They put somebody else in who was actually more junior but was somebody with whom we could work.

Of course, we found that many outsourcing relationships could not jump start their innovation because they did not have the right leadership pair. We found that just having one right leader makes a positive difference. The positive difference is stronger if that leader is on the client side rather than the provider side. With no right leaders, the practices that we enumerate in the next section are much less efficacious in their impact on innovation outcomes. Nevertheless, when applied, we found that they do contribute to positive differences, and do help to evolve the organizations towards a different, more high-performing relationship.

6 Incenting and Contracting for Innovation

As stated above, innovation is defined by its consequences on the *client's* performance. Clearly, providers need incentives to focus on innovations that improve the client's performance (e.g., client efficiency, effectiveness, strategic impact) rather than focus on innovations that solely benefit the provider (e.g., increased provider revenue or margin). Incentives can positively reward or negatively punish behavior. Gainsharing is a positive incentive that rewards good behavior with financial compensation. Painsharing is a disincentive that punishes bad behavior with a financial penalty. Both clients and providers in our study identified

[8] Bidault and Castello (2010) found that very low levels of trust and very high levels of trust are detrimental to innovation. They found that the optimal level of trust is somewhere in between.

mandatory productivity targets, innovation days, and gainsharing at the project level as the most effective incentives for innovation. The threat of competition (according to providers) and special governance for innovation (according to clients) were reported to incent innovation effectively. The least effective incentives were innovation funds, benchmarking, and gainsharing/painsharing at the relationship level. Let us look at these in more detail.

6.1 Yearly Productivity Improvements

Many BPO relationships are still priced based on resource inputs, such as pricing per Full Time Equivalent (FTE). Clients like the simplicity and predictability of FTE pricing, but they also realize that input-based pricing discourages the provider from implementing innovations that would reduce the number of FTEs because the provider's revenues would decrease. To overcome this disincentive, many BPO clients necessitate innovation by mandating productivity improvement requirements in the contract that require the BPO provider to improve the client's productivity, most typically by four to five percent per year. Both clients and providers reported positive results from mandatory productivity targets.

For example, the provider for one consumer goods client implemented a number of innovations, including new dashboards for better reporting and transparency and a new employee referral recruitment program to attract high-skilled talent like engineers. Pertaining to the new dashboards, which are powered by the provider's analytics, the client said:

> I'd say one of the recent innovations that we began to push for and the provider responded to beautifully was more fact-based analysis, the ability to look at analytics. For example, if we had a measure of client satisfaction, and if the measure was off the key service indicator, they don't just report the score, we could dive down and see what part of the business it was coming from. We could analyze hiring patterns. So, bringing in a lot more analytical rigor. It was not part of the original relationship. They really brought that to the table. Today, we are finding that, in the spirit of partnership, once we identify an area that is having difficultly, we can get very creative together in terms of how to go and attack that particular problem.

The provider for this client confirmed that the innovation was prompted by the productivity requirement:

> The dashboard is an innovation that we have implemented in the last year at no additional cost to the client. It is a part of our ongoing continuous improvement and stepping up our game in the BPO space.

6.2 Dedicated Time to Drive the Innovation Agenda

Innovation objectives can quickly slide down the list of priorities if everyone's attention is focused on operations. In high-performing BPO relationships, the partners allocate dedicated time each year to drive the innovation agenda. These clauses are called a number of things, including innovation days, invest days, or innovation forums. They work slightly differently on each account, but the essential commonality is collaboratively defining the innovation agenda for the coming year. On some accounts, invest days are essentially free consulting days by the provider's top-gun consultants. In these deals, the only stipulation is that the client and provider have to agree each year how the days will be used for possible mutual benefit. Innovation forums are typically scheduled quarterly. Clients use the forums to learn more about the provider's latest tools, technologies, and capabilities. One provider explains how she works with her consumer products client during the quarterly innovation forum:

> So we have in every major service line what is called an innovation forum at least once a quarter. We bring what we see in the marketplace and the client brings what they are seeing in their marketplace. So we bring, for example, what we see in consumer goods and services space that relates to talent management. That's an example. The client will bring what their business challenges are and what their internal HR strategy is. We'll look at this, combine it together, and figure what our continuous improvement agenda needs to be collectively over the next quarter.

6.3 Gainsharing at the Project Level

In the innovation survey, we asked respondents about the best options for designing innovation into outsourcing contracts. Respondents could tick multiple options from a choice of innovation funds, invest days, special governance for innovation, or gainsharing on innovation benefits. By far, across all three communities, gainsharing was identified as the best way to design innovation into the deal. Specifically, 79 % of customers, 77 % of providers, and 78 % of advisors indicated that gainsharing on innovation benefits was the best way to contract for innovation. Among all the ways to incent innovation, gainsharing packs the most punch because it promises to increase the provider's revenue as well as the client's performance. Despite the fact that gainsharing was the top ranked response in the innovation survey, clients indicated in a follow-up question that only 40 % of innovations delivered used gainsharing. Our case study research also found fewer than half the clients contracting for gainsharing clauses, or even when gainsharing was included in the contract, only half of these clients availed the gainsharing option. On the other hand, some clients reported that gainsharing was prompting powerful innovations on their accounts. These mixed results are best explained by looking at the unit of analysis. Gainsharing was most effective at the project level and least effective at the relationship level.

At the project level, the client and provider negotiate the gainshare for one project at a time. The levels of uncertainty are much lower at the project level and the partners can better estimate savings to be shared. One of the best examples of gainsharing comes from the Microsoft case study.[9] Microsoft has a global BPO contract for financial and accounting services with Accenture. The partners avoid the battles gainsharing usually triggers by agreeing to the gainshare in advance. Specifically, the partners agree upfront how much Microsoft's bill will be reduced. Accenture is guaranteed a share of that savings, and if Accenture can outperform, they pocket the difference. If Accenture underperforms, it absorbs the loss. For example, if Accenture is charging $100 for service performed by person X and earning $10 in profit, a transformation project that would eliminate person X would normally mean a loss of $10 profit for Accenture. Microsoft incents Accenture by agreeing to pay, say, $20 after the transformation. Under this hypothetical scenario, Accenture doubles their profit and Microsoft is guaranteed a reduced bill by $80. If the transformation project exceeds or falls short of expected gains, Accenture pockets the additional gains or absorbs the losses. This mechanism was designed to properly incent Accenture. Microsoft's Senior Director of Financial Operations explains:

> If I run a project together with Accenture that takes that person away, then Accenture loses the revenue of 100 and a profit of 10. That would be stupid of Accenture to do. So what we then did was looked at those projects to make sure we have a split of the gainshare to make it attractive for both of us to do this. The overall affect is the creation of strong incentives for Accenture:
> My client recognizes that I need to meet my financial commitments as the service provider. That may sound strange but there is a realization that, fundamentally, I have to be incentivized to do some of the things I need to do. The key message is a spirit of partnership that I don't think exists in the other engagements that I've come across. —Outsourcing Account Delivery Manager, Accenture

6.4 The Threat of Competition

In the absence of contractual incentives, several providers in our study still felt highly pressured to deliver innovations to clients because of the ubiquitous threat of competition. For example, one provider said:

> There is nothing in our contract that says we have to innovate at all. In my mind, if we don't innovate, at the time of contract renewal, the client will take this business somewhere else if we can't prove that we are delivering value beyond transactions.

On another BPO account, the provider sees innovations as a way to differentiate their services in a highly-competitive market:

---

[9] See Lacity, M., and Willcocks, L. (2012), "Mastering High-Performance: The Case of Microsoft's OneFinance" available at http://www.accenture.com/Microsites/highperfbpo/Pages/who-got-it-right.aspx.

> I think it is part of the valued added that we bring. We are constantly challenging ourselves to step up our game to improve all the time and adding value to the client's business. In doing so, we are also creating some offerings within our BPO space that are very different than conventional BPO.

6.5 Special Governance for Innovation

Large BPO relationships are governed typically by operating committees focused on day-to-day operations, management committees focused on monthly invoices and service level reports, and steering committees comprised of the senior most executives, but who only meet annually (unless there is an escalated dispute). Sixty percent of the clients responding to our innovation survey indicated that innovation needs special governance outside the constraints of these existing committees. However, only 42 percent of providers agreed. From our interviews, we found that the people selected to lead are more important than the structures erected to govern.

6.6 Innovation Fund

An innovation fund is a separate account set aside to fund future innovation projects. On our survey, innovation funds were recommended by 38 percent of clients, 30 percent of providers, and 33 percent of advisors. These lower percentages may be due to the fact that such funds are often too small to excite and motivate parties (Weeks 2004).

6.7 Benchmarking

Some respondents on the innovation survey suggested that benchmarks incent innovation. Third-party benchmarking of best-in-breed prices and service levels are intended to incent providers to increase performance in step with competitors. While many interviewees said their companies do external benchmarking to gather market data, none supported the idea that benchmarking is an effective mechanism to incent innovation. In reality, we learned, external benchmarks often triggered more disputes than innovations. For example, when an external benchmark found that the provider's unit price was well above best-in-breed price, the client wanted the price reduced. The provider claimed the comparison was unfair because the provider was maintaining the client's old technology; Newer technology—the provider argued—would be more efficient and thus have a lower price.

6.8 Gainsharing/Painsharing at the Relationship Level

Gainsharing at the relationship level establishes targets for the overall performance of the relationship, usually assessed yearly. Clients and providers reported many problems with this gainsharing mechanism. Some clients think gainshare targets are too low. One energy client provides an example. His contract provides a gainshare if the provider exceeds targets and a painshare if they miss targets. Every year, the provider exceeds the targets and earns a gain. On the one hand, this energy client is delighted with the provider's performance. On the other hand, he suspects the initial targets were too low:

> The standards were a bit one-sided and not difficult to meet. It ensured that each year there was a good bit of gain, and the gain went to the provider. We lose the notion of pain/gain. To me, you should really challenge yourself to be accurate on your projections of cost as humanly possible. Your metrics should be at a high level and your performance should be at a high level. You should be truly delivering something fairly extraordinary to benefit from gainsharing. That wasn't necessarily the case.

Some clients and providers could not agree on a baseline performance measure, resulting in the parties abandoning the notion of gainsharing even though it was designed into the deal. For example, one telecommunications client and BPO provider hoped to use gainsharing to prompt innovations in new hire training, but they had no good way to measure the baseline. The provider explains:

> In one of our contracts, we actually agreed to put incentive based mechanism in place, and we contracted for that. However, once we got into the contract we found that the baseline was not really measurable so that was never implemented. But certainly, the intent was there. So we could never agree to what baseline was so we could never demonstrate that we moved away from that baseline. It was quite disappointing for everybody.

Another big challenge was interpreting the gainsharing clause. In one BPO relationship, the client and provider escalated the fight over gainshare allocations to a formal dispute. The context was a procurement deal in which the provider was responsible for the procurement software and procurement services. The contract stipulated that the provider would get a percentage of any discount above a vendor's list price for any new products the provider bought for the client. The provider renewed a hardware vendor contract on behalf of the client that was 55 percent lower than the hardware vendor's list price. The provider calculated a multi-million dollar gainshare, claiming the contract was for new products as evidenced by new material codes. The client refused to pay. The client claimed the previous contract with the hardware vendor already had a 50 percent discount and the client was purchasing the same material, it was just that the vendor's newer models used different codes. The client allocated about 150 h of in-house legal counsel to the dispute and brought the advisory firm that helped negotiate the original contract back into the deliberations. The client put so much energy, time and resources to the dispute, that in the end the client reported that *"the provider gave up"*. Although the partners resolved the conflict, the partnership was weakened according to the client. *It went all the way to dispute process and it left an*

incredibly bitter taste with our executive team, said the client. Eventually the provider's procurement services division was bought by another provider. The client is very pleased with the new services provider. *The [new provider] is incredibly customer-focused first, provider-focused second. It's an incredible reversal compared to the previous provider*, said the client.

7 Delivering Innovation

Partners may negotiate innovation clauses into the contract, but innovation typically does not occur at first. In fact, the most typical pattern we found—even in ultimately high-performing relationships–is that client performance got worse during the transition phase, then performance stabilized, then performance significantly improved as the effects of the provider's first transformation levers—labor arbitrage, centralization, and standardization—took effect. The challenge—and what differentiated high-performing relationships from normal-performing relationships—was sustaining the innovation agenda over time. From the survey and interviews, we sought to better understand how cultures nurture innovation, which parties come up with the ideas for innovation, how are innovations funded, and how are they delivered.

While partners may incent innovation by including productivity targets, allocating innovation days, and agreeing to gainshare on innovation projects, innovation still won't happen unless both clients and providers implement a process which we have described as AIFI—**A**cculturating (across parties at all levels), **I**nspiring (joint, provider and client generated ideas), **F**unding (in general proposers fund innovations) and **I**njecting (strong change management to transition individuals, teams and organizational units from the present to future state).

7.1 Acculturation

Academic research on BPO relationships has generally found that cultural distance, defined as the extent to which the members of two distinct groups (such as client and provider organizations) differ on one or more cultural dimensions, negatively affected outsourcing outcomes (Lacity et al. 2011). This was particularly relevant in the cases of offshore outsourcing. In general, research found that clients find it easier to work with providers that share a similar culture. However, cultural distance can be overcome with a capability called Cultural Distance Management, the ability of client and provider organizations to understand, to accept, and to adapt to cultural differences. Acculturation explains the process by which two or more cultures merge to form a cohesive culture. Merged cultures often end up borrowing aspects of both the client's and provider's cultures. In several BPO relationships we studied, the partners went so far as to brand the

provider's delivery centers with the client's company colors, logos, and office layouts. For their part, clients recognized the special holidays and festivals in the provider's culture. In the context of dynamic innovation, a culture that encourages and welcomes innovation ideas is crucial.

In high-performing BPO relationships, client executives actively encourage all levels in the provider organization to challenge the status quo, to question assumptions, in short, to find innovations that will improve the client's performance. One high-performing BPO relationship between an energy company and a global provider serves as an example. The client and the remotely-located provider employees have monthly meetings to encourage and financially reward continuous improvement and innovation. This client leader has also transformed the behavior of the remotely-located provider employees by encouraging them to challenge the client more:

> We absolutely encourage–and I've done this face-to-face sitting there in India—to challenge us. We know we are complex, we know that we create some of our own problems; we are our own worst enemies in some areas. We absolutely want you to point some of those things out and point out some ideas. Not only is it not disrespectful but I will find it disrespectful from now on if you tell me nothing and I have to figure it out myself. We have tried to make that out positive. It's generated lots of good ideas that we've been able to put into practice.

But BPO relationships don't just operate in two organizations (the client's and provider's), but in four or more organizations, each with its own culture: (1) the client's centralized business services organization that "owns" the BPO relationship, (2) the client's decentralized business units that receive BPO services, (3) the provider's centralized organization that sells BPO services and allocates resources to accounts, and(4) the provider's globally dispersed service delivery centers which may operate in several countries like India, China, the Philippines, Brazil, etc. Each organization typically wants different things from the BPO relationship. The client's centralized business services organization often wants tight cost controls, high productivity, and process standardization. The client's decentralized user communities are bothered by controls, procedures and standards; instead they want responsive, flexible, and custom services. The provider's centralized culture will likely value aggressive growth. The provider's globally dispersed delivery teams want to please both their supervisors and customers, which can leave them caught between conflicting cultures. The BPO leadership pair is tasked with acculturation, the process by which two or more cultures merge to form a cohesive culture. In the context of dynamic innovation, the resulting culture must be transparent so that even remotely-located provider employees understand how their work contributes to the client's performance. One provider explains:

> When someone is sitting in a place miles away, it is really important for that person to understand the impact of what he or she is doing to the client organization. As soon as you are able, get that culture in offshore delivery locations, or even onshore delivery locations, so they can relate to what kind of impact they are bringing to the client. I think it makes a huge difference in performance.

The culture must also encourage, welcome, and reward innovation ideas.

7.2 Inspiration: Generating Innovation Ideas

One question we sought to answer is, "which stakeholder is the primary source for innovation ideas?" Anecdotally, clients seemed to claim clients generated most of the innovation ideas and providers seemed to claim providers generated most of the innovation ideas. Consider what this pharmaceutical client said:

> Although the SLAs are green, we feel the providers haven't brought enough innovation to the table for us. I don't think any of the continuous improvement ideas have necessarily been driven by the providers, most of them have been client driven. Another client from an aircraft engine manufacturer allocated the credit for innovation ideas as follows: I'd say it's probably 70 percent from our side and 20 percent from the provider side and remainder 10 percent is jointly.

To get a more representative answer, we asked respondents of the innovation survey to identify which stakeholders were the primary sources for innovation ideas (See Fig. 3).

Overall, 189 client, provider and advisor respondents to this question agreed that the majority of innovation ideas were either jointly created between clients and providers (37 %) or providers created innovation ideas on their own (35 %). There were some differences in the magnitude of percentages among the three communities. According to 65 outsourcing clients who answered the question, 32 % said innovations ideas were jointly created with providers, 32 % said providers were the primary source of innovation ideas, 24 % identified themselves as the primary source, and 11 % credited advisors for innovation ideas. According to 86 providers who answered the question, 43 % said innovations ideas were jointly created with clients, 40 % identified themselves as the primary source, 14 % indentified clients as the primary source, and 3 % credited advisors for innovation ideas. Not surprisingly, 37 % of the advisors credited themselves as the primary source of innovation ideas.

Jointly-developed Innovation Ideas. As the survey indicates, many innovations are collaboratively identified, most frequently during the execution of innovation days, invest days, or innovation forums. For example, at one bank the partners create a jointly developed innovation plan every year. The provider explains:

> Between ourselves and the client, we ask: what additional value in innovation can we bring in any given year? We have our basic operational plan for any given year. What sits on top of that is that is an innovation plan that we try to focus on at least four to six key value innovations in any given year.

The provider delivered training more efficiently and effectively to the client by moving 40 % of the training courses online, including mobile learning capabilities through Smartphones. The innovations are not separately funded but rather part of the overall base contract.

Provider-driven Innovation Ideas. In the innovation survey, providers were credited as the primary source of innovation by 35 % of respondents. Providers are

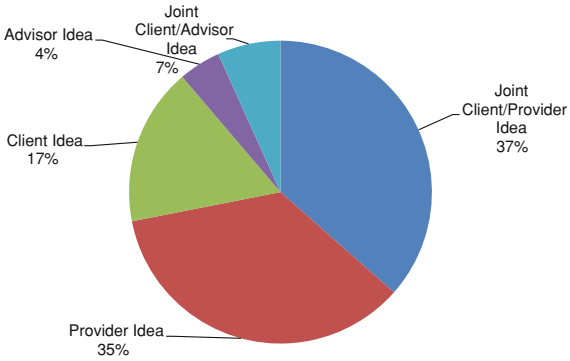


Fig. 3 The primary source of innovation ideas (n = 189 respondents)

well poised to propose innovations—if incented to do so—because of their breadth and depth of expertise. Concerning breath of BPO expertise, providers are able to generate innovation ideas because BPO is core to the provider's business but non-core to their client's business. In contrast to clients, providers focus intensely on BPO, execute services frequently, cross-fertilize ideas across a global client network and spot BPO trends quickly. Providers also have deep insight into the client's data and processes, which afford them a vantage for identifying innovations that can really impact the client's business value.

The evidence for the provider-driven innovation is most convincing when presented by BPO clients. For example, one electronic design automation client was quite pleased with his procurement provider's ability to innovate based on their expertise. Of the provider account delivery manager, he said:

> He's constantly thinking about procurement savings, category expertise, supply chain management and so on. That's what you get by having someone focus on one area specifically.

This client also said that providers can attract and retain top talent better than a client's in-house function. He praised the quality of the provider's experts and drew this analogy:

> My Berkeley education, I still remember when Glenn Seaborg walked into my CALC—1A class with all my 1,000 friends and gave a lecture on his Nobel Prize winning research. It was one of those things where you go, 'Wow! That's why I'm at Cal.' Similarly, there are moments in procurement that you can't put it into a contract but someone from the provider walks into a situation and you listen to them and you watch the stakeholder guys say, 'This guy knows what he's talking about.' Or, 'she knows what she is talking about.' It is those kinds of situations that really drive premier organizations. Every college couldn't have Glenn Seaborg. So, it's that resource-heavy, resource-laden, value-add that you get from an outsourcing relationship. I think that's an innovation that can't be underestimated. And, I think the provider is really adding to that, just from the people that I've met so far.

7.3 Funding Innovation

On the innovation survey, respondents were asked to indicate who funded the innovation project. In alignment with the primary source for innovation ideas, 45 % of innovations were jointly funded, 34 % were provider funded, and 20 % were client funded. We mapped funding responses to the source of the idea responses (see Table 1) and found that in general, the stake holder(s) who propose innovations, help fund innovations. People may be only incented to pitch innovation ideas if they themselves would benefit and thus would are willing to finance the innovation project in whole or in part.

7.4 Injection: Change Management

Clients from high-performing BPO relationships understand that they cannot be passive recipients of innovations, but clients must aggressively manage the changes the innovations bring to their organizations. In other words—provider incentives lay the foundation for dynamic innovation, but the execution of dynamic innovation requires strong change management to transition individuals, teams, and organizational units from the current state to the desired future state. Change management is so important, it was identified as one of the eight best practices for delivering high-performance in BPO relationships.[10]

Innovations have to be accepted by two groups of clients—the client leads responsible for the BPO relationship and the cadre of globally-dispersed end-users. Sometime it's the client leads that kill an innovation idea because they lack the energy or resources to lead the change management effort an innovation idea requires. For example, one hi-tech client relayed this story:

> For some of the provider's ideas they've made aware to us and we've gone, 'yeah, thanks for telling us but actually we don't care to do it.' They say, 'We can make you more efficient in this area if you do so and so and so and so.' And we said, 'yeah, but we're not prepared to do so and so and so and so, so we'll have to stay inefficient.'

Similarly, another telecommunications client leader has not been very proactive on innovation. According to the provider on this account:

> Over the years, we run an annual innovation day where we bring people in from overseas and we showcase the latest products and things like that that we have. Over the last five years, the take-up of the innovation has been a little bit underwhelming.

The risk of course, is that the provider will stop investing their time and resources in identifying innovations if clients continually reject ideas. If the client leaders are excited about an innovation and if those leaders are respected within their own

[10] See Accenture (2012) *Achieving High Performance in BPO: Research Report*. Accenture, London available at http://www.accenture.com/Microsites/highperfbpo/Pages/home.aspx.

Table 1 Source of Innovation Ideas and Funding

	Provider's idea	Client's idea	Joint provider/client idea	Total
Provider-funded	35	4	16	55 (36 %)
Client-funded	13	12	5	30 (20 %)
Jointly-funded	14	14	39	67 (44 %)
Total	**62 (41 %)**	**30 (20 %)**	**60 (39 %)**	**152 (100 %)**

organizations, then they are usually successful in their change management efforts. One hi-tech provider on a high-performing BPO relationship said of his client lead:

> He knows the business very well. He knows how relationships work and he's very politically savvy. So I think it's very important your relationship person is respected within the client organization, has weight with them and is a very strong political operator.

This client lead said effective change management needs to be driven from the board, but that a powerful leader has to be in charge of operations:

> You need quite senior and experienced managers driving it who could make rapid decisions when needed and who could bulldoze obstacles out of the way when required. So I think it really does need board level, that's clear, but you need somebody with a bit of clout actually actively involved in running the thing to make it happen.

8 Management Implications

High-performing BPO relationships are good at sustaining innovation, but many other BPO relationships still need to work on incenting, contracting for and delivering dynamic innovation. Here are some management guidelines for action based on our research.

It is never too late to innovate. For example, we found several top performers—for example, Microsoft—introducing gainsharing mechanisms after the BPO relationships stabilized. One aircraft engine manufacturer client on the road to high performance, just recently adding gainsharing to incent innovation beyond the productivity improvement requirement:

> The provider is bound to demonstrate productivity gains year over year under the contract terms. But there is no incentive for the provider to go beyond that. So what we did was incent through gainsharing model anything that went beyond the required percent of productivity gained. It's not only the provider, we made it a joint productivity gain initiative so there is also reward and recognition for our own people when we go beyond the threshold.

On another account, the contractual clauses stayed dormant for several years until a new client executive took over the account. Before his arrival, the client never

used the hundred plus days devoted to innovation in the contract. Under the new leadership, the partners used 50 % of the invest days his first year in charge and 100 % of the invest days the second year. The client reported positive benefits:

> We went from using zero days in 2009 to using 100 percent of them in 2011. And that's resulted in a significant surge forward in understanding what the provider can do and led us to transition to some stuff at the beginning of 2011 that we hadn't even anticipated and now we're going live at end of 2011.

Both parties benefited because the provider increased the scope of work and the client benefitted from the labor arbitrage of moving more work offshore.

Innovations escalate along a novelty curve. We have already discussed that dynamic innovation entails continuous, energetic, and sustained efforts that improve the client's performance over time. We also found that on many accounts, the novelty of individual innovation increases over time. At the beginning of a BPO relationship, the more experienced providers frequently brought best-in-bred innovations in technology, tools, processes, and methods to their less experienced clients. But as high-performing BPO relationships matured, the client had already absorbed the best-in-class innovations available from the provider. The next round of innovations, therefore, required more novelty. The provider for an electronic design automation client explained:

> Early on, what we brought to the client was, 'Well, here's best-in-class, here's where you are, let's close that gap.' That's really what drove a lot of the innovation. I think we've exhausted a lot of those opportunities. Now, given that they've reached best-in-class, for them to be innovative, they've got to do something that's maybe a little bit out there. And so we're in the middle of working on some exciting things there.

As with anything more novel, the partners have to address risk-sharing and intellectual property ownership.

Analytics will increasingly play a role in innovation. In high-performing relationships, business analytics is increasingly the driver of innovation after other transformation levers—typically labor relocation, centralization, and standardization—have been deployed. One provider on a high-performing BPO account with a hi-tech company explained:

> Whoever you select as a provider, within one year, the SLAs are going to be green. That's just going to happen. The business case, that's mostly labour arbitrage. So one year in, everything's green, you're going to ask, so where do I get my additional value? And you need to look at a provider who can start thinking about that and providing that. And the only way you drive that out is through the analytics that look at processes end-to-end.

Whereas business analytics examines past business performance, predictive analytics forecasts the probabilities of possible future outcomes and plans accordingly. Clients in high-performing BPO relationships increasingly rely on the provider's predictive capabilities, which are enabled by their technologies, for innovations that lead to better performance. In one BPO account for a large, multi-state healthcare organization, the BPO service provider pre-examines healthcare claims and predicts whether the claim will require rework. Now, more than 50 %

of the preventable financial rework is identified and corrected. Predictive analytics saves between $25 and $50 in administrative costs per overpaid claim and between $6 to $12 per underpaid claim.

9 Limitations of Research

This research has a number of limitations. Pertaining to the interviews, the 24 BPO relationships do not represent a random sample, but rather a convenience sample. The disadvantage of a convenience sample is that it includes sampling bias, and findings do not represent the population of BPO relationships. We and the research sponsors aimed to understand emerging best practices from high-performing BPO relationships, thus the paired interview samples are purposefully biased towards higher-performing relationships. In the introduction, we gave a better indication of the population of BPO relationship outcomes, which indicates that about 20 % of relationships are high-performing in the wider population. We know that BPO performance is not static, nor a given. By studying high-performers, practitioners may consider the suitability of the lessons learned for their own BPO relationships.

The survey also has a number of limitations in that we were severely limited in the number of questions we were allowed to ask; Participants had to be able to answer the questions in five minutes, thus we could not measure constructs with multiple item scales. The survey was primarily beneficial for understanding the definition of innovations, the source and funding for innovations in outsourcing relationships, and getting examples of innovations.

10 Conclusion

High-performing BPO relationships are good at dynamic innovation, but many other BPO relationships still need to work on incenting, contracting for and delivering innovation. The most important catalyst is an effective leadership pair to drive the dynamic innovation process. Even BPO relationships that were poor-performing initially were transformed over quite short periods of time into good or even great BPO performers under a new leadership pair. The leaders foster dynamic innovation by creating strong incentives. Even when contracts did not initially include innovation incentives, we found several high-performance organizations adding incentives after the BPO relationships stabilized.

But effective innovators recognize that creating incentives can only take you so far. Delivering innovations requires a process we call AIFI—**A**cculturating, **I**nspiring, **F**unding, and **I**njecting. It has been frequently remarked that “If you always do what you always did, you will always get what you always got.” To achieve step-change improvements, organizations need to break the strong forces of habit and administration in their outsourcing arrangements, and mandate

innovation. The outsourcing industry increasingly cannot ignore the innovation potential and value buried in and passed up by its more traditional modes of operation. The practices we document in this chapter add up to no less than a mind-set and behavior change for all parties determined to meet the dynamic innovation challenge.

Acknowledgements A shorter executive version of this chapter was first published in Lacity, M. and Willcocks, L. (2013), "Beyond Cost Savings: Outsourcing Business Processes for Innovation," *Sloan Management Review*, Spring Issue. We also thank and acknowledge our research sponsors, Accenture, Orbys, and BPeSA.

This chapter has previously been published in *Strategic Outsourcing: An International Journal*.

References

Babin, R., & Schuster, C. (2012). Building innovation into the outsourcing relationship: A case study. *The Journal of Information Technology Teaching Cases, 2*, 1–6.

Beverakis, G., Dick, G., & Cecez-Kecmanovic, D. (2009). Taking information systems business process outsourcing offshore: The conflict of competition and risk. *Journal of Global Information Management, 17*(1), 32–48.

Bidault, F., & Castello, A. (2010). Why too much trust is death to innovation. *Sloan Management Review, 51*(4), 33–38.

Ciravegna, L., & Maielli, G. (2011). Outsourcing of new product development and the opening of innovation in mature industries: A longitudinal study of fiat during crisis and recovery. *International Journal of Innovation Management, 15*(1), 69–93.

Datta, P., & Bhattacharya, K. (2012). Innovation returns and the economics of offshored IT R&D. *Strategic Outsourcing: An International Journal, 5*(1), 15–35.

Davenport, T., Leibold, M., & Voel, S. (2006). *Strategic management in the innovation economy*. New York: Wiley.

Davis, J., & Eisenhardt, L. (2011). Rotating leadership and collaborative innovation: recombination processes in symbiotic relationships. *Administrative Science Quarterly, 56*(2), 159–201.

DiRomualdo, A., & Gurbaxani, V. (1998). Strategic intent for IT outsourcing. *Sloan Management Review, 39*(4), 67–80.

Fontana, A., & Frey, J. (1994). Interviewing: The art of science. In Denzin & Lincoln (Eds.), *Handbook of qualitative research* (pp. 361–376). Thousand Oaks: Sage Publications.

Glaser, B., & Strauss, A. (1999). *The discovery of grounded theory: Strategies for qualitative research*, Sage publications, Chicago, 1967, reprinted 1999.

Grimpe, C., & Kaiser, U. (2010). Balancing internal and external knowledge acquisition: The gains and pains from R&D outsourcing. *Journal of Management Studies, 47*(8), 1483–1509.

Hatonen, J. (2010). Outsourcing and licensing strategies in small software firms: Evolution of strategies and implications for firm growth, internationalisation and innovation. *Technology Analysis and Strategic Management, 22*(5), 609.

Kishore, R., Agarwal, M., & Rao, H. R. (2004). Determinants of sourcing during technology growth and maturity: An empirical study of e-commerce sourcing. *Journal of Management Information Systems, 21*(3), 47–82.

Klein, H., & Myers, M. (1999). A set of principles for conducting and evaluating interpretive field studies. *MIS Quarterly, 23*(1), 67–88.

Kvale, S. (1996). *Interviews: an Introduction to Qualitative Research Interviewing*. Thousand Oaks: Sage Publications.

Lacity, M., Khan, S., Yan, A., & Willcocks, L. (2010). A review of the IT outsourcing empirical literature and future research directions. *Journal of Information Technology, 25*(4), 395–433.
Lacity, M., & Rottman, J. (2012). Delivering innovation in outsourcing: findings from the 2012 outsourcing world summit. *Globalization Today*, 26–31.
Lacity, M., Solomon, S., Yan, A., & Willcocks, L. (2011). Business process outsourcing studies: A critical review and research directions. *Journal of Information Technology, 26*(4), 221–258.
Lacity, M., & Willcocks, L. (2009). *Information systems and outsourcing: studies in theory and practice*. London: Palgrave.
Lacity, M., & Willcocks, P. (2012). *Advanced outsourcing practice: rethinking ITO, BPO, and cloud services*. London: Palgrave.
Linder, J. (2004). Transformational outsourcing. *Sloan Management Review, 45*(2), 52–58.
Lucena, A. (2011). The organizational designs of R&D activities and their performance implications, "Empirical evidence for Spain". *Industry and innovation, 18*(2), 151–176.
Mahoney, C. (1997). Common qualitative techniques. In *User-friendly handbook for mixed method evaluations*. Published by the Division of Research, Evaluation and Communication for the National Science Foundation, publication number NSF97-153, pp. 1–17.
Massini, S., & Miozzo, M. (2012). Outsourcing and offshoring of business services: Challenges to theory, management and geography of innovation. *Regional Studies, 46*(9), 1219–1242.
McKeown, M. (2008). *The truth about innovation*. Toronto: Pearson Education.
Mihalache, O., Jansen, J., Van Den Bosch, F., & Volberda, H. (2012). Offshoring and firm innovation: The moderating role of top management team attributes. *Strategic Management Journal, 33*(12), 1480–1498.
Moon, J., Swar, B., Choe, Y., Chung, M., & Jung, G. (2010). Innovation: Management, innovation in IT outsourcing relationships: Where is the best practice of IT outsourcing in the public sector? *Policy and Practice, 12*(2), 217–226.
Nieto, M., & Rodríguez, A. (2011). Offshoring of R&D: Looking abroad to improve innovation performance. *Journal of International Business Studies, 42*, 345–361.
Oshri, I. (2012). Innovation returns from offshored IT R&D: A response article. *Strategic Outsourcing: An International Journal, 5*(1), 36–38.
Oshri, I., Kotlarsky, J., & Gerbasi, A. (2012). Can client firms achieve radical innovation in IT outsourcing? *6th Global Sourcing Workshop*, Courchevel, France.
Quinn, J. B. (2000). Outsourcing innovation: The new engine of growth. *Sloan Management Review, 41*(4), 13–28.
Rao, M. T., Poole, W., Raven, P. V., & Lockwood, D. L. (2006). Trends, implications, and responses to global IT sourcing: A field study. *Journal of Global Information Technology Management, 9*(3), 5–23.
Rogers, E. M. (2006). *Diffusion of innovations*. New York: Free Press.
Sobol, M., & Apte, U. (1995). Domestic and global outsourcing practices of America's most effective IS users. *Journal of Information Technology, 10*, 269–280.
Stanko, M., & Calantone, R. (2011). Controversy in innovation outsourcing research: Review, synthesis and future directions. *R & D Management, 41*(1), 8–20.
Uriona-Maldonado, M., De Souza, L., & Varvakis, G. (2010). Focus on practice service process innovation in the Brazilian electric energy sector. *Service Business, 4*(1), 77–88.
Weeks, M., & Feeny, D. (2008). Outsourcing from cost management to innovation and business value. *California Management Review, 50*(4), 127–146.
Weeks, M. (2004). Information technology outsourcing and business innovation: An exploratory study of a conceptual framework. Ph.D. thesis, Oxford University.
Weeks, M., & Thomason, S. (2011). An exploratory assessment of the linkages between HRM practices, absorptive capacity, and innovation in outsourcing relationships. *International Journal of Innovation Management, 15*(2), 303–334.
Willcocks, L., Cullen, S., & Craig, A. (2011). *The outsourcing enterprise*. London: Palgrave.
Wright, R. (2012). Why innovations are arguments. *Sloan Management Review, 53*(3), 96–95.

Weigelt, C., & Sarkar, M. (2012). Performance implications of outsourcing for technological innovations: Managing the efficiency and adaptability trade-off. *Strategic Management Journal, 33*(2), 189–216.

Whitley, E., & Willcocks, L. (2011). Achieving step-change in outsourcing maturity: Toward collaborative innovation. *MIS Quarterly Executive, 10*(3), 95–107.

Yin, R. (2003). *Case study research: design and methods* (3rd ed.). Thousand Oaks: Sage.

Part II
Governance Frames

Client Satisfaction Versus Profitability: An Empirical Analysis of the Impact of Formal Controls in Strategic Outsourcing Contracts

Nishtha Langer, Deepa Mani and Kannan Srikanth

Abstract The reach and impact of outsourcing is growing fast to include a variety of strategic objectives. Unlike in transactional outsourcing, where the vendor leverages scale economies to provide standardized services at reduced costs of ownership, client satisfaction in strategic outsourcing is contingent on the extent to which the vendor's service offering is customized to meet heterogeneous, unique client needs. However, project management practices that lead to high levels of client satisfaction may be incompatible with the project's financial performance. In this study, we investigate how managerial actions differentially impact project profitability and client satisfaction. Using rich field data on 390 strategic outsourcing contracts, we examine the differential impact of output controls, activity controls and capability controls on client satisfaction and contract profitability. We find that activity controls are positively associated with client satisfaction and profitability; in contrast, our results present mixed evidence for capability controls, and negative impact for output controls. In addition to contributing to research in control theory, our results provide actionable insights for vendors into appropriate strategies and tactics for competing efficiently and effectively in services markets.

Keywords Outsourcing · Client satisfaction · Profitability · Control theory · Business value of IS · Empirical research/study

Over the past decade, outsourcing has evolved from being a cost-saving tool for transaction-intensive business processes to a powerful strategic lever that is fundamental to firm competitiveness (Gottfredson et al. 2005. Firms are increasingly

N. Langer · D. Mani (✉) · K. Srikanth
Indian School of Business, Hyderabad, India
e-mail: deepa_mani@isb.edu

N. Langer
e-mail: nishtha_langer@isb.edu

K. Srikanth
e-mail: kannan_srikanth@isb.edu

R. Hirschheim et al. (eds.), *Information Systems Outsourcing*, Progress in IS,
DOI 10.1007/978-3-662-43820-6_4

looking beyond firm boundaries for strategic capabilities such as research and design, financial planning, and customer support. However, unlike transactional outsourcing, where the vendor leverages scale economies to provide standardized services at reduced costs of ownership, strategic outsourcing services are necessarily heterogeneous and idiosyncratic in their delivery, encompass a wide range of strategic purposes such as increased revenue, reduced time-to-market, or access to new capabilities, and involve greater responsiveness to changing business needs. In turn, client satisfaction in strategic outsourcing is contingent on the extent to which the vendor's service offering is customized to meet heterogeneous, unique client needs. However, project management practices that lead to high levels of client satisfaction may be incompatible with the project's financial performance. For example, increasing satisfaction may require client-specific investments, often non-contractible that may reduce the vendor's economies of scale. It follows that an understanding of how managerial actions differentially impact project profitability and client satisfaction and eliciting trade-offs among these objectives, if any, would be valuable to the theory and practice of strategic outsourcing.

In this paper we investigate whether and how vendors can strike a balance between delivering strategic outsourcing services efficiently and delivering them effectively. A review of the literature reveals two viewpoints. One school of research (Porter 1996) suggests a firm's activity systems need to be fundamentally different to produce at low cost versus at high quality output. To the extent that client satisfaction on a project demands high quality outputs that may not be fully monetized, perhaps, due to the need for non-contractible investments, client satisfaction and project profits are incompatible. This finding is consistent with, who finds that when satisfaction is more dependent on customization than standardization, and when it is difficult to provide both simultaneously, satisfaction is likely to be at odds with profitability. Indeed, Puranam and Srikanth (2007) argue that the failure of strategic outsourcing projects may be associated with the pursuit of multiple objectives.

Another school of research argues that client satisfaction and profitability are compatible. Investments in satisfaction reduce the costs of customer management, while at the same time, lowering the marginal costs of future transactions. This argument is especially pertinent to strategic outsourcing, where the vendor's primary governance costs are the cost of cooperation and coordination with the client (Mani et al. 2011). Continued long-term association with the client that results from client satisfaction is associated with greater trust and learning that help reduce friction, measurement costs and other transaction costs. Further, the client's investments in coordination complement those of the provider to meet task objectives (Mani et al. 2011), and satisfied clients are more likely to make these investments. Finally, reputation effects engendered by satisfied clients reduce overall customer acquisition costs.

In this paper we investigate how the organization of delivery of strategic outsourcing services influences project profitability versus client satisfaction. A critical aspect of delivery of complex outsourced tasks involves the use of formal

controls that "*induce desired performance while inhibiting dysfunctional behavior*". The underlying logic behind the use of sophisticated controls is mitigation of unforeseen contingencies and greater predictability in the attainment of desirable organizational goals. These benefits of formal control are particularly salient to the performance of inter-firm relationships such as strategic outsourcing that are characterized by high levels of uncertainty, ambiguity, and complexity in the relational and task environment. Our study uses rich field data on 390 strategic outsourcing contracts implemented by a leading global technology vendor to examine the nature and consequences of formal controls on client satisfaction and profitability in strategic outsourcing. In particular, we examine how investments in output controls, activity controls and capability controls in these projects differentially impact profitability and client satisfaction. We further examine how such impact of the controls is moderated by required quality standards and complexity of the outsourcing project.

Our study has important theoretical implications for scholars studying governance of inter-firm relationships. Prior research in this space has largely examined control in terms of the contractual structure used to formalize the relationship. Despite the advances in control theory (Eisenhardt 1985), little is known about process controls that actually implement the contract to directly influence task execution. In not paying attention to these controls, we may underestimate the importance of implementation of the outsourcing contract and develop an incomplete understanding of control mechanisms in outsourcing. Lack of attention to process controls in extant studies on inter-firm coordination is largely an outcome of their use of survey measures or qualitative analyses rather than field data. Our study draws on organizational and economic theories of control to theorize about outcome and process controls in strategic outsourcing. Rich field data on 328 strategic outsourcing contracts implemented by a leading global technology vendor help test our hypotheses.

Our results for the impact of output and process controls on client satisfaction and profitability also provide insights into the appropriate strategy and tactics for each of these objectives. These findings are salient to a competitive environment for services, where cost structures are making price competition difficult, compelling vendors to reduce price elasticities and retain extant customers. The ensuing pursuit of satisfaction is especially pertinent to the delivery of strategic outsourcing services, whose reach and impact are growing in contemporary firms. The costs of this pursuit must be well understood so vendors may compete both efficiently and effectively in the services market.

1 Theory and Hypotheses Development

1.1 Profitability and Service Satisfaction as Dual Objectives in Strategic Outsourcing

That managers are interested in profitability is a truism. Strategic outsourcing contracts are typically longer-term contracts involving significant resource deployments on the part of the vendor. It is unsurprising that managers attempt to generate profits from these projects, and indeed project profitability is a key metric in the performance evaluation of most project managers heading such initiatives.

It is a common practice in the industry that project managers of strategic outsourcing projects are also evaluated on client satisfaction. Client satisfaction has been linked to long-term profitability and success of outsourcing of near-core, strategically relevant activities. One primary benefit of client satisfaction is continued long-term association with the client. Long-term relationships have a number of advantages arising from trust and learning. The "shadow of the past" effect reduces the vendor's cost of servicing the client over time (cf: Dyer 2000). These cost advantages arise from improved coordination and a reduction in governance costs. With time, the vendor's increasing familiarity with the client's business, structures and processes reduces coordination costs. With increasing mutual trust, appropriation concerns and transaction costs decrease, and the client and the vendor are able to negotiate governance mechanisms that may be less costly to implement (Ring and Van de Ven 1994; Argyres and Mayer 2007). Finally, reputation effects engendered by satisfied clients reduce overall customer acquisition costs, both from additional business from the current client, and recommendations to new clients.

In sum, managers responsible for delivering strategic outsourcing services face a dual mandate—that of increasing client satisfaction with their services while ensuring project profitability. However, there are contrasting views on whether firms can simultaneously maximize client satisfaction and profitability. One view holds that the pursuit of both customer satisfaction and profitability is compatible. For example, providing high levels of customer-satisfaction could be the basis of a differentiation strategy—such firms make large profits because they target customers who are willing to pay a premium for these services (Porter 1980, 1985). Others point out that in industries highly dependent on long-term relationships and the ability to win added business, customer satisfaction could lead to superior profitability based on economies of scope—either inter-temporal or by cross-subsidization. This argument dominates the voluminous literature on buyer-supplier relationships, especially those that focus on customized products/services (for example, see the expansive treatments by Dyer 2000; Dyer and Singh 1998). Finally, studies in marketing and operations management argue that higher levels of customer satisfaction reduce customer management costs and costs of future transactions, both of which increase profits.

However, other studies argue that in the specific context of strategic services outsourcing, project profitability and client satisfaction may be incompatible. Several surveys of CXOs suggest that clients have multiple objectives in mind when they pursue strategic outsourcing relationships, including reduction in cost, improvements in quality, and innovation (e.g. Lewin et al. 2009; Couto et al. 2007). Unless there is agreement among senior management on the most important outcomes expected from outsourcing, such mixed motives result in poor performance, especially in terms of client satisfaction (Puranam and Srikanth 2007). Anderson et al. argue that it is difficult to optimize service-based businesses for both productivity and customer satisfaction. Their argument refines Porter's initial insight that activity systems that support efficiency militate against differentiation (Porter 1980, 1996). In addition, in most strategic outsourcing projects, managers are measured on both profitability and client satisfaction. Project valuation models often consider increased profit streams over the project lifecycle, and managers are pressed to find improvements in execution that could lead to incremental efficiency gains.

In other words, managers of strategic services outsourcing projects need to implement a set of managerial policies that simultaneously improve project profitability and client satisfaction. Prior theory does not agree on whether managers can indeed implement a set of policies that improve both objectives or whether such policies lead to improvements in one of the desired outcomes at the expense of decrement in the other. As far as we are aware, there are no studies of how managers optimize for multiple objectives in the delivery of strategic outsourcing services. This study aims for a preliminary investigation of this domain by examining how different types of service controls used in strategic outsourcing projects impact project profitability and client satisfaction.

1.2 Service Controls in Strategic Outsourcing Relationships

Control systems refer to the set of procedures that organizations use to monitor, direct, and evaluate organizational activities. Prior research classifies controls as outcome-based *output controls* or behavior-based *process controls*. Output controls monitor the final outcome of an activity and are used to influence directly the ends achieved whereas process controls monitor the inputs or behavior used to achieve the outcomes. Hence, they are used to influence the means used to achieve desirable ends. Challagalla and Shervani further disaggregate process controls into *activity controls* that specify the activities that must be performed on a regular basis to achieve task objectives and *capability controls* that specify the resources and skills required for good performance. Given that strategic outsourcing relationships are structured more as tight partnerships than arm's length contracts, we

assume several of the controls are bilateral controls that are jointly established through dialogue and negotiation to foster effective cooperation and coordination between the client and vendor.

1.3 Impact of Service Controls on Project Profitability and Client Satisfaction

Activity controls refer to the specification, monitoring and reporting of activities that the vendor is required to perform on a regular basis to execute the outsourced task. Examples include specification of standards or templates for process execution, checks for regulatory compliance, safeguards for classified or proprietary information of the client and vendor, etc. Activity controls positively influence service satisfaction in three ways. First, because of relatively greater uncertainty and complexity inherent to the outsourced task, strategic outsourcing initiatives are often governed by relatively incomplete variable price contracts, where the client bears the risk of any cost overruns. An asymmetry between the client and vendor on the true costs of executing the outsourced task and ensuing overruns increases the risks to the client of moral hazard and dissipation of gains through costly bargaining or privately favorable redistribution of ex post surplus. Several activity controls such as controlled access to proprietary information, allocation of responsibility for regulatory compliance, and frequent reporting on accounting of resources and assets act as safeguards against appropriation concerns of the client in the relationship. Therefore, they positively impact client satisfaction. Further, frequent monitoring and reporting of activities through activity controls are likely to make clients more aware of the effort expended in task execution, reducing information asymmetries and increasing client confidence. Such communication also educates the client about the challenges faced by the vendor and their efforts in providing services to client—potentially leading to the client evaluating the vendor against realistic expectations. Finally, activity controls necessitate frequent communication between the client and vendor regarding the outsourced task, furthering the vendor's knowledge of client expectations and processes, thereby, improving quality of service and client satisfaction.

Hypothesis 1a: An increase in activity controls positively impacts service satisfaction.

Activity controls are also likely to have a positive impact on project profitability. One of the benefits of activity controls is increased collection and analysis of information throughout the project. Prior work in buyer-supplier relationships suggests that increased information flow between the client and vendor client is likely to have several benefits including better monitoring of service delivery, faster recognition of pain-points, better coordination across different sub-projects, and improved feedback from the client leading to faster problem resolution (Dyer and Nobeoka 2000; Dyer and Singh 1998). All of these benefits yield lower

costs of ownership of the outsourced task. Activity controls that routinizes and codifies knowledge are likely to help the vendor and client achieve process improvements by facilitating learning by doing (Zollo and Winter 2002). Continual feedback and transfer of process knowledge enhance the vendor's understanding of the outsourced process to reduce rework and cost overruns. Since industry practice has evolved to vendors paying penalty contracts for missing prespecified performance metrics, swifter problem recognition and faster problem resolution are likely to enable the vendor meet expectations and avoid associated penalties. In addition, vendors have responsibilities related to legal and regulatory compliance. Breach of compliance requirements could lead to costly negotiation, divert management attention from improving operations, and cause reputation damage. Activity controls contribute to the bottom line by reducing the chances of non-compliance. For all of these reasons, we posit:

Hypothesis 1b: An increase in activity controls positively impacts project financial performance.

Capability controls refer to the specification of resources, assets or capabilities that the vendor draws on to execute the outsourced task. For instance, the client may specify that individuals involved in executing the outsourced task possess certain skills and education, or that certain service or research centers be included or excluded in execution of the outsourced process.

As we noted earlier, strategic outsourcing services are necessarily heterogeneous in their delivery, involve interdependencies between the client and vendor in task execution, and require client-specific resource investments to create value. In this study we specifically focus on one type of capability control—the use of service delivery centers located in emerging markets versus those in developed markets. On the one hand, emerging market centers are perceived as more likely to offer cost effective solutions when compared to developed market centers. On the other hand, developed market centers are perceived as more likely to have the market knowledge and in-depth understanding of a client's context, and in turn, more likely to be able to provide appropriate solutions to client needs on a timely basis.

Though cost efficiency is a consideration in most strategic outsourcing services, strategic outcomes such as innovation and the ability to partner with the client in providing timely solutions by understanding client needs are also likely to be very important concerns in these projects. For example, using a longitudinal survey of offshoring trends, (Lewin et al. 2009), scholars have argued that for strategic services, cost reduction is a comparatively less important priority for service provision than innovation. For this reason, clients may prefer service provision by delivery centers located in developed markets. Personnel in developed markets are more likely to be familiar with the client's business context and the current technological trends, and this "contextual common ground" helps the client and vendor personnel coordinate better. For these reasons, client satisfaction is likely to be positively (negatively) associated with the use of more developed (emerging) market centers:

Hypothesis 2a: An increase in the use of developed market centers for service delivery positively impacts service satisfaction.

Hypothesis 2b: An increase in the use of emerging market centers for service delivery negatively impacts service satisfaction.

However, the economics of offshoring depends on the replacement of expensive developed-market resources with less expensive resources in the emerging economies. Intuitively, this suggests that project profitability is likely to be associated with increased use of emerging market centers for service delivery. However, as several scholars have pointed out, sourcing complex strategic services from offshore locations is not easy because of the associated coordination costs (Srikanth and Puranam 2011). Some estimates suggest that coordination costs can eat up as much as 15–25 % of the expected savings from offshoring (Farrell 2005; Agarwal and Farrell 2003). In addition, plans to use emerging market centers for service delivery could lead to bargaining on the part of the client on costs, wiping out the profits expected from use of these less expensive resources. In addition, some studies have suggested that CXO's tend to be unhappy with their outsourcing arrangements when these complex coordination issues intervene with achieving the estimated cost savings (PriceWaterhouseCoopers 2005). In other words, the use of emerging market centers could potentially lead to a "double whammy"—leading to indifferent profitability outcomes coupled with reduced client satisfaction. Putting these arguments together, we posit:

Hypothesis 2c: An increase in the use of developed market centers or emerging market centers for service delivery has no effect on project financial performance.

Output controls refer to the specification, measurement and monitoring of outcomes of the outsourced process, often through detailed service level agreements and service level objectives in the contract. The greater the number of output controls, the more complete is the formal contract governing the outsourcing relationship. Firms self-select contractual completeness to minimize the economic tradeoff between *ex post* inefficiencies of more incomplete contracts and *ex ante* costs of design of more complete contracts. The key *ex post* contractual inefficiencies in strategic outsourcing initiatives stem from assumptions of opportunistic behavior and cost overruns in task execution that may be attributable to the complexity and dynamism of the outsourced task. These overruns are difficult to monitor or measure, thereby, resulting in asymmetry in understanding of the true costs of executing the outsourced task. In such case, potential dissipation of gains from risks of moral hazard, costly bargaining and privately favorable redistribution of ex post surplus may be significant. Notwithstanding the costs of bargaining, the prospect of redistribution of ex post surplus may also distort the vendor's ex ante incentives to make specific investments or expend resources to create value. Output controls protect the client against these inefficiencies by measuring vendor productivity and linking it to delivered service levels and performance benchmarks (Mani et al. 2011). For these reasons, more complete contracts comprising greater output controls are positively related to client satisfaction.

Hypothesis 3a: An increase in output controls positively impacts service satisfaction.

However, the decrease in ex post contractual inefficiencies is associated with an increase in ex ante contract design costs. Indeed, if contracting were costless, participant firms would expend effort to anticipate contingencies in the task environment that affect cost and demand overruns, design responses to these contingencies, and precisely implement these expectations in the contract. However, the costs of understanding and describing ex ante what the provider wants increases significantly in complex, dynamic task environments, as strategic outsourcing. Further, while more complete contractual environments limit the exposure of the client to risks of cost and demand overruns, the vendor must now bear this risk in more complete contractual environments. For both these reasons, we argue that more complete contracts comprising greater output controls are negatively related to project profitability. In brief, we expect:

Hypothesis 3b: An increase in output controls negatively impacts financial performance.

2 Background of Study and Data Description

2.1 Research Setting

We analyze archival data on 390 strategic outsourcing contracts signed by 194 US- and Canada-based firms during 2007–2009. The vendor for these contracts is a prominent strategic outsourcing services provider. The umbrella of services rendered to clients includes infrastructure management, business process management, and strategic IT initiatives, amongst others.

2.2 Data and Measures

Each year, the vendor performs a detailed survey of clients for its strategic outsourcing services to assess their satisfaction with various dimensions of their outsourcing engagement. To qualify for this survey, the contract must be active for at least 6 months. These surveys are administered to clients via an external research partner; direct contact between the vendor and client is not allowed. All clients who respond to the survey are assured that their responses will remain confidential and that results will be reported only in aggregate, thereby, addressing privacy concerns and minimizing potential bias in self-reported data. In interviews lasting an average of over 60 min, clients rank their satisfaction with various dimensions of the outsourced service such as quality of contracted services, quality of value added services, governance of the outsourcing relationship, the likelihood of continuing the relationship, and recommending the vendor to other clients.

The survey also takes into account vendor's responsiveness to the client's strategic IT initiatives, the vendor's awareness and appreciation of these initiatives, and the vendor's capability in taking suitable action in the design of services to attain the aforementioned strategic goals.

The vendor complements this survey of client satisfaction with a detailed monthly internal assessment of the financial performance, efficiency, and effectiveness of services delivered, comprising rankings of business controls used, financial health of the outsourcing contract and quality of service. The client approves the vendor's assessment of these service dimensions before they are recorded in the contracts database. These measures of client satisfaction and account health form the primary data inputs to our study. The structured process described above in garnering client satisfaction with the vendor alleviates potential bias that may otherwise reflect in the survey responses.[1] Measures of these constructs and their reliability are detailed below.

Satisfaction: Measures of service satisfaction in prior empirical research on outsourcing (Lee and Kim 1999; Poppo and Zenger 2002) have largely emphasized satisfaction with service quality based on the SERVQUAL instrument (Parasuraman et al. 1988). However, for strategic outsourcing, the focus of the outsourcing contract shifts from mere attainment of quality to value delivered, vendor initiated innovations, and whether tangible business outcomes were achieved through these outsourcing services. In keeping with this notion, the client survey for each of the 3 years in our dataset measures satisfaction with contracted services and value created beyond contracted measures of quality. The degree of satisfaction is measured by the client's response to eleven questions along a ten-point scale where '1' represents extremely dissatisfied and '10' represents extremely satisfied (Cronbach's alpha = 0.95). We use an average of these eleven parameter scores as our measure of client satisfaction (CSAT).

Financial Performance: The vendor tracks the financial performance (FIN_PERF) of the contract in order to gauge its financial health. The financial performance is measured along an eight-point scale where '1' represents accounts whose financial performance is extremely poor, and '8' represents contracts with excellent financial health. The questions used to assess the financial performance are globally agreed upon, such that there is parity in their interpretation. Financial performance is estimated through a rule based assessment of whether financial targets have been established for the contract (after taking into account the time elapsed since the start of the contract), whether the contract has been missing its targets in the past, and estimating whether the financial outlook for the account indicates that financial targets for the quarter and year will be met. The financial

[1] We also checked for the presence of common-method bias through Harman's single-factor test (Podsakoff and Organ 1986). All of the variables in our study were simultaneously subject to an exploratory factor analysis, and the results of the unrotated factor solution were examined. The absence of a single factor that explained a significant amount of variance in the data suggested that common method bias did not likely impact survey responses. We also used Cronbach's alpha to check the reliability of constructs.

assessment takes into account not just whether the account has met the specified financial targets, but also whether these have been met within the desired or predicted timelines and within a certain threshold of the contracted or target values. In cases where the contract's financial performance is low, the manager is required to provide details on any open issues that the contract is dealing with, and whose financial performance is declining.

Activity Controls: We operationalize activity controls as the usage of lean methods in service delivery (LEAN), and business controls (BIZ_CTRLS). The vendor has developed a set of lean practices in an effort to mitigate the risks and uncertainty inherent to delivering cognitively intense, strategic outsourcing projects from delivery centers located across the globe as well as reduce process redundancies and activities that do not contribute to customer value. If a contract leverages these practices, we code the dummy variable LEAN as '1' for the pertinent year.

Every outsourcing contract in our sample involves establishment of business controls for data privacy and security, effective financial and other regulatory compliance, reporting, disclosure, and operations. Each month, the delivery account manager assesses the effectiveness of business controls used in the contract. Checks are performed to assess whether procedures are documented, corporate instructions are complied with, project risk is effectively identified and managed, and control issues identified in prior audits have been closed. If not, the vendor assesses whether any steps to resolve the issue have been identified. Based on all these input parameters, the vendor ranks the business controls used in the contract along an eight-point scale where '1' reflects poor controls, '5' reflects average controls, and '8' reflects good controls.

Capability Controls: We operationalize capability controls as the use of emerging market (EM_CTR) service centers, and developed market (DEVM_CTR) service centers. With its global presence, the vendor can optimize service delivery from both cost and resource perspectives, using one or more global delivery centers to reduce the cost of ownership of the outsourced function. The vendor tracks the site or location from where the outsourced services are delivered. Using this information, we calculate the total number of emerging market centers (EM_CTR) and developed market centers (DEVM_CTR) involved in the delivery of the outsourced service each year.

Output Controls: Output controls are conceptualized in terms of completeness of the contract. In our study, we measure the extent of completeness of a contract for a particular year as the average number of service level agreements (SLAS) and service level objectives (SLOS) implemented during that year. An SLA is a contractual agreement outlining a specific service commitment contracted between the vendor and the client. SLOs refer to specific performance metrics in SLAs, such as response time, resource availability, or quality.

Service Quality: Prior literature points to the significant impact of service quality on client satisfaction. Although we do not hypothesize about the performance impact of service quality, we include this important construct (SQUAL) in our analyses. Various rules are systematically applied to rank the quality of the project along an eight point scale where '1' reflects poor quality, '5' reflects

average quality, and '8' is indicative of good quality. In particular, the survey takes into account SLA misses, allied penalties and major incidents in determining the score.

Other Controls: In addition to the main constructs in our study, we control for other potential differences in the outsourcing initiatives that may impact client satisfaction and project profitability, such as the relationship length (TENURE), total contract value (TCV), total number of service lines that the contract caters to (TOTAL_SVC_LINES), and total competencies that the contract draws on (TOTAL_COMPTNCS). Longer-term relationships are associated with greater relational embeddedness that complements the contract to positively impact satisfaction. Embeddedness also decreases transaction costs to increase profitability (Poppo and Zenger 2002). TCV, TOTAL_SVC_LINES, and TOTAL_COMPTNCS are indicators of the complexity of the contract (e.g., Susarla 2012). For instance, total number of service lines proxy for the umbrella of activities that the vendor does in the strategic outsourcing contracts examined in this study, such as network and infrastructure provision, customer relationship management, web hosting, etc. and is indicative of the complex nature of this contract. Total competencies refer to the distinct groups of skill sets in the firm—methods, processes, tools, and infrastructure—that the contract leverages for service delivery. We also control for the client's industry and country fixed effects (whether US or Canada).

3 Empirical Analysis and Results

We estimate the following model to test our hypotheses:

$$\begin{aligned} SAT_{i,t} = {} & \alpha_0 + \alpha_1.LEAN + \alpha_2.BIZ\_CTRLS + \alpha_3.DEVM\_CTR \\ & + \alpha_4.EM\_CTR + \alpha_5.SLOS + \alpha_6.SLAS \\ & + \alpha_7.SQUAL + \alpha_8.TENURE + \alpha_9.TCV \\ & + \alpha_{10}.TOTAL\_SVC\_LINES + \alpha_{11}.TOTAL\_COMPTNCS \\ & + \alpha_{12}.CONTROLS + \alpha_{13}.INTERACTIONS + \varepsilon_1, \text{ and} \\ FIN\_PERF_{i,t} = {} & \beta_0 + \beta_1.LEAN + \beta_2.BIZ\_CTRLS + \beta_3.DEVM\_CTR \\ & + \beta_4.EM\_CTR + \beta_5.SLOS + \beta_6.SLAS \\ & + \beta_7.SQUAL + \beta_8.TENURE + \beta_9.TCV \\ & + \beta_{10}.TOTAL\_SVC\_LINES + \beta_{11}.TOTAL\_COMPTNCS \\ & + \beta_{12}.CONTROLS + \beta_{13}.INTERACTIONS + \varepsilon_2. \end{aligned}$$

In the above equation, 'i' is each account and 't' is the year. We assume the error terms (ε_1 and ε_2) to be normally distributed and correlated across the two equations. We therefore report the results of a seemingly unrelated regression (SUR) model, estimated for the panel data.

It is possible that some of the predictor variables—LEAN, DEVM_CTR, EM_CTR, SLOs, and SLAs—are endogenous, resulting in biased and inconsistent estimates. However, we posit that these variables are not endogenous for two reasons. First, both the vendor and the client choose these contractual variables mutually. Such mutual selection thus, rules out any strategic choice exercised by the vendor. Second, we used the Durbin–Wu–Hausman (DWH) test to check for endogeneity in our model (Wu 1973; Hausman 1978; Greene 2000). We follow the approach outlined by Davidson and MacKinnon (1993); that is, we conduct an augmented regression test using the residuals from the suspected endogenous variables. The null hypothesis (H_0) is that the regressors are exogenous. Our test results show that none of the variables outlined above are endogenous; the p-values from the DWH test all exceed 0.1; thus ruling out endogeneity as a concern in our model.

4 Results

We report the summary statistics and pair-wise correlations between all variables used in our analyses in Table 1. We investigated potential multicollinearity problems by examining variance inflation factors (VIFs) and condition indices for the predictor variables. Near multicollinearity is a problem if VIF >10 (Neter et al. 1996) or the maximum condition index (CI) for the model >30 (Myers 1990). An analysis of these estimates confirmed that our models were not biased by multicollinearity. In addition, prior to the analysis, we computed z-scores for all the variables to account for measurement differences; this also mitigates collinearity concerns in the model due to interaction variables.

We report our population level results in Tables 2 (SAT) and 3 (FIN_PERF). We first estimate the baseline model without any interactions (Model 1), and subsequently add the interactions. Models 2 and 3 in each of Tables 2 and 3 report results of interactions of the controls (LEAN, BIZ_CTRLS, DEVM_CTR, EM_CTR, SLOs, SLAs) with TOTAL_SVC_LINES and TOTAL_COMPTNCS respectively. For reasons of brevity, we do not report the results for the interactions of the controls with TCV; these results are aligned with the other two measures of complexity. We also report the interactions of these variables with SQUAL. Model 4 in each table reports the results of the hierarchical Bayesian model at the population level, where in we estimate the $\overline{\alpha}_i$ and $\overline{\beta}_i$ for each draw, and then average it across the last 30,000 draws to obtain the reported coefficients. The results are largely consistent across the five specifications, and provide support for our hypotheses. For the sake of brevity, we discuss the results of Model 1 and Model 4 below, and comment on the significant interactions from Models 2 and 3.

H1 argued that an increase in activity controls positively affects client satisfaction as well as the project's financial performance. Our findings partially support this hypothesis; coefficients for both LEAN and BIZ_CTRL are positive and

Table 1 Descriptive statistics and correlations

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. FIN_PERF	6.57	2.09												
2. SAT	8.09	1.27	0.16											
3. SQUAL	7.54	1.02	0.33	0.19										
4. LEAN	0.71	0.44	− 0.04	0.11	− 0.03									
5. BIZ_CTRLS	7.89	0.42	0.20	0.28	0.41	0.08								
6. DEVM_CTR	1.30	1.04	− 0.14	0.01	− 0.08	0.20	− 0.13							
7. EM_CTR	1.31	1.25	− 0.21	− 0.17	− 0.12	0.19	− 0.16	0.51						
8. SLOS	10.70	19.90	− 0.17	− 0.08	− 0.28	− 0.01	− 0.07	0.10	0.13					
9. SLAS	23.84	28.52	− 0.27	− 0.12	− 0.26	0.00	− 0.18	0.11	0.18	0.14				
10. TENURE	3.85	3.96	− 0.02	0.12	0.08	0.12	0.00	0.00	− 0.14	− 0.06	− 0.09			
11. TCV	223.00	364.00	− 0.17	− 0.17	− 0.17	0.02	− 0.36	0.24	0.24	0.04	0.19	0.27		
12. TOTAL_SVC_LINES	15.61	6.38	− 0.15	− 0.11	− 0.16	0.12	− 0.22	0.36	0.44	0.19	0.19	0.13	0.42	
13. TOTAL_COMPTNCS	6.11	1.82	− 0.22	− 0.02	− 0.15	0.20	− 0.13	0.38	0.40	0.22	0.12	0.11	0.30	0.83

Notes TCV is measured in USD million. Tenure is measured in months

Table 2 Determinants of service satisfaction

	XTSUR results		
	Model 1	Model 2	Model 3
Activity controls			
LEAN	0.14** (0.04)	0.21* (0.10)	0.17 (0.13)
BIZ_CTRLS	0.26*** (0.03)	−0.04 (0.15)	−0.57 (0.32)
Capability controls			
DEVM_CTR	0.15** (0.05)	0.17** (0.05)	0.18** 0.06)
EM_CTR	−0.12* (0.06)	−0.11 (0.07)	−0.12 (0.07)
Output controls			
SLOs	−0.03 (0.04)	0.06 (0.07)	0.04 (0.07)
SLAs	−0.05 (0.06)	−0.02 (0.13)	−0.12 (0.16)
Service quality			
SQUAL	−0.02 (0.04)	−0.38*** (0.11)	−0.42*** (0.12)
Other control variables			
TENURE	−0.07 (0.04)	−0.03 (0.05)	−0.05 (0.06)
TCV	0.14 (0.08)	−0.20*** (0.06)	−0.24 (0.05)
TOTAL_SVC_LINES	−0.14* (0.07)	−2.25** (0.77)	0.19* (0.09)
TOTAL_ COMPTNCS	−0.21*** (0.05)	−0.21* (0.09)	−4.72*** (1.42)
Interaction of controls and service quality with service lines			
LEAN × TOTAL_SVC_LINES		−0.15 (0.13)	
BIZ_CTRLS × TOTAL_SVC_LINES		1.45* (0.71)	
DEVM_CTR × TOTAL_SVC_LINES		−0.07 (0.05)	
EM_CTR × TOTAL_SVC_LINES		0.05 (0.07)	
SLOs × TOTAL_SVC_LINES		−0.13 (0.07)	
SLAs × TOTAL_SVC_LINES		−0.03 (0.17)	
SQUAL × TOTAL_SVC_LINES		1.08*** (0.28)	
Interaction of controls and service quality with competencies			
LEAN × TOTAL_ COMPTNCS			−0.08 (0.16)
BIZ_CTRLS × TOTAL_ COMPTNCS			3.59* (1.40)
DEVM_CTR × TOTAL_ COMPTNCS			−0.09 (0.05)
EM_CTR × TOTAL_ COMPTNCS			−0.06 (0.08)
SLOs × TOTAL_ COMPTNCS			−0.07 (0.06)

(continued)

Table 2 (continued)

	XTSUR results		
	Model 1	Model 2	Model 3
SLAs × TOTAL_ COMPTNCS			0.15 (0.17)
SQUAL × TOTAL_ COMPTNCS			0.91*** (0.23)

Note N = 390, i ~ 1…194
*p < 0.10
**p < 0.05
***p < 0.01

Table 3 Determinants of financial performance

	XTSUR results		
	Model 1	Model 2	Model 3
Activity controls			
LEAN	0.01 (0.05)	−0.10 (0.11)	−0.18 (0.15)
BIZ_CTRLS	0.10* (0.04)	0.09 (0.17)	0.08 (0.37)
Capability controls			
DEVM_CTR	0.066 (0.05)	0.07 (0.06)	0.07 (0.06)
EM_CTR	−0.14* (0.07)	−0.13 (0.07)	−0.14 (0.07)
Output controls			
SLOs	−0.10* (0.04)	0.23** (0.08)	0.12 (0.08)
SLAs	−0.33*** (0.07)	−0.60*** (0.13)	−0.41** (0.16)
Service quality			
SQUAL	0.22*** (0.04)	0.61*** (0.13)	0.60*** (0.13)
Other control variables			
TENURE	−0.07 (0.05)	−0.08 (0.05)	−0.11 (0.06)
TCV	0.15 (0.09)	−0.05 (0.06)	−0.00 (0.05)
TOTAL_SVC_LINES	−0.19* (0.08)	0.93 (0.88)	0.18 (0.10)
TOTAL_ COMPTNCS	0.00 (0.05)	−0.23* (0.09)	0.37 (1.64)
Interaction of controls and service quality with service lines			
LEAN x TOTAL_SVC_LINES		0.15 (0.14)	
BIZ_CTRLS × TOTAL_SVC_LINES		0.12 (0.83)	
DEVM_CTR × TOTAL_SVC_LINES		−0.02 (0.06)	
EM_CTR × TOTAL_SVC_LINES		−0.02 (0.07)	
SLOs × TOTAL_SVC_LINES		−0.34*** (0.09)	
SLAs × TOTAL_SVC_LINES		0.41* (0.18)	

(continued)

Table 3 (continued)

	XTSUR results		
	Model 1	Model 2	Model 3
SQUAL × TOTAL_SVC_LINES		−1.00** (0.33)	
Interaction of controls and service quality with competencies			
LEAN × TOTAL_ COMPTNCS			0.25 (0.17)
BIZ_CTRLS × TOTAL_ COMPTNCS			0.15 (1.62)
DEVM_CTR × TOTAL_ COMPTNCS			−0.03 (0.06)
EM_CTR × TOTAL_ COMPTNCS			−0.00 (0.08)
SLOs × TOTAL_ COMPTNCS			−0.23** (0.08)
SLAs × TOTAL_ COMPTNCS			0.05 (0.16)
SQUAL × TOTAL_ COMPTNCS			−0.84** (0.26)

Note N = 390, i ~ 1…194
*p < 0.10
**p < 0.05
***p < 0.01

significant for satisfaction ($\alpha_1 = 0.14$, $p < 0.05$; $\alpha_2 = 0.26$, $p < 0.01$) while BIZ_CTRL is positive and significant for financial performance ($\beta_2 = 0.10$, $p < 0.1$). Our Bayesian estimation supports H1 ($\overline{\alpha}_1 = 0.114$, $p < 0.05$; $\overline{\alpha}_2 = 0.099$, $p < 0.05$; $\overline{\beta}_2 = 0.130$, $p < 0.05$). Therefore, the optimized delivery that lean methods facilitate ensures client satisfaction while also allowing the vendor to be more efficient (Harter et al. 2000). Business controls measure the efficacy of vendors' processes and initiatives towards improved data privacy and security, financial compliance and reporting, better complexity management, operations management, risk management, and asset management. Our results suggest that the informational benefits of these controls positively affect both client satisfaction and financial performance.

The evidence for H2 is more mixed. In H2a (b), we argued that the use of delivery centers located in developed (emerging) markets positively (negatively) affects service satisfaction. We find strong support for H2a but limited support for H2b ($\alpha_3 = 0.152$, $p < 0.05$; $\alpha_4 = -0.115$, $p > 0.1$) in model 1. We find full support for H2b in Model 4 ($\overline{\alpha}_3 = 0.147$, $p < 0.05$; $\overline{\alpha}_4 = -0.062$, $p < 0.05$).[2] The use of delivery centers located closer to the clients for implementing strategic outsourcing contracts reduces the geographic and cultural distance between vendor and the client, thereby increasing service satisfaction. We further argued that use

[2] Model 1–4 shows a negative but insignificant effect of use emerging market centers for delivery of strategic sourcing projects, and model 5 shows a negative and significant effect.

of either types of center would have no effect on financial performance. While this result is supported at the population level, results from Model 4 that accounts for client heterogeneity indicate that the use of developed (emerging) markets for service delivery positively (negatively) and significantly affect financial performance ($\overline{\beta}_3 = 0.147, p < 0.05$; $\overline{\beta}_4 = -0.062, p < 0.05$). Thus, it seems that although the use of emerging markets in service delivery would provide access to a vast pool of human capital at a lower cost of ownership, usage of such centers inhibit greater interdependence, shared understanding of the outsourced tasks, and shared control of the outsourced function that is necessary for strategic outsourcing. The ensuing maladaptation adversely impacts not only client satisfaction but also project financials, possibly through rework, penalties and lower cost efficiencies.

We find mixed support for hypothesis 3, where we argued that an increase in output controls, operationalized as contractual completeness, would positively (negatively) affect service satisfaction (financial performance).[3] We find that contractual completeness, as measured by the number of SLOs and SLAs is negatively associated with service satisfaction ($\overline{\alpha}_5 = -0.052, p < 0.05$; $\overline{\alpha}_6 = -0.103, p < 0.05$) and financial performance ($\beta_5 = -0.097, p < 0.1$; $\beta_6 = -0.334, p < 0.01$; $\overline{\beta}_6 = -0.191, p < 0.05$). This is likely because the suggested benefits of more complete contracts, viz. reduction in risk of appropriation concerns and ex post surplus, are offset by other costs in the case of strategic outsourcing. In particular, the ability of the client and the vendor to anticipate and specify contingencies in the outsourcing relationship through more complete contracts is limited, given the responsiveness of strategic business processes to changing business needs, necessitating greater strategic ambiguity and incomplete contracts (Bernheim and Whinston 1998). In such cases, much of the work is non contractible, and the business processes more dynamic. Therefore, contract completeness results in inflexible contractual clauses that are costly not only to design and write completely, but also result in costly renegotiation costs, resulting in lower financial performance and dissatisfied clients. For this reason, while output controls and greater contractual completeness are desirable in transaction intensive contracts, strategic contracts benefit from tight relational processes between the client and vendor that complement the contract to achieve mutually beneficial goals. Our results, thus, highlight the dichotomy between contract completeness and the need for complementary governance mechanisms such as joint action and other relational processes in their effect on service satisfaction and financial performance in strategic outsourcing contracts.

Interestingly, our findings in Model 4 show that the relationship length (TENURE) has a positive and significant effect on client satisfaction, but a negative and significant effect on financial performance. Therefore, while relationship

[3] We find that neither the number of service level agreements nor the number of service level objectives has any significant effect on service satisfaction or on financial performance in Models 1–4.

tenure may proxy for trust gained in the relationship and establishment of governance mechanisms such as joint action or collaborative conflict resolution that increase client satisfaction, it is also suggestive of inflexible pricing contracts that are unprofitable to the vendor in the long run.

Interestingly, we find that quality of service, though sharing a weak relation with satisfaction, has a significant positive impact on financial performance. It is likely that incentive contracts in outsourcing reward the vendor for meeting quality levels. However, meeting quality expectations in the relationship is a necessary, but not sufficient, condition for client satisfaction in strategic outsourcing. Effective management of service level objectives and responsiveness to major incidents associated with the account are integral to service satisfaction, rendering quality more of a hygiene factor. Further, as projects become more complex, catering to increased service lines and requiring larger number of competencies, it becomes unsustainable to provide the same level of quality, which is why we see negative interaction effects for SQUAL in Models 2 and 3.

Finally, complexity of the outsourcing initiative, as measured by the total service lines, has a negative impact on service satisfaction. Consistent with prior research, this emphasizes the potential dangers of loss in market and financial performance through the outsourcing of complex tasks; firms may thus be better off keeping complex organizational tasks in-house.

5 Discussion and Conclusion

Strategic outsourcing or the outsourcing of near-core functions is increasing, but the performance drivers therein are poorly understood. Strategic outsourcing initiatives involve significant uncertainty, complexity, and interdependence between the client and vendor. These contracts also typically exemplify the difficulty of optimizing for multiple performance objectives—in this case, for client satisfaction and project profitability. To our knowledge, our study is the first to understand how specific managerial actions impact both these outcomes.

Extant research on outsourcing, inspired by transaction cost economics, has largely focused on contractual control mechanisms. However, possibly due to paucity of relevant data, there is little empirical research that examines process and output control mechanisms or their performance consequences in strategic outsourcing relationships. Our study builds on existing literature in marketing and international business to provide an understanding of different types of formal controls in strategic outsourcing by clearly explicating, measuring, and testing the impact of activity, capability and output controls on service satisfaction and project financial performance within a single study. This study also contributes to control theory by testing the performance consequences of formal controls in an inter-organizational context.

Overall, our results support the hypothesized performance impacts of formal controls. We find that activity controls contribute significantly and positively to

client satisfaction and profitability. We find mixed evidence for capability controls and negative impact of output controls. Activity controls such as lean frameworks and business controls are particularly important for the success of strategic outsourcing relationships. Second, in these contracts, the process is near core to the clients' strategic objectives with little revenue distance; the clients often seek these strategic relationships to attain competitive agility and other transformational objectives and share strategic assets, knowledge, and resources with the vendor. Our results suggest that business controls that ensure regulatory compliance, information security, or data confidentiality, amongst others, lead to service satisfaction as well as to project profitability.

Moving on to capability controls, as expected, we find that the usage of development centers located in emerging markets negatively affects service satisfaction. In contrast, the use of development centers located in developed markets is positively associated with service satisfaction. Interestingly, we also find that though the use of developed market centers does not have a significant effect on project profitability, the use of emerging market centers has a negative effect. This suggests that clients (and perhaps vendor) may be underestimating the coordination costs of delivering strategic services across geographies (Srikanth and Puranam 2011; Agarwal and Farrell 2003), and therefore too aggressive reductions in revenues based only on the difference in factor prices across geographies.

Output controls, such as the number of SLAs and SLOs, have a negative effect on both service satisfaction and profitability. This potentially reveals the curse of too much measurement. The more the metrics measured, the more likely the shortfall in at least one of the parameters. However, even a minor infraction is likely to have a psychological effect on client satisfaction—since the vendor is not meeting standards—and perhaps also triggers penalty payments that hurt project profitability. Prior research in buyer-supplier relationships suggest that in complex sourcing contracts relational contracting is better than output contracting. Broad based information exchange on a variety of metrics and incentives for gradual improvement are likely to be associated with super performance and satisfaction rather than a more narrow "measurement" focus on output metrics.

Overall, our findings suggest that in the context of strategic outsourcing contracts, formal controls that manifest vendor's commitment to delivering value, innovation, and tangible benefits towards the attainment of clients' strategic goals would positively contribute to service satisfaction and successful outsourcing outcomes. However, management practices that improve client satisfaction need not always be correlated with project profitability—and the project managers have a tough job in deciding which controls to retain and which ones to discard, depending on their differential effects on these two objectives.

As with all research, our study is subject to certain limitations. We rely on data on North American clients from a single vendor, albeit a well-known provider of strategic outsourcing services. Our design also cannot track inter-temporal economies of scope—in profitability or satisfaction. Despite these limitations, we believe that this study makes an important contribution to control theory and the literature on performance of outsourcing relationships, especially looking at

sourcing relationships from the vendor's point of view. We hope that our study will generate further interest in the antecedents and consequences of different process and output control mechanisms in outsourcing relationships.

References

Agarwal, V., & Farrell, D. (2003). Who wins in offshoring. McKinsey Quarterly.

Argyres, N., & Mayer, K. J. (2007). Contract design as a firm capability: An integration of learning and transaction cost perspectives. *Academy of Management Review, 32*, 1060–1077.

Bernheim, B. D., & Whinston, M. (1998). Incomplete contracts and strategic ambiguity. *American Economic Review, 88*(4), 908–932.

Couto, V., Lewin, A. Y., Mani, M., Manning, S., Russell, J. W., & Sehgal, V. (2007). *Offshoring 2.0: Contracting knowledge and innovation to expand global capabilities. Companies seek intellectual talent beyond their borders*. Durham: Duke University, CIBER/Booz Allen Hamilton Report.

Davidson, R., & MacKinnon, J. (1993). *Estimation and inference in econometrics*. New York: Oxford University Press.

Dyer, J. H., & Nobeoka, K. (2000). Creating and managing a high performance knowledge-sharing network: The Toyota case. *Strategic Management Journal*, *21*(Special Issue), 345–367.

Dyer, J. H., & Singh, H. (1998). The relational view: Cooperative strategy and inter-organizational competitive advantage. *Academy of Management Review, 23*, 660–679.

Dyer, J. H. (2000). *Collaborative advantage: Winning through extended enterprise supplier networks*. New York: Oxford University Press.

Farrell, D. (2005). Offshoring: Value creation through economic change. *Journal of Management Studies, 42*(3), 675–683.

Gottfredson, M., Puryear, R., & Phillips, S. (2005). Strategic sourcing from periphery to the core. *Harvard Business Review, 8*(2), 2–9.

Greene, W. H. (2000). *Econometric analysis* (International edition). Prentice Hall, Upper Saddle River.

Harter, D. E., Krishnan, M. S., & Slaughter, S. A. (2000). Effects of process maturity on quality, cycle time, and effort in software product development. *Management Science, 46*, 451–466.

Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica: Journal of the Econometric Society*, *46,* 1251–1271.

Lee, J. N., & Kim, Y. G. (1999). Effect of partnership quality on IS outsourcing success: Conceptual framework and empirical validation. *Journal of Management information systems*, *15*, 29–61.

Lewin, A. Y., Massini, S., & Peeters, C. (2009). Why are companies offshoring innovation? The emerging global race for talent. *Journal of International Business Studies, 40*, 901–925.

Mani, D., Barua, A., & Whinston, A. (2011). An empirical analysis of the contractual and information structures in business process outsourcing. *Information Systems Research, 34*(1), 39–62.

Myers, R. H. (1990). *Classical and modern regression with applications*. Boston: PWS-Kent Publishing Company.

Neter, J., Kutner, M. H., Nachtsheim, C. J., & Wasserman, W. (1996). *Applied linear regression models*. Chicago: Irwin.

Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). Servqual: A multiple-item scale for measuring customer perceptions of service quality. *Journal of retailing, 64*(1), 12–40.

Podsakoff, P. M., & Organ, D. W. (1986). Self-reports in organizational research: Problems and prospects. *Journal of Management, 12*(4), 531–544.

Poppo, L., & Zenger, T. (2002). Do formal contracts and relational governance function as substitutes or complements? *Strategic Management Journal, 23*, 707–725.

Porter, M. E. (1980). *Competitive strategy*. New York: Free Press.

Porter, M. E. (1985). *Competitive advantage: Creating and sustaining superior performance*. New York: Free Press.

Porter, M. E. (1996). What is strategy? *Harvard Business Review, 74,* 61–78.

PriceWaterhouseCoopers. (2005). The evolution of BPO in India.

Puranam, P., & Srikanth, K. (2007, June 16). Seven myths about outsourcing. *The Wall Street Journal*.

Ring, P. S., & Van de Ven, A. H. (1994). Developmental processes of cooperative inter-organizational relationships. *Academy of Management Review, 19*, 90–118.

Srikanth, K., & Puranam, P. (2011). Integrating distributed work: Comparing task design, communication and tacit coordination mechanisms. *Strategic Management Journal, 32*, 849–875.

Susarla, A. (2012). Contractual flexibility, rent seeking, and renegotiation design: An empirical analysis of information technology outsourcing contracts. *Management Science, 58*(7), 1388–1407.

Wu, D. M. (1973). Alternative tests of independence between stochastic regressors and disturbances. *Econometrica*, *41*, 733–750.

Zollo, M., & Winter, S. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organization Science, 13*, 339–351.

The Post-Crisis Outsourcing Relationship: Building Institutional Trust, Technology and Regulatory Controls

Wendy Currie and Daniel Gozman

Abstract Following serious economic recession, government and industry attention on governance, risk and compliance has increased, causing a shift in institutional logics away from free markets towards enhanced supervision and regulation. This shift has created new regulatory institutions designed to enhance trust in transactions conducted through financial intermediaries on behalf of investors. The study explores how a major IT vendor implements an Investment Management System at eight global financial organizations over a 3 year period. The findings offer some interesting insights into the outsourcing relationship in building trust through regulatory controls for developing robust compliance practices both externally and internally. Our research finds, however, that dynamics of trust between investors, regulators and financial intermediaries may be undermined by persistent practices derived from pre-crisis institutional behaviours and logics.

Keywords Institutional logics · Institutional trust · Institutional theory · Great recession · Change management · Financial crisis · Compliance · Internal controls

W. Currie (✉)
Audencia-PRES LUNAM, Audencia School of Management, 8 Route de La Jonelière B.P, 31222-44312 Nantes, Cedex 3, France
e-mail: wcurrie@audencia.com

D. Gozman
Henley Business School, London School of Economics and Political Science, London, UK
e-mail: daniel.gozman@gmail.com

R. Hirschheim et al. (eds.), *Information Systems Outsourcing*, Progress in IS,
DOI 10.1007/978-3-662-43820-6_5

1 Introduction

Trust is integral to the operation of financial markets. Despite the extensive use of mathematical models within capital markets, finance is not physics, and so operates on trust and faith (Carlin et al. 2009). However, trust in financial organizations and regulatory institutions have severally diminished in recent times. At the societal level, there is considerable public anger regarding the origins of the Great Recession and the organizations and regulators who contributed to it. There is a perception that the public was 'sold a story' of the benefits of financial innovation and intensity which were untruthful and used to justify excessive bonuses. Many now believe that the financial services industry is characterised by deep rooted 'cynical greed' and 'malpractice' functioning on an increasing scale (Turner 2012). As Kramer (2012, p. 20) notes, 'human and systemic factors jointly contribute to failures of institutional trustworthiness.' Select examples of high profile scandals include the LIBOR manipulation scandal, the HSBC money laundering scandal, and Goldman Sachs deliberate misleading of investors (BBC 2012a; Gillespie et al. 2012).

The literature has lacked conceptualizations of institutional and organizational trust and explorations of how trust dynamics are influenced by micro and macro forces (Bachmann et al. 2012). Bachmann and Inkpen (2011) observe that empirical studies in the role of institutions in trust development are absent within the literature and so we adopt these queries as our research questions. We aim to make a contribution by highlighting the role of technology and shifting institutional logics in the development of institutional trust. Institutional logics makes an important contribution to the study by adding perspectives of conflicts between shifting logics each espousing different versions of rationality, this perspective leads us to question whether the new intuitional logics of regulatory supervision will be able to completely displace previous behaviours or whether logics of action associated with pre crisis institutions may persist and thereby sabotage trust relations.

Our motivation is to explore how new regulatory obligations may be operationalized through technology and consequently provide a means by which trust between organizations may be created or repaired. This investigation requires analysis of how adherence to new regulatory obligations can be demonstrated and assured through technological innovation. Our study explores a live case. Specifically, the use of an Investment Management System (IMS) to meet post-crisis regulatory requirements, at eight financial organizations operating within the investment banking and asset management spheres. The IMS constrains and enables trading behaviours through surveillance, monitoring and the automation of regulatory rules. The IMS enacts areas of regulation and aims to decrease the probability of breeches by applying technological controls, derived from regulations, to structure interactions between markets, traders and the organization's compliance function. As Gillespie et al. (2012, pp. 209–210) observe, 'structural reforms and institutional control mechanisms have played, and continue to play, the central role in responding to the failures in financial institutions.'

It is perhaps worth highlighting that our focus is not in investigating trust of the institutional regulations themselves, but on how inter-organizational trust is developed in the face of regulatory institutions. Trust in relevant institutions is often a precondition of inter-organizational trust (Bachmann and Inkpen 2011; Child and Möllering 2003). As a point of departure we assume that the new regulations are well designed and able to restore some faith in the financial systems. At the time of writing this assumption remains to be proven false or accurate as the new regulatory environment is still being formed and the implementation of new requirements is on-going and will be for several years. Thus, it is too early to judge the quality of post-crisis regulations. However, it is accepted that the creation of new regulations creates opportunities for new loopholes to be exploited and that regulations are reactive by nature. Regulators' abilities to foresee and prevent future scandals are limited. However, our interest is not in how trust in the regulator or the regulations may be developed but in the organizational conditions by which regulations may restore trust. Furthermore, a technical review of the post-crisis regulations' impact on macro-economic events and policy, legal issues and the design of complex financial instruments are perhaps best left to journals focused, on law, economics and finance. Instead, our focus is on understanding the organizational and social structures which underpin the realization of regulatory obligations and compliance. Thus, our study focuses on substantive over verbal actions for (re)building institutional trust, which as Gillespie and Dietz (2009) note is an under researched area.

This chapter is divided into four sections. In the Sect. 1 we discuss the theoretical foundations and concepts, which underpin our study. We delineate theoretical constructs relating to institutional logics, personal, impersonal and intuitional trust and relate them to the pre and post crisis environment. From these constructs we build a conceptual model of our research context. Next, we outline our research method. The Sect. 3 synthesises our findings and analysis. We begin by discussing the relevance of the IMS to the post-crisis environment before discussing each of the relationships identified in our conceptual model. Finally, the theoretical and empirical contributions are discussed and concluding remarks are drawn.

2 Theoretical Underpinnings and Key Concepts

Neo-institutionalism provides the theoretical foundation for our study. This theoretical perspective focuses on the antecedents and processes by which organizations affirm themselves and achieve legitimization as a consequence of their compliance with the institutionalized contexts of their environment (DiMaggio and Powell 1983; Meyer and Rowan 1977; Scott 2008). In the post-crisis environment where financial organizations are under increased media and governmental scrutiny an increasing priority for such organizations is to appear legitimate, credible and trustworthy (The Economist 2012). Financial organizations are facing challenges to

not only safeguard and in some cases rebuild their own reputations but that of the industry as a whole (Gillespie et al. 2012).

Scott (2008, p. 50) highlights regulative systems as a, 'vital ingredient for institutions'. Regulatory processes may be conceptualised as including rule setting, the inspection of organizations' conformity to these rules, monitoring and sanctioning. At the heart of regulatory institutions is the need to ascertain violations and set punishments (Scott 2008). Consequently, regulative processes aim to influence future behaviour through coercive mechanisms which may be formal, such as financial penalties, and informal, such as shaming activities often through the press.

Figure 1 provides a conceptual model of the study's key theoretical constructs and their relationships. The conceptual model delineates the trust relationships both personal and institutional which are empirically derived from our study. The model also highlights the individual, inter-organizational and institutional levels of analysis considered.

2.1 Personal and Impersonal Trust

North (1990, p. 54) observes that, 'If trust is too low in a society, savings will be insufficient to sustain positive output growth. Such a poverty trap is more likely when institutions, both formal and informal, which punish cheaters, are weak.' Following the crisis, we have seen a decline trading numbers. However, new financial mandates have been introduced which have considerable breadth and depth and aim to strengthen regulatory institutions and so rebuild trust (Gillespie et al. 2012).

Bachmann and Inkpen (2011, p. 284) provide a useful definition of institutional trust, '…institutional-based trust is a form of individual or collective action that is constitutively embedded in the institutional environment in which a relationship is placed, building on favourable assumptions about the trustees' behaviour vis-à-vis such conditions.' Thus, institutions are conceptualised as providing architectures for facilitating the efficient coordination of expectations and interactions between either individuals or collective actors, functioning within organizations.

Franks et al. (2009) note that prior to the 1920s equity markets developed on the basis of informal trust relations rather than formalised systems of regulation. They highlight how in the beginning of the 20th Century, share ownership was geographically concentrated and firms' directors were keen to develop and maintain relationships with local shareholders. The reputation of individuals was paramount as there was little legal recourse available to shareholders. The analysis suggests a micro-level model of trust where frequent contact between trustees and trustors allows for the development of a state of mind which allows the cultivation of trust. Their findings align with Rousseau et al. (1998, p. 395) influential definition of trust, 'Trust is a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behaviour of others'. However, Franks et al. (2009) conclude that as local trust relations became

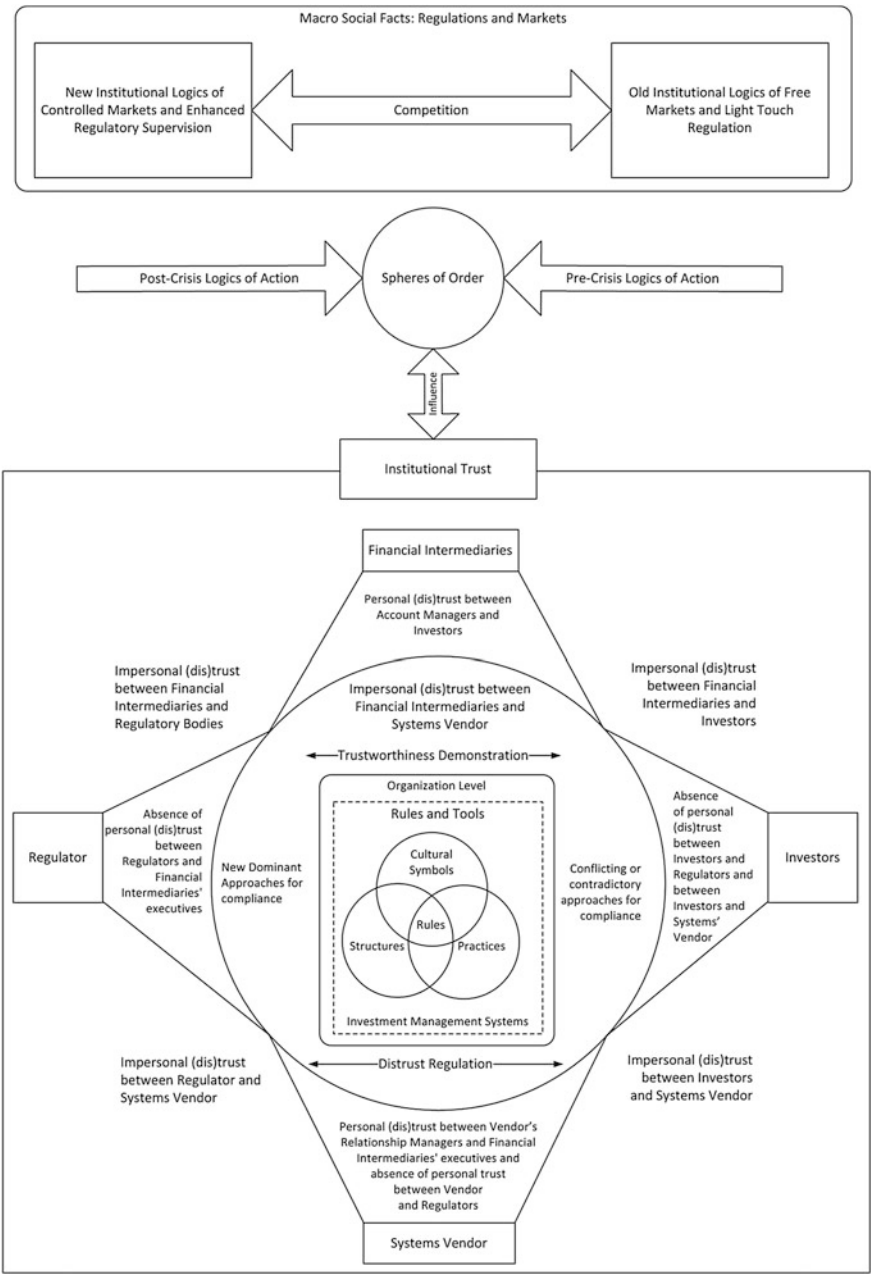


Fig. 1 Regulation influenced trust relationships in the context of IMS adoption

unsustainable they were substituted by formal systems of regulation. Thus, trust in macro regulatory frameworks substituted for micro trust in individuals.

In recent times the financial services industry has undergone much change. Factors which have contributed to a dynamic business environment include globalization, the impact of outsourcing and offshoring, the consolidation of financial organizations at both the national and global level, the adoption of algorithmic trading, increased levels of financial innovation and the development of complex credit securities and, not least, the widespread adoption of information focused technologies. These factors have contributed to capital markets becoming more open and integrated and so opportunities for trust to be developed through regular interaction have become diminished. As socio-economic systems develop and became advanced interaction based forms of trust become less relevant due to the time and resources necessitated by repeated face-to-face contact (Bachmann and Inkpen 2011). Consequently, contemporary socio-economic systems are reliant on impersonal trust as differentiated societies requires faith and trust in specialists to whom we have little opportunity to frequently interact and so develop a personal relationship (Giddens 1986; Luhmann 1979; Zucker 1986). These scholars argue that the reason that such specialists are trusted is that their behaviours conform to established systems and institutional norms, such as regulations or professions.

Financial transactions are characterized through asymmetric information and understanding (Greenwald and Stiglitz 1994). Within financial services borrowers, such as US firms seeking to raise revenues through issuing corporate bonds or equities may never have opportunities to meet potential investors whom may be geographically located in other parts of the world and so both parties trust in organizations such as investment banks and asset management houses to act as intermediaries and ensure that deals are conducted properly and that each parties' interests are protected. Corporation executives may have difficulty in understanding if their initial public offerings are being appropriately structured and marketed. Often investors have little understanding of the securities they are buying, the firm issuing them and the financial intermediaries selling them. Corporate treasurers may often have difficulties dissecting the numerous risk management solutions available and determining the solutions' level of effectiveness once deployed. Parties involved in acquisitions or mergers often also have incomplete information (Morrison et al. 2012). Consequently, in each of these contexts intermediaries are relied upon to provide sound guidance and unbiased advice. In 2010, Goldman Sachs was fined $ 550 million by their regulator, at the time the largest fine of its kind, for misleading investors by failing to disclose they were also working with a hedge fund on the other side of the deal who was targeting debt instruments which held strong ratings but nevertheless was likely to default (BBC 2010; Gillespie et al. 2012).

In summary, financial intermediaries rely on their reputations to reassure clients that they will behave appropriately and are adhering to relevant institutional values. Trust derived from personal interaction is not possible where opportunities for such interactions are reduced and where transactions are characterised by

asymmetric information. In these cases, trust is derived from the trustees' adherence to institutional norms, which underpin confidence and faith that expected outcomes will be achieved.

2.2 Competing Institutional Logics of Free Markets and Regulation

The institutional logics perspective approaches the challenge of institutional analytics by exploring the demarcating content and meanings of institutions. It focuses on how practice is shaped by how organizations and individuals are influenced by different institutional spheres of order each espousing a differing view of rationality. Institutional logics are demarcated as being beyond mere strategies or logics of action but in addition provide legitimacy and a sense of order and so typically function at the macro level. The change in the macro regulatory landscape, following the financial crisis, has clearly created new logics of action and strategies, which focus on legitimatizing and building trust in firms through compliance with the newly created order (Ocasio 1998; Thornton and Ocasio 1999, 2008; Thornton et al. 2012). Within the context of this study, established institutional orders for conducting transactions and meeting regulatory obligations are being challenged by changes in the regulatory environment as new practices compete for dominance over historically embedded approaches. A key assumption is that behaviours are located within specific institutional contexts, which act to regularise actions while providing opportunities for agency and change. Thus, institutional logics are defined as, 'the socially constructed, historical patterns of material practices, assumptions, values, beliefs and rules by which individuals produce and reproduce their material subsistence, organize time and space and provide meaning to their social reality' (Thornton and Ocasio 1999, p. 804).

Changing public expectations has created pressure on the state to deinstitutionalise outmoded approaches to regulating financial organizations. In 2010, the Managing Director of Supervision at the FSA, the UK regulator, advised that prior to the financial crisis, '…the FSA rarely intervened until it was clearly evident that something had gone wrong. Intervention needed to be based on evidence that risks had crystallised. The old approach was never going to stop firms making mistakes, as that was not its intention. This approach was of course the mandate for the FSA set by the City and society at that time' (FSA 2010a). Prior to the financial crisis the FSA, adopted a principles based or 'light-touch' approach to regulation. This approach was contrary to a prescriptive approach to regulation and allowed firms to, '…have increased flexibility in how they deliver the outcomes [the FSA] require' and focused on, '…moving away from dictating through detailed, prescriptive rules and supervisory actions how firms should operate their business' (FSA 2007a, p. 4, 6). However, 2009 saw 'principles-based' approaches to

regulation abandoned in the wake of the financial crisis. The Chairman of the FSA, Lord Turner, announced a move towards 'intense supervision' (FSA 2010a; Turner 2009a, b). This new practice requires a far more proactive approach by the regulator and seeks to actively influence outcomes as opposed to merely reacting to events.

As a consequence of reduced margins, industry restructuring regulations and enhanced supervision by regulatory bodies we are observing, post-crisis, a change in the institutional logics which legitimise the practices and institutional arrangements around which trust is formed. Previous studies which investigate institutional logics emanating from the field level have emphasised the existence of competing logics (Thornton and Ocasio 2008). Scholars have observed that, prior to the crisis; there was a move away from regulation towards self-regulation of free markets (Gillespie et al. 2012; Munir 2011; Thornton et al. 2012). We argue that post-crisis there has been a shift in institutional logics aimed at decreasing economic risk in the financial systems through strengthening regulatory frameworks. Consequently, pre-crisis institutional arrangements and associated logics of action for structuring compliance practices are being questioned and reconfigured. Consequently, there is now competition between pre and post-crisis institutional logics and conflict between the practices derived from them.

2.3 Reconstructing Compliance Through Technology

As a result of on-going regulatory changes the BBC's business editor succinctly notes, '…banks will in the coming 5 years be forced to undergo significant financial, cultural and managerial reconstruction.' (BBC 2012b, p. 1). Shifts in high-order institutional logics, at the macro level, are causing intra-organizational shifts in logics of action for organizing practice resulting in the reconstruction described. A key meta-theoretical principle of the institutional logics perspective focuses on how each institutional order comprises both cultural symbols and material elements which may be intertwined and mutually constitutive (Thornton et al. 2012). Material aspects refer to structures and practices, while symbolic elements relate to ideation and meanings drawn from culture. Cultural symbols may be embodied in structures and practices. Conversely, structures and practices may express and affect the ideation and meaning of cultural symbols (Zilber 2008). Within, the context of this study, we argue that practices, structures and cultural symbols associated with competing pre and post crisis institutional logics are embedded and reflected within technological systems, such as the IMS.

Organizational change and the transformation of practices and culture through technology use is well documented (see for example, Coombs et al. 1992; Ezzamel 1994; Orlikowski 1996; Volkoff et al. 2007; Weick 1990). Essential to the reconstruction process will be the effective utilization of technological infrastructures to support new organizational processes and routines (Cule and Robey 2004). Technology has a key role to play in facilitating change by applying

disciplinary effects to enable or constrain practices and thereby produce new patterns of action for meeting compliance (Labatut et al. 2012). The IMS which provides the context of this study is a sound example of a system which embeds regulatory rules by inscribing them into automated rules. These automated rules govern transactions and thereby both constrain and enable trading behaviours and so facilitate demonstrable compliance with post crisis mandates. The system provides aggregated views of firm-wide positions held by the organization thereby allowing enhanced risk management capabilities. The absence of such firm-wide perspectives was a contributing factor to the collapse of Lehman Brothers (McDonald and Robinson 2009).

Another key meta-theoretical principle of the institutional logics perspective is that organizations are historically contingent. Thornton et al. (2012) highlight changing regulatory frameworks as an exemplary case. As regulations change and develop over time they alter organizational arrangements and logics for selecting such arrangements. Furthermore, studies of organization and economic phenomena may be contingently valid only for that time period (Freidland and Alford 1991). This is an important distinction. At the time of writing many of the US and EU's regulatory responses to the financial crisis are still being crystallised and implemented. Furthermore, institutional orders may vary in importance over time and that the increasing influence of one institutional order may not necessarily act to replace another. While new institutional arrangements may prescribe a dominate logic of action these may cohabit with other arrangements which may have been created at different points in time under different historical contingencies (Streeck and Thelen 2005). Consequently, we argue that for organizations to truly demonstrate change and thereby repair trust, logics of action emanating from pre-crisis institutional logics must be displaced. Displacement, as a mode of institutional change refers to the removal of existing rules and practices and the introduction of new ones. Systems such as the IMS aim to enable such displacement through transcribing and encoding post-crisis regulatory rules and thereby constrain and structure behaviours to ensure appropriate outcomes. We argue that the use of such systems embeds in organizations institutional logics which, 'provide the formal and informal rules of action, interaction, and interpretation that guide and constrain decision makers in accomplishing the organisation's tasks and in obtaining social status, credits, penalties and rewards in the process' (Ocasio 1998, p. 196).

2.4 Repairing Reputations and Institutional Trust

We argue that key to repairing trust in financial organizations is their ability to meet post-crisis regulatory obligations by managing the required reconstructions stipulated by new regulatory mandates Gillespie et al. (2012) utilise Gillespie and Dietz (2009)'s Organization Level Trust Repair (OLT) Framework and apply it to the context of the financial crisis. This framework is multilevel; a system based and focuses on, 'understanding organizational trustworthiness and the process of

restoring an organization's reputation for trustworthiness (Gillespie et al. 2012, p. 195). We find a number of constitutive concepts embedded within this framework relevant to our own context, IMS, and our corresponding analysis. Of key relevance to our research context is the concept of 'distrust regulation' and 'trustworthiness-demonstration'. Distrust regulation refers to mechanisms for discouraging and preventing practices, which may contribute to future acts of untrustworthiness. Gillespie and Dietz (2009, p. 134) observe, 'Distrust regulation interventions are designed to modify the organization's dysfunctional components and errant interactions and event cycles that contributed to the failure, replacing them with a new 'admissible range' of behaviours. This mechanism involves implementing sufficient regulatory controls to prevent or constrain organizational members and groups from acting in ways that could lead to future violations, including the removal of incentives that may encourage untrustworthy behaviour.' We argue that trust repair emanates from the adoption of robust practices, rooted in new regulatory institutions, for constraining trading behaviours.

Within the context of our study, we apply these concepts not to organizations which have committed transgressions and are therefore looking to retrospectively regulate distrust by applying remedies in the form of controls. Instead we modify this concept and apply it to organizations which are being coerced into observing new regulatory mandates (designed to repair the trustworthiness of financial organizations and the industry as whole) and therefore must apply appropriate mechanisms to ensure compliance with these obligations. These mechanisms require the reconstruction of organizational processes and systems to ensure effective controls. Thus, we conceptualise this process as the opportunity to build trust by applying competent, stable and consistent controls for meeting regulations in order to ensure long term effective compliance. In summary, the concept of 'distrust regulation' suggests that rules, controls, governance and structures are all foundational to trust development. Furthermore, trust development may be facilitated through demonstrations of trustworthiness which display appropriate behaviours and competence.

The concept of trustworthiness-demonstration addresses the need to go beyond the removal of negative expectations and, 'is about the positive promotion of renewed trustworthiness through behaviours and verbal responses that actively demonstrate ability, benevolence, and integrity.' (Gillespie and Dietz 2009, p. 134). Within the context of our study we conceptualise this approach as the need to demonstrate to stakeholders' through behaviours and practices that robust compliance practices have been adopted. Our study explores the potential of technology and more specifically the IMS to facilitate such controls and demonstrate trustworthiness through the automation of regulatory rules.

Demonstrable adherence to new institutional logics of action relating to genuine moves away from practices associated with free market logics, may go some way to rebuilding the social status of financial intermediaries and correspondingly the trust in such organizations. Such a move must go beyond mere ceremonial or superficial compliance and instead move towards the wholesale supervision and necessary constraint of practice, where searching for regulatory arbitrage and

loopholes is discouraged by senior management (Turner 2012). Such a move will clearly require cultural transformation. Previous studies have highlighted the role of technology in facilitating culture change through structuring practices and so this study explores the potential for technology to contribute to cultural change by both enabling and constraining trading behaviours (Doherty and Perry 2001; Doherty and Doig 2003; Leidner and Kayworth 2006). Furthermore, organizations must be able to demonstrate that the logics of action for structuring compliance and trading activities, associated with pre-crisis free market institutional logics, have been displaced and do not persist and conflict with post-crisis practices associated with institutional logics of regulated markets. Technological infrastructures are essential to this process as they constrain and enable new organizational processes and routines, by applying controls, which govern trades and allow for demonstrable compliance through monitoring and reporting firm wide.

If organizations are able to demonstrably prove that they have applied adequate controls to ensure compliance with post-crisis regulations then inter-organizational trust may develop. Firms which have admirable traits such as trustworthiness and reliability often conform to practices that are appropriate and culturally desirable and thereby build reputations (Kraatz and Love 2006). Reliance on reputational information is particularly important where transactions are characterised by uncertainty and asymmetric information (Kramer 1999). Furthermore, Alan Greenspan (2008, p. 4) former Chairman of the Federal Reserve System, commented that, 'In a market system, based on trust, reputation has a significant economic value. I am therefore distressed at how far we have let concerns for reputation slip in recent years.'

In summary, the IMS represents a substantive response to repairing trust through principles of 'distrust regulation' and 'trustworthiness-demonstration'. As Gillespie et al. (2012, p. 201) note, 'Only if investors and other stakeholders see strong forms of rules and norms in place will they regain trust in organizations in the financial sector.'

3 Research Method

To gain deep insights into the institutional effects and processes within the post-crisis financial sector we carried out field-work across nine organizations. Using a semi-structured interviewing technique, in-depth interviews were carried out at the systems vendor site, in addition to eight client sites, all of which had introduced the IMS. Our objective was to elicit views and comments from interviewees engaged in the adoption and implementation of the IMS at client and vendor sites at both the technical and industry levels. Interviewees provided rich and insightful responses to questions about the post-crisis environment in financial services and also about the use of information technology for governance and compliance. Organizations engaged in asset management and investment banking activities were selected as the research focus, as these business areas require the frequent

trading of financial securities and so are heavily impacted by post-crisis regulation for capital markets. The study is explorative and aims to provide insight into typical cases of IMS usage at top tier financial institutions. Smaller organizations were rejected as potential data sources as they often trade fewer types of financial securities and correspondingly, are exposed to a narrower range of regulatory obligations. In addition, smaller organizations have lower trading volumes and so are less dependent on complex systems, such as the IMS, to track transactions. The focus of our study was on large financial organizations with global operations, trading diverse financial security types. Our adoption of a 'typical case' sampling strategy required a search for information-rich cases which were illustrative of IMS usage in such organizations (Patton 1990). The IMS Vendor was selected under the criterion of being one of the market leading providers of IMS, whose customer base met our sampling criteria.

In addition, criteria for selecting the IMS vendor's clients focused on identifying typical cases. Those considered included organizations which were using the IMS to manage comparable financial products and services and thus had a similar level of regulatory exposure and were also long term adopters of the system, utilising it for a minimum of 10 years. The financial organizations participating used the IMS for trading equities, derivatives, fixed income and currency securities. Long term adoption of the system was a necessary sampling criterion to ensure that IMS related practices were embedded within each organization. Consequently, participant individuals had a perspective of how the system has changed or failed to change behaviours as it facilitates post-crisis regulatory compliance. Primary data collection was achieved through semi-structured interviews at both vendor and client sites with question schedules formulated from the theoretical constructs previously described. The aim of data collection activities was to develop a rich picture of the IMS and associated working practices, post-crisis, not to perform a comparative analysis of how these organizations utilize the IMS. At the vendor site senior systems consultants and client relationship managers were interviewed. This was especially insightful as collectively they had much experience of implementing IMS and dealing with clients, post and pre crisis. Within the financial organizations, compliance and systems experts were interviewed. In total, forty-two interviews were conducted with individuals from the system vendor, as well as the eight financial organizations. These interviews were conducted over three phases from 2009 to 2012. Thus, the study adopts a longitudinal approach contextualised in a real, field setting. Such an approach is advocated as an appropriate method for investigating institutional trust repair in the post-crisis environment (Gillespie et al. 2012). Furthermore, this approach provided perspectives of how shifting institutional logics and associated logics of action were altering compliance and trading practices. Typically, interviewees were re-contacted during transcription and analysis in order to provide clarification on key issues. Scope, depth and consistency were achieved by discussing key concepts, constructs and terminology with each of the informants and triangulating the findings across primary secondary and external data sources (Flick 1998; Seale 1999).

During the process of data analysis primary and secondary data were closely reviewed to determine points of importance and interest. Common themes were identified and categories assigned. Thus, long interviews were simplified through the adoption of simple categories (Punch 2005). Initially, the research key outlined categories which relate to the theoretical constructs outlined in the Sect. 2.4. These categories of meaning were derived through the construction of a research key (Grbich 2007). Established categories included, 'Personal Trust', 'Impersonal Trust' and 'Trustworthiness Demonstration.' The analysis adopted a two cycle approach to coding. The first cycle adopted a 'Structural Coding' approach for summarizing segments of data. This approach is appropriate for exploratory studies utilising semi-structured protocols (Saldana 2009). This approach requires the application of a content phrase, to a segment of data, representing a topic of inquiry. For example, 'Trust between Investors and Financial Intermediaries'. The second cycle adopted 'Pattern Coding' approach to identify major themes by searching for causes and explanations from the data. Such an approach builds on the first cycle of analysis and are, 'explanatory or inferential codes, ones that identify an emergent theme, configuration or explanation. They pull together a lot of material into more meaningful and parsimonious unit of analysis' (Miles and Huberman 1994, p. 69). Examples of such codes include, 'Winning New Clients' 'IMS Post-Crisis Strategy' and 'Adoption of Core Systems'. In this way, key issues and experiences were highlighted, isolated and related to the study's theoretical underpinnings. The key was expanded as more transcripts were collected and considered after each research phase.

4 Contextualizing Investment Management Systems Usage

The European Union's response to defining post crisis regulations and achieving the stability of firms operating within capital markets has been fragmented.[1] In contrast, the US has opted to develop a single sweeping 2,319-page piece of legislation known as the Dodd-Frank Wall Street Reform and Consumer Protection. Within this sector, this scale of financial reform has not been enacted since the Great Depression (The Economist 2010). Global organizations with operations in the EU and the US will be subject to the regulatory requirements of both areas. For example, a global investment bank with operations in the UK and the US will be subject to the jurisdiction of UK and US regulatory bodies.

[1] Including the Alternative Investment Fund Managers Directive (AIFMD), Capital Adequacy Directive IV (CAD IV), European Market Infrastructure Regulation (EMIR), Markets Abuse Directive II (MAD II), Markets in Financial Instruments Directive II (MiFID II), Undertakings for Collective Investment in Transferable Securities Directive IV & V (UCITS III, IV & V), Packaged Retail Investment Products Regulation (PRIPS) and Regulation on Short Selling and Credit Default Swaps.

The post-crisis regulations will oblige organizations to set limits on specific types of transactions, calculate exposures to certain instruments, calculate risk and collateral values, perform pre and post-trade analysis, have the ability to perform audits, quickly report executed trades to the market and facilitate the clearing and settlement of transactions. Furthermore, these regulatory rules, to which financial organizations must adhere, are applied on a transaction-by-transaction basis. These mandates require systems to impose structured rules to constrain the financial organization's activities to ensure compliance. For example, the post-crisis EU Alternative Investment Fund Managers Directive requires that a private equity or hedge fund which holds a designated number of controlling or voting shares in a company must make public the identity of the Fund Manager, as well as its policies for managing communications and conflicts between the fund and the company. In order to comply with these requirements it is essential that the Fund has appropriate systems, such as the IMS, in place to monitor the number of voting shares held against the number required to exercise 'control' over the firm. To summarize, systems are required which enable the trading of various currencies and asset classes and aggregate the positions held in accounts and portfolios to ensure the organization's total holdings are compliant.

The IMS allows different individuals to collaborate on the purchase or selling of securities. Senior Managers in charge of investment strategies select the securities to be bought or sold and so create orders which are passed on to the traders who execute the transactions, while compliance executives monitor transactions and rule breeches and sign off trades. Database administrators are required to manage the large volumes of data required by the system. Regulations and legal mandates defined by organizations such as the Financial Services Authority in the UK (FSA) or the Securities and Exchange Commission in the US (SEC), are interpreted, translated and codified by compliance executives and systems experts into 'automated compliance rules', which are then inscribed into the IMS and applied on a transaction-by-transaction basis. That is, each transaction must be compliant with the relevant regulatory requirements and so the corresponding automated rules are run against each transaction. As a senior compliance professional noted, 'we're very much, sort of coders of quantitative restrictions for investment compliance'. Typically these 'quantitative restrictions' or calculations put limits on the numbers of securities traders may buy or sell. The IMS provides an interface for designing and building rules in-house. In addition, the IMS vendor provides example standard rule libraries to assist with rule creation. These pre-written 'automated compliance rules are based on key requirements for compliance with regulatory bodies in different geographies, such as the UK. In order for these rules to function properly they often require data from sources external to the IMS, to feed parameters required for performing calculations. An example is financial market data derived from media providers such as Bloomberg or Thompson Reuters. The quantity of rules may be vast. One financial organization had upwards of twenty-five thousand rules.

The next sections provide a summary of the interviews conducted and associated findings and analysis in relation to the trust relationships outlined in Fig. 1.

4.1 Trust Between Financial Intermediaries and Investors

As a result of the shift in institutional logics from free markets to intense supervision, our findings suggest that investors are becoming increasingly focused on the ability of financial intermediaries to demonstrate robust compliance practices. The research revealed that clients of the IMS now perceive demonstration of robust practices through the adoption of automated compliance systems, such as the IMS, as critical. In the post-crisis world, investors see the use of such systems as a legitimate means to ensure regulatory compliance. The IMS acts as a standard to help assure investors that their financial interests will be safeguarded through compliant behaviours. A senior compliance manager commented on how the IMS facilitates the need to demonstrate robust compliance processes in wining new business and also in reassuring existing investors.

The study found that personal trust between account managers and investors complimented institutional trust dynamics. Personal trust was deemed particularly important in maintaining the relationship, during periods of economic unrest.

Trust between the financial intermediaries and the investors, is partly enabled by the IMS ability to meet post-crisis regulatory obligations by incorporating required norms structures and procedures to ensure compliance. This finding supports Bachmann and Inkpen's (2011, p. 288) observation that, 'trust is developed by references made to strong and reliable institutional arrangements in which a relationship is embedded.' They suggest that institutional arrangements may facilitate trust in two ways. Firstly, institutional arrangements may influence actor's behavioural antecedents and so provide meaning and credibility to their circumstances before the relationships develops. In this way, institutional influences may affect the trustors' decision to invest in the relationship or walk away. The findings show, that in the post-crisis environment, the demonstrable adoption of the IMS is an important factor in both winning new business and maintaining trust with existing clients, as frequent due diligence checks are conducted. The adoption of IMS signals to both potential and existing investors that appropriate processes underpin compliance with regulatory institutions. Thus, the financial intermediary's behavioural antecedents are targeted by stable and consistent practices for managing regulatory adherence.

The second way in which Bachmann and Inkpen (2011) suggest that institutional arrangements may facilitate trust is after the decision to develop the trust relationship has been taken by the trustor. Following the decision to invest in a relationship, institutions may offer templates for interaction, which may allow the further development of trust. Both pre and post crisis regulations aim to structure interactions between financial intermediaries and investors by stipulating the financial intermediaries obligations, required levels of service as well as the information provided and the format of its presentation.[2] However, within the context of IMS adoption, the system acts not to build trust by structuring institutionalised patterns of

[2] The FSA's 'Treating Customers Fairly' initiative aims to enact these principles (FSA 2011).

interaction between the firm and investors but instead acts to build trust by channelling the behaviour of financial intermediaries and ensuring such behaviours are underpinned by tight regulatory controls. Thus, the IMS ensures that patterns of interaction between firms and the markets, conducted on *behalf* of clients, will be underpinned by strong and reliable regulatory controls. This finding builds on Bachmann and Inkpen's (2011) analysis and introduces the concept of institutions' building trust by suggesting that actions undertaken by the trustor on behalf of the trustee will be structured by competently adhering to institutional norms. The trust is built not through faith in the actual regulations, although this is a prerequisite, but by trusting the arrangements undertaken by the firm to enact institutions and thereby structure patterns of interaction conducted on the investors' behalf. Compliant interactions with markets may be achieved by means other than IMS adoption, through spread sheets for example, but such an approach may provide little confidence that long term compliance will be maintained.

4.2 Trust Between Financial Intermediaries and the Regulator

The study revealed the existence of competition between competing practices associated with pre and post crisis institutional logics. As a result of shifts in institutional logics towards 'intense supervision' several of the research participants observed the regulator taking a heightened interest in the types of systems adopted. The research findings highlight a tension between the acceptability of managing trading practices through manual systems of compliance, such as spread sheets or through automated systems such as the IMS. Another area of contention is between the adoption of a core firm-wide system for compliance and the use of disparate systems across various geographic regions or trading desks.

As a consequence of the regulator's change in approach, there has been a push to adopt core systems such as the IMS and thereby displace older practices and cultures derived from pre-crisis logics. The findings suggest that post crisis, organizations are being encouraged to move away to consolidate disparate systems, which complicates the outsourcing relationship yet further. The FSA handbook which outlines regulatory requirements states that, 'firm's arrangements should be such as to furnish its governing body with the information it needs to play its part in identifying, measuring, managing and controlling risks of regulatory concern' (FSA 2010b). A key assumption for the effectiveness of the IMS is that all trades and positions are recorded within one core system in order to provide a firm-wide view of compliance. However, a senior systems' consultant advised that one financial intermediary had utilised five flavours of IMS system including two separate versions provided by this study's IMS vendor. This firm was now seeking to consolidate into one system at considerable cost. Interfacing between separate IMS is problematic. A systems manager observed, 'And the

problem is, when you've got two systems, it's similar to two people with a similar language trying to communicate each other. There's some overlap, but not enough so putting them together creates nothing but confusion and even bigger problems.' The adoption of multiple IMS is characteristic of pre-crisis logics for meeting regulatory obligations. The study revealed that prior to the crisis compliance operations were departmentally and geographically siloed, possibly as the result of compliance departments being de-empathized and side-lined.

The interview respondents suggested that manual practices and in particular the use of spread sheets for monitoring and recording concentrations and limits are becoming increasingly deplored by the regulator and firms are being strongly encouraged to replace their manual systems. However, the study found that there is some resistance to these changes. A systems consultant and trader both observed that the displacement of spread sheets was likely to be resisted by front-office individuals such as traders. He suggested that some of these individuals, 'were less IT savvy' and so were resistant to technological change and felt that the use of spread sheets was 'tried and tested' and they therefore lobbied to preserve this practice.

The study's participants felt that personal relationships between the regulator and the financial intermediary didn't contribute significantly to trust dynamics. The financial intermediaries perceived the trust relationship as remaining uninfluenced thorough frequent contact and interaction. In the view of one manager, 'such relationships don't impact the regulator's position; they are just interested in results.'

In summary, the IMS facilitates trust between financial intermediaries and regulators by providing confidence that potential errors within the compliance process are reduced through the adoption of automated systems. Thus, trust is facilitated by the adoption of a system capable of delivering reliable and consistent practices for enacting regulatory institutions. Its use sends the regulator a signal that the financial intermediary's behavioural antecedents are underpinned by robust compliance practices. Furthermore, IMS adoption demonstrates a commitment to a control culture. Through the use of a core IMS, financial intermediaries are provided with an aggregated view of their positions and exposures firm wide. Thereby, the IMS provides the regulator with some faith that the firm has consolidated view of its exposures. In this way, the IMS facilitates 'trustworthiness-demonstration' to the regulator by the firm. However, the findings suggest that there is potential for this trust to be undermined through the persistence of practices associated with pre-crisis institutional logics. For example, the continued use of multiple systems or manual processes in conjunction with the IMS may act to considerably reduce its effectiveness and correspondingly erode the regulators' trust in the organization to meet long term compliance obligations.

4.3 Trust Between Investors and the IMS

We observe another trust relationship facilitated by the IMS, which has developed as a result of the shift in institutional logics. Following the crisis and the new enhanced regulatory frameworks investors are taking an increasing interest in evaluating systems and thereby making a decision to trust or distrust vendors. However, such trust is highly impersonal as we could find no evidence of any direct interaction between the investor and the IMS vendor. A senior relationship manager for the IMS vendor suggested that the vendor's reputation is integral to demonstrating trustworthiness to investors. If the adoption of such systems is to be trusted by investors to facilitate compliance then the reputation of the system is paramount. The IMS vendor's reputation provides credibility, relevance and meaning to the financial intermediaries, message to investors that they have implemented competent, stable and consistent compliance practices. Bachmann and Inkpen (2011) suggest that institutional arrangements can act as third part guarantors to reduce the risk of the trustee behaving in an untrustworthy fashion. In this case, the widespread adoption of the IMS, highlighted by the vendor's relationship manager, suggests that this particular system's use is becoming institutionalised. Thus, the institutionalization of the IMS itself builds its reputation and acts as a guarantor to investors.

However, the research findings suggest that such trust may be misplaced where multiple IMS are adopted or being consolidated. Investors may not be aware of situations where multiple systems are being utilised. The IMS vendor's senior relationship manager commented on the firm which used five separate IMS. Where multiple systems are being replaced the benefits of doing so may not be realised for some time as the consolidation process takes time and absorbs resources. Furthermore, we envision a scenario where Financial Organization 3 would be able to demonstrate to investors they had an IMS in place without making it transparent that other IMS were also in use and were thereby hindering effectiveness. Here again, we find that pre-crisis logics of action for organizing compliance practices resulting in siloed compliance departments and the use of disparate systems may undermine post-crisis institutional logics and the correspondingly trust derived from such logics.

In summary, the facilitation of trust through 'trustworthiness-demonstration' requires the trustor to have a suitable knowledge of the context to judge if the demonstration is ceremonial or superficial or whether the practices being demonstrated are truly embedded within the organization. Asymmetric information characterises financial transactions and so forces investors to trust that financial intermediaries will behave with their best interests at heart. They may look to demonstrations of trustworthiness to provide assurance that institutional norms (derived from regulatory rules designed to ensure investor protection) are being complied with in a competent, consistent and stable manner. So, investors look for evidence of the quality of the financial intermediary's operational environment and view the adoption of systems such as the IMS as important indicators. However, an

investor's ability to judge the robustness of compliance practices may also be clouded by asymmetric information regarding the organisation's processes, systems and data. We observe that within the context of this study the process of 'trustworthiness-demonstration' may in itself require a level of inherent trust that the demonstrator will not act in a disingenuous manner. Consequently, we conclude that, in this case, the concept of 'trustworthiness-demonstration' directly between trustor and trustee is not without flaws and so may benefit from the introduction of a third party, such as an independent auditor to assess the demonstration. However, organizations may conclude that the additional costs may outweigh the need to mitigate such risks. Here again, institutional trust plays an important role as the investor and financial intermediary may look to judge the auditors' trustworthiness through behavioural antecedents such as, quality of reputation, relevant experience and professional qualifications. The auditor's track-record, experience and professional qualifications act to indicate their adherence to institutional norms of practice which underpin behaviours and so influence the trustors' decision to employ their services. Once the relationship has been established institutional norms relating to professional practice may provide templates for patterns of interaction between the auditor, financial intermediary and investors, thereby further enabling trust.

4.4 Trust Between the IMS Vendor and Financial Intermediaries

The FSA (2007b, p. 1) handbook states that financial intermediaries, 'when relying on a third party for the performance of operational functions which are critical for the performance of regulated activities… [must] on a continuous and satisfactory basis, ensure that it takes reasonable steps to avoid undue additional operational risk.' Furthermore, the regulator does not allow organizations to outsource their responsibility for meeting compliance obligations. Consequently, financial intermediaries must have considerable trust and confidence in the third party organizations they employ to assist them with compliance.

The IMS reputation, built on the large number of organizations utilizing it and its ability to managing large accounts, was found to be an important factor when building trust between investors and the IMS. The IMS reputation is also important in building trust with financial intermediaries. However, unlike the trust relationship between the investors and the IMS vendor the relationship with financial intermediaries is complimented and sustained through strong personal relationships built between the IMS relationships manager and key executives responsible for compliance within financial intermediaries. As we previously observed, institutional trust built through the system's ability to underpin behaviour antecedents and structure interactions with markets contributes to trust development and financial intermediaries' selection and continued adoption of the IS. However,

on-going trust in the system's capabilities to meet emergent operational and regulatory challenges is developed through regular personal interaction between relationship managers and executives.

The study revealed that the IMS vendor is responding to shifting institutional logics by providing additional services designed to assist with meeting new regularity requirements and enhancing the systems' capability to deliver robust compliance. Services offered include, hosting, data provision, external surveillance and monitoring of breeches and rule exceptions as well as the review and codification of new regulatory requirements into automated rules and reviews of existing rules. However, such a strategy is still in the early phases of adoption and requires significant levels of trust between the financial intermediary and systems' vendor.

In summary, long-term trust between the IMS vendor and financial intermediaries is pivotal as financial organizations may not outsource compliance responsibilities and are required by the regulator to ensure that third parties, such as the IMS vendor are competent and able to deliver strong practices. Such levels of trust are built through institutional trust in the system's reputation as well as on-going personal interaction between key executives. The IMS vendor is seeking to respond to respond to shifting institutional logics and leverage existing trust relationships to provide enhanced services.

4.5 Trust Between the IMS Vendor and Regulator

The study found scant evidence of trust relationships between the regulator and the IMS. The research participants suggest that the lack of a direct relationship between the IMS vendor and the regulator was quite deliberate on the part of the regulator. A compliance manager noted that, 'the regulator will not endorse specific systems' vendors for fear of setting a legal precedent if such systems fail.' However, the regulator's preference for financial intermediaries to move towards a core system and away from manual processes, suggests a tacit approval of IMS solutions.

5 Concluding Remarks

In terms of what conditions can new regulations create or restore trust, our findings suggest that, in the post-crisis environment, trust of financial intermediaries by investors may be built or repaired through the application and demonstration of robust practices for meeting compliance. The findings show that the application and demonstration of quality controls, through IMS adoption, facilitates new business relationships and also upholds existing clients' trust in the firm during on-going processes of due diligence. Thus, our findings validate Gillespie and Dietz (2009)

concepts of 'distrust regulation' and 'trustworthiness-demonstration' for trust repair. However, we caution practitioners that asymmetric information may inhibit reliable evaluations demonstrations of trustworthiness.

The results of the study also validate Bachmann and Inkpen's (2011) perspective that trust may be developed through reference to strong and reliable institutional arrangements, which target behavioural antecedents prior to trust development or structure key interactions, once the relationship has begun to become established. However, we find that interactions, influenced by institutions, may not necessarily take place between the trustor and trustee but that such interactions may be conducted by the trustor on behalf of the trustee. Thus, institutional arrangements provide faith such interactions will be appropriately managed. Where financial intermediaries are meeting the new post-crisis regulations in competent, stable and consistent ways and where behaviours are appropriately constrained, investors may feel reassured, correctly or incorrectly, that such organizations are committed to a control culture and are less likely to mismanage funds or be the centre of another financial scandal.

We argue that trust in the outsourcing relationships between client and supplier of IMSs is becoming increasingly complicated, in part, due to the need to build capabilities to meet new regulatory requirements, where technology is integral in this process. In the case of IMS adoption, trust primarily emanates through assurance that norms derived from regulatory institutions are being soundly applied. Thus, concepts of institutional trust are paramount. However, the findings also highlight the role of personal interaction in maintaining trust relationships between financial intermediaries and system vendors and between financial intermediaries and investors. The results suggest an absence of personal trust between the regulator and systems vendors and between the systems vendor and investors. The study revealed that trust between investors and systems vendors is therefore exclusively dependent on their reputation and corresponding ability to facilitate institutional arrangements.

A key finding is that the building of trust through institutions, in the case of post-crisis IMS usage, is inherently linked to shifts in institutional logics and competition between associated pre and post-crisis logics of action. Faith and trust in financial systems and organizations may be somewhat derived from shifts towards enhanced supervision and the corresponding design of regulatory institutions. The effective implementation and management of associated regulatory controls will play an important role in defining perceptions of the usefulness of such regulations. However, we find that persistent practices, historically embedded within the organization prior to the crisis and derived from pre-crisis institutional logics, may compete with new compliance practices. Such competition has the potential to undermine new approaches and correspondingly trust in the new institutional logics from which they are derived and the organizations which abide by them. Consequently, we caution practitioners to take steps to ensure the displacement of such practices and highlight how constraining technologies have the potential to play an integral role in their displacement. Future research may empirically investigate the extent to which pre-crises practices have actually

become displaced. In addition, the study focuses on the 'buy-side' of financial markets and so further research may also consider trust relationships between regulators, financial intermediaries, systems vendors, investors and *issuers* of securities. Furthermore some scholars have suggested that systems of monitoring, surveillance and control may actually negatively impact trust and elicit negative, behaviours .Within the context of our research this remains a distinct possibility (Kramer 1999). The interviews revealed a perception that some powerful traders and fund managers are likely to resist the move away from manual spread sheets. When faced with coercive forces, compliance is just one option available to actors (Streeck and Thelen 2005). So, future research may investigate the impact of IMS related technologies on employee trust and how powerful individuals may seek to subjugate the IMS.

In conclusion, the conditions by which new regulations may create or repair trust include an organization's ability to adopt and demonstrate robust practices for compliance, through technologies which embody regulatory rules and thereby constrain practice and influence culture. Further assurance may be found where there exists a congruence of trust between regulators, systems vendors, investors and financial intermediaries in the practices and systems being adopted. The concept of 'distrust regulation' is underpinned by technology and changes in operational logics of action derived from associated shifts in institutional logics of regulatory supervision. Displays of trustworthiness are also reliant on constraining technologies and may focus on the demonstrable displacement of logics of action for organizing compliance no longer deemed acceptable.

Focusing on how controls affect individual, organizational, institutional and societal trust, we suggest the conditions whereby regulations can build and repair damaged trust operate at various levels. Gillespie et al. (2012, p. 211) suggest a link between impersonal and personal trust and advocates further research within this area, 'Given that trust is widely accepted to be a 'meso' concept (Rousseau et al. 1998) integrating micro-level psychological processes and group dynamics with macro-level organizational and institutional forms, we see the need for examination and a more nuanced understanding of the multiple, cross-level effects that influence trust repair (e.g., at the interpersonal, group, organizational, institutional, and societal levels). At the societal level, society's appetite for risk in financial systems has diminished. Douglas (1982, p. 12) proposes that cultural categories, such as appropriate levels of economic risk taking by financial organizations, should be treated as cognitive containers where, 'social interests are defined and classified, argued, negotiated and fought out.' As a result of the crisis we have seen increased debates over appropriate levels of regulation and heightened societal expectations for governments to enhance regulatory frameworks in order to manage systemic risk and prevent further crisis. This phenomenon has precipitated shifts in institutional logics moving from free market'light touch' regulation to intense supervision. Consequently, the post-crisis regulatory environment is characterised by new regulatory obligations of considerable breadth and depth, designed to radically alter behaviours. Thus, societal trust may be

influenced by changing institutional logics, which facilitate new regulatory controls and also by the quality of the practices that implement them.

When considering the role of robust regulatory controls and practices in building trust repair, the crucial unit of analysis is the relationship between the investor and the financial intermediary. The research highlights how at the individual level personal trust based relationships between financial intermediaries' account managers and investors may plan an important role in maintaining or rebuilding trust relationships over time. However, institutional trust also plays an integral role in maintaining and rebuilding trust relationships. In this case, regulatory institutions embodied within IMS influence patterns of interaction with markets, conducted on behalf of investors. Furthermore, institutional trust plays an important role in building new trust relationships by attaching credibility and meaning to signals being sent to investors as part of the sales and marketing process.

In conclusion, regulatory controls may enable strengthening of trust at the individual, organizational, institutional and societal levels if trust is underpinned by new logics of action derived from new institutional logics which ensure that regulations are being complied with in a stable, competent and consistent manner and where personal interactions maintain and preserve inter-organizational trust.

A limitation of the study is that it focuses on just eight financial organizations who are clients of the IMS vendor. So while it is difficult to provide generalised observations or even recommendations of how financial organizations will respond to increasing regulatory controls at each unit of analysis, this study raises some interesting points about the evolving role of IT suppliers in negotiating more complex and accountable outsourcing contracts which incorporate new legislation and regulation on compliance and risk. Finally, the study makes a contribution to the body of literature on institutional trust in the context of outsourcing relationships in the financial services by providing empirical examples of how shifting institutional logics, technologies and regulatory controls all influence trust dynamics and relationships in the post-crisis environment.

References

Bachmann, R., Gillespie, N., & Kramer, R. (2012). Call for papers: Special issue of organization studies on 'Trust in crisis: Organizational and institutional trust, failures and repair'. *Organization Studies*.

Bachmann, R., & Inkpen, A. C. (2011). Understanding institutional-based trust building processes in inter-organizational relationships. *Organization Studies, 32*(2), 281–301.

BBC. (2010). Goldman Sachs agrees record $550 m fine. Retrieved December 24, 2012, from http://www.bbc.co.uk/news/business-10656699

BBC. (2012a). Global banking scandals: Who is under scrutiny? Retrieved December 16, 2012, from http://www.bbc.co.uk/news/business-19323954

BBC. (2012b). Vickers report on banks to be accepted in full—Cable. Retrieved December 23, 2012, from http://www.bbc.co.uk/news/business-16235636

Carlin, B. I., Dorobantu, F., & Viswanathan, S. (2009). Public trust, the law, and financial investment. *Journal of Financial Economics, 92*(3), 321–341.
Child, J., & Möllering, G. (2003). Contextual confidence and active trust development in the Chinese business environment. *Organization Science, 14*(1), 69–80.
Coombs, R., Knights, D., & Willmott, H. C. (1992). Culture, control and competition; towards a conceptual framework for the study of information technology in organizations. *Organization Studies, 13*(1), 051–072.
Cule, P. E., & Robey, D. (2004). A dual-motor, constructive process model of organizational transition. *Organization Studies, 25*(2), 229–260. doi:10.1177/0170840604040037.
DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: institutional isomorphism and collective rationality in organizational fields. *American Sociological Review, 48*, 13.
Doherty, N. F., & Perry, I. (2001). The cultural impact of workflow management systems in the financial services sector. *Service Industries Journal, 21*(4), 147–166.
Doherty, N. F., & Doig, G. (2003). An analysis of the anticipated cultural impacts of the implementation of data warehouses. *IEEE Transactions on Engineering Management, 50*(1), 78–88.
Douglas, M. (1982). The effects of modernization on religious change. *Daedalus, 111*(1), 1–19.
Ezzamel, M. (1994). Organizational change and accounting: understanding the budgeting system in its organizational context. *Organization Studies, 15*(2), 213–240. doi:10.1177/017084069401500203.
Flick, U. (1998). *An introduction to qualitative research*. London: Sage.
Friedland, R., & Alford, R. R. (1991). Bringing society back in symbols, practices and institutional contradictions. In W.W. Powell & P. DiMaggio (Eds.), *The new institutionalism* (pp. 232–263). Chicago: University of Chicago Press.
Franks, J., Mayer, C., & Rossi, S. (2009). Ownership: Evolution and regulation. *Review of Financial Studies, 22*(10), 4009–4056.
FSA. (2007a). *Principles-based regulation Focusing on the outcomes that matter*, April, fromhttp://www.fsa.gov.uk/pubs/other/principles.pdf
FSA. (2007b). SYSC 8.1 *General outsourcing requirements*. Retrieved December 22, 2012, from http://fsahandbook.info/FSA/html/handbook/SYSC/8/1
FSA. (2010a). *FSA's approach to intensive supervision*. Retrieved July 25, 2012, from http://www.fsa.gov.uk/library/communication/speeches/2010/0518_jp.shtml
FSA. (2010b). *SYSC 3.2 areas covered by systems and controls*. Retrieved December 27, 2010, from http://fsahandbook.info/FSA/html/handbook/SYSC/3/2
FSA. (2011). *Treating customers fairly*. Retrieved December 23, 2012, from http://www.fsa.gov.uk/pubs/other/tcf_deadline.pdf
Giddens, A. (1986). *The constitution of society*. Cambridge: Polity Press.
Gillespie, N., & Dietz, G. (2009). Trust repair after an organization-level failure. *Academy of Management Review, 34*(1), 127–145.
Gillespie, N., Hurley, R., Dietz, G., & Bachmann, R. (2012). Restoring institutional trust after the global financial crisis. In R. Kramer & L. Pittinsky (Eds.), *Restoring trust in organizations and leaders: enduring challenges and emerging answers*. New York: Oxford University Press.
Grbich, C. (2007). *Qualitative data analysis an introduction*. London: Sage.
Greenspan, A. (2008) Quoted in Chen, Z. Morrison, A. D. and Wilhelm, W. J. (2008) Fiduciary Responsibility, "Star" Cultures and Reputations, *SAID Business School Working paper series 2013–2014*
Greenwald, B. C., & Stiglitz, J. E. (1994). Asymmetric information and the new theory of the firm: Financial constraints and risk behavior: National Bureau of Economic Research.
Kraatz, M. S., & Love, E. G. (2006). Studying the dynamics of reputation: A framework for research on the reputational consequences of corporate actions. *Research Methodology in Strategy and Management, 3*, 343–383.
Kramer, R. (2012). Institutional trust failures. In R. Kramer & L. Pittinsky (Eds.), *Restoring trust in organizations and leaders: Enduring challenges and emerging answers*. New York: Oxford University Press.

Kramer, R. M. (1999). Trust and distrust in organizations: Emerging perspectives, enduring questions. *Annual Review of Psychology, 50*(1), 569–598.
Labatut, J., Aggeri, F., & Girard, N. (2012). Discipline and change: How technologies and organizational routines interact in new practice creation. *Organization Studies, 33*(1), 39–69. doi:10.1177/0170840611430589.
Leidner, D. E., & Kayworth, T. (2006). Review: A review of culture in information systems research: Toward a theory of information technology culture conflict. *MIS Quarterly, 30*(2), 357–399.
Luhmann, N. (1979). *Trust and power*. New York: John Wiley.
McDonald, L. G., & Robinson, P. (2009). *A colossal failure of common sense: The inside story of the collapse of Lehmann brothers*. New York: Crown Books.
Meyer, J. W., & Rowan, B. (1977). Institutionalized organizations: formal structure as myth and ceremony. *The American Journal of Sociology, 83*(2), 340–363.
Miles, M. B., & Huberman, M. (1994). *Qualitative data analysis: an expanded sourcebook* (2nd ed.). Thousand Oaks CA: Sage.
Morrison, A., Wilhelm, W., & Younger, R. (2012). Reputation in financial markets. In A. Gower (Ed.), *Investing in change: The reform of Europe's financial markets*. London: The Association for Financial Markets in Europe (AFME).
Munir, K. A. (2011). Financial crisis 2008–2009: What does the silence of institutional theorists tell us? *Journal of Management Inquiry, 20*(2), 114–117.
North, D. C. (1990). *Institutions, institutional change and economic performance*. Cambridge: Cambridge University Press.
Ocasio, W. (1998). Towards an attention-based view of the firm. *Strategic Management Journal, 18*(S1), 187–206.
Orlikowski, W. J. (1996). Improvising organizational transformation over time: A situated change perspective. *Information Systems Research, 7*(1), 63–92.
Patton, M. (1990). *Qualitative evaluation and research methods*. Beverley Hills, CA: Sage.
Punch, K. F. (2005). *Introduction to social research: qualitative and quantitative approaches* (2nd ed.). London: Sage.
Rousseau, D. M., Sitkin, S. B., Burt, R. S., & Camerer, C. (1998). Not so different after all: A cross-discipline view of trust. *Academy of Management Review, 23*(3), 393–404.
Saldana, J. (2009). *The coding manual for qualitative researchers*. Thousand Oaks: Sage.
Scott, W. R. (2008). *Institutions and organizations: ideas and interests* (3rd ed.). Los Angeles: Sage Publications.
Seale, C. (1999). Quality in qualitative research. *Qualitative Inquiry, 5*(4), 465.
Silverman, D. (2001). *Interpreting qualitative data: Methods for analyzing talk, text and interaction* (2nd ed.). London: Sage Publications.
Streeck, W., & Thelen, K. (Eds.), (2005). Institutional change in advanced political economies. *Beyond continuity: Institutional change in advanced political economies* (pp. 1–39). Oxford: Oxford University Press
The Economist. (2010). A *decent start. the economist July 1, 2010.* Retrieved February 23, 2010, from http://www.economist.com/node/16481494
The Economist. (2012). *Banksters*. Retrieved December 22, 2012, from http://www.economist.com/node/21558260
Thornton, P. H., & Ocasio, W. (1999). Institutional logics and the historical contingency of power in organizations: Executive succession in the higher education publishing industry, 1958–1990. *American Journal of Sociology, 105*(3), 801–843.
Thornton, P. H., & Ocasio, W. (2008). Institutional logics. In R. Greenwood, C. Oliver, K. Sahlin, & R. Suddaby (Eds.), *The sage handbook of organizational institutionalism*. London: Sage.
Thornton, P. H., Ocasio, W., & Lounsbury, M. (2012). *The institutional logics perspective: a new approach to culture structure and process*. Oxford: Oxford University Press.
Turner, A. (2009a). *The financial crisis and the future of financial regulation*. Retrieved November 23, 2012, from http://www.fsa.gov.uk/library/communication/speeches/2009/0121_at.shtml

Turner, A. (2009b). *The turner review a regulatory response to the global banking crisis*, from http://www.fsa.gov.uk/pubs/other/turner_review.pdf

Turner, A. (2012). *Banking at the cross-roads: Where do we go from here*? Retrieved December 22, 2012, from http://www.fsa.gov.uk/library/communication/speeches/2012/0724-at.shtml

Volkoff, O., Strong, D. M., & Elmes, M. B. (2007). Technological embeddedness and organizational change. *Organization Science, 18*(5), 832–848.

Weick, K. E. (1990). *Technology as equivoque: Sensemaking in new technologies*. Newbury Park: Sage Publications,

Zilber, T. B. (2008). The work of meanings in institutional processes. In R. Greenwood, C. Oliver, K. Sahlin, & R. Suddaby (Eds.), *The sage handbook of organizational institutionalism* (p. 151). London: Sage.

Zucker, L. G. (1986). Production of trust: Institutional sources of economic structure, 1840–1920. *Research in organizational Behavior, 8*, 53–111.

Software Outsourcing Decision Aid (SODA): A Requirements Based Decision Support Method and Tool

Tommi Kramer, Armin Heinzl and Michael Eschweiler

Abstract This paper seeks to address the decision making problem in IS development outsourcing scenarios in which a project manager is in charge of deciding about which software components shall be outsourced and which ones shall be developed internally. Therefore, we propose a method and tool which leverage the classification of a project's software components by means of a graph-based model of the components' requirements and their corresponding clustering. In the course of our design oriented approach, a prototypical implementation of the method has been conducted and evaluated. It illustrates the practical utility of the proposed method. We thereby contribute to the decision making problem in distributed software projects and provide guidance for in-house or external software production. The contribution consists of revealing an improved processing method for assessing software requirements and increasing the outsourcing success of a software project. Our contribution for practice is an implemented prototype for project leaders of distributed teams. In this research, we have emphasized deriving design requirements from underlying theories as well as the evaluation of the outcomes.

Keywords Outsourcing · Information systems development · Decision making · Decision support · Requirements engineering · Graph-based model · Small and medium sized enterprises

T. Kramer (✉) · A. Heinzl
University of Mannheim, Business School, Mannheim, Germany
e-mail: kramer@uni-mannheim.de

A. Heinzl
e-mail: heinzl@uni-mannheim.de

M. Eschweiler
Senacor Technologies AG, Schwaig, Germany
e-mail: michael.eschweiler@senacor.com

R. Hirschheim et al. (eds.), *Information Systems Outsourcing*, Progress in IS,
DOI 10.1007/978-3-662-43820-6_6

1 Introduction

Information systems (IS) outsourcing has received extensive academic attention over the last 20 years with research providing insights into why firms outsource, what they outsource, which decision process they apply, how they implement their decision, and how the outcomes are handled (Dibbern et al. 2004). A large stake of outsourcing in practice originates from Information Systems development (ISD). Outsourcing non-critical development activities can be considered as selective sourcing of application systems. Some software components are developed by internally located software teams and others are delivered by third parties from near-shore or far-shore development centers.

However, the information technology (IT) artifact as research object has experienced little academic attention in the context of outsourcing decisions. Most research into outsourcing decision takes an organizational perspective, driven by major reference theories, such as transaction cost economics (TCE) or the resource-based view (RBV) (Dibbern et al. 2004). While the identified outsourcing determinants are certainly valid in a software outsourcing context, they are insufficient to capture the whole story since the software outsourcing question is a multi-dimensional decision problem (Dibbern et al. 2004). A decision model for software outsourcing must additionally incorporate decision rationales derived from basic software engineering (SE) principles (Kramer et al. 2011).

Therefore, we have set our focus on small and medium-sized enterprises (SMEs) in which internal resource deficits (skill-wise, personnel-wise, or performance-wise) outweigh other factors as some sort of overriding contingency when taking a decision whether to outsource or not (Dibbern et al. 2003). This is substantiated by a more recent study among German SMEs (Klimpke et al. 2011). This study reveals that SMEs mainly outsource software development striving for increased flexibility and better skill access rather than mere cost savings.

Mitigating these risks requires a structured approach in the shape of a risk management process (Yalaho 2006), for example, or simply guiding principles for a sourcing decision that enable systemic thinking (Dedrick et al. 2011). This is particularly challenging for smaller firms which are characterized by less formal structures (Carmel and Nicholson 2005). Their decisions often evolve in some sort of collaborative ad hoc manner. Moreover, their skills are likely to be insufficient for establishing outsourcing relationships. Also, depending on the degree and the outsourcing object, SMEs might need external support that can contribute the required outsourcing expertise (Al-Qirim 2003). However, a learning curve effect can presumably be expected, provided that SMEs frequently engage in outsourcing.

In order to address the challenges in research and practice, we have developed a decision support method and a tool that provide a complementary view on the outsourcing decision through the introduction of an IS development perspective. Our research objects are software requirements. Our method supports the process of structuring requirements into modular clusters and decides which of these

clusters qualify for being outsourced. It builds upon a graph representation of requirements and applies spectral clustering along with graph algorithms known from social network analysis (SNA). The method is meant to offer SMEs an outsourcing decision support by structuring the decision problem and allowing decision makers structural analyses to classify work packages for insourcing and outsourcing. The applicability of the method and, hence, of the tool shall correspond to the following requirements:

(1) Good clustering quality: The clusters generated by our method have to be feasible from an ISD perspective (cf. clustering and cohesion).
(2) Good scalability/low setup costs: The developed method must scale in a larger setting with several dozens or even hundreds of requirements.
(3) Perceived enhancement: The developed method must generate perceived utility for a decision maker in terms of enhancing his or her decision making process. This is achieved by (1) and (2) as well as further design elements (e.g. tool usability).

Following Kramer and Eschweiler (2013), our work adopts a design science approach (Peffers et al. 2007; Kramer and Eschweiler 2013). In the subsequent section, we step into relevant theories, concepts and existing approaches our method draws from. Afterwards, in Sect. 3 we describe our decision support method and its prototypical instantiation. By means of the prototype, the decision support method is evaluated in Sect. 4 before we conclude with an overall summary in the last section.

2 Foundations and Related Work

Our method draws from mainly three research streams that comprise IS outsourcing, requirements engineering, and graph theory. We elaborate on the different streams in the following subsections and highlight the relevant aspects that have impact on our proposed research.

2.1 Underlying Theories in IS Outsourcing Decision Making

The software component outsourcing question is a multi-dimensional decision problem (Dibbern et al. 2004; Kramer et al. 2011). We will draw on TCE, the RBV as well as systems theory as basic frameworks for this decision problem (Dibbern and Heinzl 2001; Langlois 1995; Picot and Baumann 2007). Systems theory will help us to define modular clusters of requirements as outsourcing candidates that may be analyzed and prioritized according to their asset specificity (TCE) or pertaining resource gaps (RBV).

By adapting *TCE*, we assume that human assets play a major role in outsourcing contexts. Since the competitive ability of software companies can primarily be based on the human capital of their employees, their outsourcing intention is always subject to considerations of the amount of transaction costs of specific components (Dibbern et al. 2004; Williamson 1990). Systems requirements that mirror highly specific processes, functions or technologies evoke significantly higher transaction costs than non-specific objects (Dibbern et al. 2008). Consequently, the costs for managing the complexity of processes, functions and technologies can overrun cost savings expected from outsourcing (Dibbern et al. 2008).

The *RBV* argues, if there are no sufficient resources available internally, a company should outsource the adhering tasks (Grant 1991; Teng et al. 1995; Langlois 1995). Stratman (2008) proposes to categorize well understood, standardized service processes without strategic impact, as non-core and, thus, they consider them potentially suitable for outsourcing. In contrast, tasks that are complex and non-standardized are considered to be core functions, since they include specific and tacit knowledge and involve complex decision making. Consequently, these tasks show more challenging and complex characteristics, which may endanger a project's success in case of outsourcing (Dibbern et al. 2008).

A central aspect of ISD outsourcing and mainly relevant for the technical aspect of the decision problem is the decomposition of complex systems into components or modules. Theoretically, the property of decomposability derives from work by Simon (1962) who contributed to a general systems theory. In his work, he attempted to give a description of generic properties any observable complex system exhibits. A complex system is defined as "[…] one made up of a large number of parts that interact in a non-simple way" (Simon 1962, p. 468). An essential facet of his work is the property of near decomposability. It refers to the ability to decompose a complex system into subsystems with the interactions between these subsystems being "[…] weak, but not negligible" (Simon 1962, p. 474). In other words, subsystems or components, respectively, have intra-component linkages which are generally stronger than inter-component linkages but the components are not perfectly independent. In ISD terms, these inter- and intra-component linkages determine coupling and cohesion of software components. Following Larman (2002, p. 232), cohesion "is a measure of how strongly related and focused the responsibilities of an element are". Coupling, on the other hand, describes "a measure of how strongly an element is connected to, has knowledge of, or relies on other elements" (Larman 2002, p. 229). Applying the property of near decomposability leads to the conclusion that coupling cannot be eliminated.

However, academics and practitioners have often neglected the property of near decomposability and argued for system modularization that subsequently allows for perfectly independent and concurrent development of individual subsystems. Admittedly, this describes a desirable but somewhat unrealistic state (Picot and Baumann 2007). In addition, the concept of bounded rationality (Simon 1955)

prohibits engineers from designing an optimal solution when modularizing a complex system. Although the modularization helps managing the complexity by hiding it through means of abstraction behind an interface (Baldwin and Clark 2000), it is unlikely to be optimal. Instead, software engineers seek for a satisficing solution which describes an adequate or reasonable solution to a problem (Picot and Baumann 2007).

The way a complex system is decomposed into individual modules has consequences for software outsourcing. From a control theory perspective, two modes of formal control are relevant in outsourcing relationships from the client's viewpoint: behavior control and outcome control (Kirsch et al. 2002). Tiwana (2008) found that modularity and control are imperfect substitutes in that modularity lowers the need for process control but not for outcome control. In that sense, modularity itself is some sort of governance mode as higher modularity by tendency reduces the need for control and coordination in an outsourcing relationship which, according to TCE, are both drivers of transaction costs.

Dedrick et al. (2011) reported on the importance of modularity for distributed knowledge work which can be considered an abstraction of software outsourcing. In this context, modular activities are defined as those that can be performed independently of one another and then later integrated (Schilling and Steensma 2001). From their literature review, they argued for an immediate and negatively correlated relationship between modularity and communication effort. That is, high modularity reduces communication effort as opposed to low modularity which increases communication effort as knowledge activities are barely separated. From TCE perspective, modularity is thus negatively correlated with transaction costs leaving other factors out of consideration.

System decomposition is equivalent to the separation of knowledge activities. It is about separation of concerns which describes the "[…] ability of identifying, encapsulating and manipulating of parts of software that are crucial to a particular purpose" (Moreira et al. 2002, p. 167). It is a means for reducing complexity and understandability of software throughout its life cycle. In this context, Tarr et al. (1999) introduced the notion of the tyranny of the dominant decomposition. It refers to decomposing a system based on a single dominant criterion like data, for example. Cross-cutting concerns which do not align with that decomposition perspective are likely to get scattered across modules thereby compromising their degree of decoupling. Moreira and Araújo (2011) found that most ISD approaches use dominant criteria for modularizing systems and face problems like requirements or code scattering which illustrates the difficulty of a "good" decomposition. It requires a strategy that allows to view a system and possible forms of decomposition from different perspectives to find a satisficing one.

The decision support method presented in this research work aims to structure a set of requirements into loosely coupled subsets. From the previous findings, it can be concluded that it is not possible to generate perfectly independent clusters. If this would be the case, then presumably because certain existent interdependencies had not been identified as a consequence of bounded rationality (Picot and Baumann 2007). Consequently, it is important to identify and represent the "most

important" interdependencies that influence the coordination effort the most significantly. Thus, we complement the economic rationale for decision making by systems theory and develop a method to identify which interdependencies between requirements exist and which ones are most important.

To sum up, the focus of this paper is how such a requirements model (RM) can be created, clustered and structured. The outcome of this process helps to determine which software modules could be developed in-house or externally.

2.2 Requirements Engineering

2.2.1 Classification of Requirements

The prevailing distinction of requirements differentiates functional and non-functional requirements (NFRs). Functional requirements comprise statements on services the system must be capable to perform. Apart from the services a system offers, functional requirements define reactions to specific events or system behavior in certain situations. NFRs, on the other hand, describe constraints that include time constraints, process constraints, or standards, for example. They usually relate to the system as a whole rather than individual functional requirements or services. Put differently, a functional requirement describes ''what'' the software does in contrast to a NFR that describes ''how good'' a software does something. Requirements which do not immediately pertain to the system are irrelevant for our method as its inherent model aims to semantically capture the software product, not its context.

2.2.2 Requirements Interdependencies

By focusing on requirements, we argue that it is crucial for software clustering and architectural design to understand a system from a semantic perspective, independent of syntactic dependencies. Hence, our method attempts to capture relevant types of semantic interdependencies that exist between requirements.

In general, such interdependencies can be classified into vertical and horizontal ones. Vertical dependencies stem from transitions between RE phases that require a change of the level of abstraction. These vertical relations are mostly hierarchical in that lower level requirements refine what a higher level requirement specifies. Since they would simply shift the lens of observation to a lower level they are not of interest for the method we present in this paper. Instead, the focus is on horizontal dependencies that constitute system cohesion and impact on how requirements are semantically related and how they can be structured, correspondingly.

We refer to a model of seven fundamental interdependency types (Dahlstedt and Persson 2005) that synthesizes different views from the literature. In that definition, *similar_to* refers to a semantic match of varying degree and is

significant for structuring requirements as it is an expression of cohesion between two requirements. *Requires* describes the condition that ''[the] fulfillment of one requirement depends on the fulfillment of another requirement'' (Dahlstedt and Persson 2005, p. 103). Beside conditional and functional dependencies, *requires* also describes temporal dependencies in the form that a requirement needs to be implemented before another one can be implemented. In summary, *requires* is highly relevant as it alters the semantics of interlinked requirements and thus impacts on their cohesion with varying intensity. Our method focuses on the relations *requires* and *similar_to* which are considered the main drivers of semantic cohesion.

2.3 Graph Theory

2.3.1 Graph Representation

Graph theory essentially relies on the existence of pairwise relations between objects (Gross and Yellen 2004). Requirements and their interdependencies exactly represent such objects with pairwise relations in between. Hence, graph theory is ideally suited for the formal representation of requirements and their relations. The formal graph representation provides the necessary degree of structure for the computable part of the decision problem, the clustering of requirements and corresponding metrics. Hence, we represent requirements by the use of typed and weighted graphs where types describe different sorts of interdependencies and weights express varying degrees of cohesion. To work with these graphs pragmatically, we use a weighted adjacency matrix.

2.3.2 Graph Partitioning

Clustering vertices into disjoint subsets is known as graph partitioning in graph theory (Borowiecki 2011; Gross and Yellen 2004). The properties quality and time of graph partitioning heuristics were found to stand in a conflicting relationship. By tendency, algorithms that take longer produce better results than more time-efficient algorithms. Whereas this is a trade-off in time-critical settings, such as parallel computing, time is not that much of an issue in the context of our decision problem. As a logical consequence, high partitioning quality is the primary intent. Partitioning quality, in turn, can be defined in various ways. For graph partitioning in general, it is usually determined by the cut size. Given two disjoint partitions V1 and V2, the cut describes all edges that have one end in V1 and the other in V2. Its size is the sum of edges or, given they are weighted, the sum of their weights. Typically, partitioning algorithms try to minimize the cut size.

Graph-partitioning algorithms can be classified into geometric and coordinate-free algorithms (Fjällström 1998). In the context of graphs, geometric algorithms

require a graph to be embedded into the metric space which is not given in the present case. Requirements do not possess any coordinates. This fact rules out geometric algorithms leaving non-geometric heuristics. These coordinate-free methods focus on the combinatorial structure of the graph (Fjällström 1998) which, from the perspective of this paper, replicates the semantic cohesion of requirements. We focus on the set of algorithms from the field of recursive spectral bisection (RSB). By tendency, RSB algorithms outperform traditional approaches, are easy to implement, and efficient to solve through standard linear algebra operations (Luxburg 2007). They leverage the algebraic properties of a graph's matrix representation, particularly that of its Laplacian matrix.

2.3.3 Structural Analysis of Graphs

A structural analysis of graphs uses metrics to derive conclusions about the characteristics of the whole graph, subgraphs, or individual vertices. Whereas algorithms process the graph structure in order to solve a certain problem, structural analysis generates quantitative measures in order to describe it and the construct it has been derived from. This is particularly useful for the given problem as it allows to objectively identify important and less important requirements on the basis of their relations and weights. To do so, we make use of the centrality concept that originally stems from the analysis of communication networks and tries to identify nodes that are important to the communication within the network.

2.4 Related Work

Within the area of IS, the question of which components qualify for outsourcing and which ones do not, remains still unanswered. Comprehensive research on that particular level is scarce. Hence, our review of related work follows a three-step approach: graph-based representation of requirements, clustering of requirements and structural analysis of requirements.

2.4.1 Graph-Based Representation of Requirements

Approaches towards the graph-based representation of requirements mainly include graph-based traceability and the representation of NFRs. The latter mostly deals with decision making. The field of graph-based traceability attempts to leverage the benefits of a graph-based visualization for improving the ability to explore and analyze requirements and their interrelationships, e.g., a graph-based model that uses labeled edges to represent requirements. The model contains a weight measure for edges that express the semantic match between different requirements (Heim et al. 2008; Hildenbrand 2008). The approach by Yaung

(1992) could be identified as using a graph-based model for the purpose of requirements clustering. His approach also focuses on functional requirements without distinguishing between relationship types. A relation in his model expresses a certain degree of cohesion. The degree is included as an edge weight.

2.4.2 Requirements Clustering

The majority of requirements clustering approaches use clustering for the purpose of system modularization which is commonly viewed as decomposition into strongly cohesive and loosely coupled groups of requirements. However, the individual approaches to arrive at this state differ substantially. Li et al. (2009) aimed at requirements encapsulation which, in essence, is the modularization of requirements and the definition of interfaces for these modules. They defined a set of seven requirements attributes that pertain to semantics and structure. They did not use explicit relations between requirements.

Requirements are clustered based on the overall similarity of their attributes, hence multi-dimensional similarity. Their approach requires a detailed requirements specification and extensive manual work in order to define the set of requirements and their attributes. The approach of Yaung (1992) is presumably closest to our objective of clustering a graph structure into cohesive groups of nodes. His approach is, however, simpler in that he does not distinguish between different types of relations. Furthermore, the algorithm he proposed requires the specification of a cohesion threshold by an expert. If the cohesion of two requirements is above that threshold, they are assigned into the same cluster. Hence, the result of the algorithm is highly dependent on how that parameter has been defined. Nonetheless, it is an early example of the applicability of a graph-based approach.

The following three approaches all originate from the same author. In all three, Al-Otaiby attempted to cluster a requirements similarity matrix for the purpose of software modularization (Al-Otaiby and AlSharif 2007; Al-Otaiby et al. 2005; Al-Otaiby et al. 2004). Each approach uses a different algorithm to do so. Al-Otaiby et al. (2004) applied a combination of heuristics to optimize modularization quality. Al-Otaiby et al. (2005) apply a data mining technique that relies on a similarity measure. In particular, they used agglomerative clustering which is an iterative bottom-up clustering technique that starts off with n clusters, with n being equal to the number of requirements, and reduces the number of clusters by one with each step. The optimal number of clusters is determined by a threshold value which they label cut point. However, they did not further define that measure. A relevant finding is that the result of the clustering is highly dependent on how the similarity measure is applied. In agglomerative clustering, there are typically three common similarity measures: single-link, complete-link, and average-link similarity (e.g. Manning et al. 2008). In their experimental case, single-link yields two clusters, complete-link gives five clusters, and average-link results in two clusters that are different from those of single-link. Al-Otaiby et al. (2005) concluded that

complete-link is the best strategy as it tries to generate clusters that are as dissimilar as possible. Lastly, Al-Otaiby and AlSharif (2007) tried a popular clustering technique called k-means (e.g. Manning et al. 2008). However, it requires to specify the number of clusters in advance and is a geometric approach. They did not compare the quality of the results to those from their previous papers, so they cannot be ranked.

Another approach is offered by Yong et al. (2008) who applies RSB for system decomposition. However, their method does not operate on requirements but takes an object dependency graph which is then recursively bisected until one of the resulting two subgraphs is less cohesive than the original graph. It is worth being mentioned as it reportedly produces results of superior quality. Yong et al. (2008) have compared the generated partition with one that had been manually devised by a system expert. They found their algorithm to generate results that were consistent with those from the manual decomposition. However, it is debatable whether this quality level is a result of the algorithm or the structure of their object dependency graph that left no options for other sensible partitions. Nevertheless, it is difficult to draw a conclusion on how the algorithms competitively perform.

2.4.3 Structural Analysis of Requirements

Structural metrics in the context of graphs provide insights into the characteristics of a graph (global measures) or certain vertices (point/local measures). Of interest are centrality measures that reflect the importance of a vertex in a network. The analysis of such networks has become popular in social sciences as SNA. Within graph-based traceability, SNA has been applied but with emphasis on important persons within the traceability network (Hildenbrand 2008).

A context where SNA is applied relates to requirements-driven collaboration (Damian et al. 2010). In this context, focus is placed on requirements and relationships to team members that work on certain requirements. SNA is utilized to study aspects such as communication. Within graph-based traceability, SNA has been employed but focuses on important persons within the traceability network (e.g. de Souza et al. 2007).

Moreover, one approach could be identified that applies SNA techniques to assess the importance of individual requirements. Fitsilis et al. (2010) attempt to conduct a prioritization through structural metrics. In order to do so, they created a requirements interdependency matrix which was then used to determine the individual centrality measures. They demonstrated the results for betweenness centrality, closeness centrality, and different types of degree centrality (in, out, total). Results indicated that different centrality metrics yield different values, i.e. rankings varied to a certain degree depending on the centrality measure chosen. While their example illustrates the applicability of this approach, it also demonstrates that this field is understudied. It requires standard measures along with reference values to describe the characteristics of requirements throughout the SE process (Fitsilis et al. 2010).

3 SODA: An Outsourcing Decision Support Method

3.1 Method Overview

Figure 1 sketches the conceptual steps that constitute the Software Outsourcing Decision Aid (SODA) method. The first step relates to the creation of the RM. Software requirements are transformed into a graph-based model which is based on specific syntactic rules. The graph-based model is then forwarded to the second step that attempts to identify cohesive groups of requirements through the application of a clustering algorithm. The third step takes the clusters that have been found and conducts a structural analysis in order to determine each cluster's outsourcing suitability.

3.2 Representing Requirements

The RM is meant to reflect the combinatorial structure of a software project's requirements. Only horizontal relations are included. Dahlstedt's and Persson's model of fundamental interdependency types (Dahlstedt and Persson 2005) has been narrowed down to the interdependency types *requires* and *similar_to*. Our graph-based RM is defined as

$$G_{RM} = (V, E, w_E, t_E, W, T)$$

where V represents the set of requirements, E represents the multiset of directed edges that refer to the interdependencies between the requirements in V. w_E is a weight function that assigns a weight to each edge in E reflecting an interdependency's strength. We suggest three degrees of dependency strengths $W = \{1; 3; 5\}$. How these three degrees are transformed into quantitative values ultimately depends on the specific implementation of SODA. The only restriction imposed in the context postulates that W may not contain negative elements. G_{RM} is a labeled graph. Hence, t_E is a map that assigns a type, i.e. label, to each edge in E from the set of types T. T is defined as $T = \{similar\_to, requires\}$. It can be easily extended by simply adding additional interdependency types to T. Through this strategy, new perspectives can be included into the model. This allows clustering the model based on selected interdependency types to investigate differences between decompositions under selected decomposition criteria. Put differently, the model can be considered as a layered model with each layer being spanned by a specific interdependency type. The general model aggregates all types in a single graph. A typed model thus represents an excerpt of the general model. The model does not allow loops. For the given set of interdependency types, loops generate no informative value. Figure 2 gives an impression of how the RM is presented in our prototype. The size of each requirement is derived from its centrality.

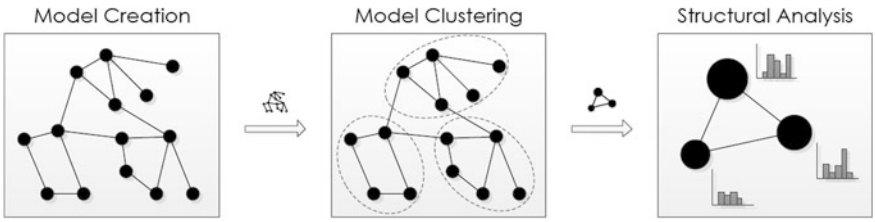


Fig. 1 Overview of the SODA method

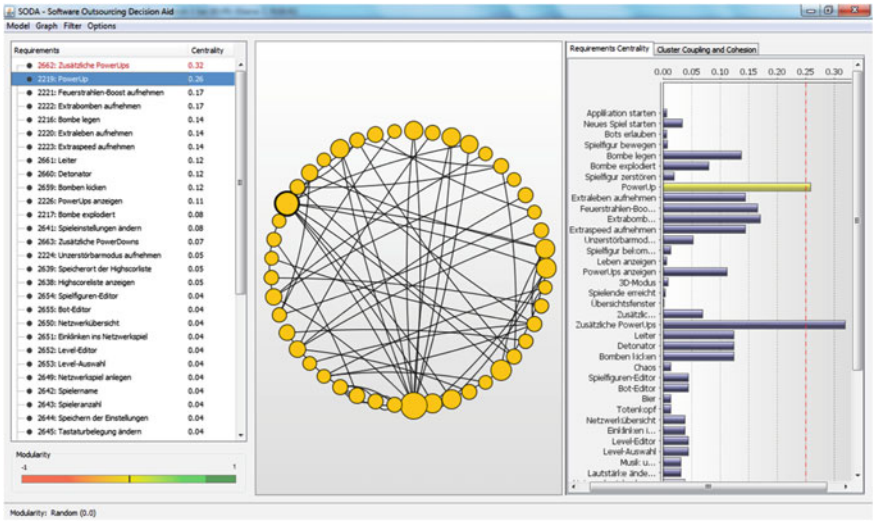


Fig. 2 SODA prototype before requirements clustering (graphical enumeration set of requirements)

An important aspect that shall be briefly mentioned pertains to the population (graphically enumerated set) of our RM. From a time wise cost perspective, SODA's main cost driver is the identification of interdependencies between requirements. Unless (semi-)automatic approaches are at hand to support the identification activity, pairwise comparisons must be conducted at the cost of $(n * (n - 1))/2$ where n is the number of requirements.

3.3 Structuring Requirements

The objective of the clustering step is to find cohesive, i.e. bonding groups of requirements. In the case of software component outsourcing, neither the number of clusters nor a cluster's size is known a priori. A major aspect is that semantically

cohesive groups of requirements are not necessarily equally sized. Moreover, the number of clusters is to be unconstrained. Setting it would improperly bias the algorithm and prevent it from finding a partition that is optimal from SODA's objective viewpoint. Hence, in the present case, the algorithm needs to be non-parameterized and free of externally imposed constraints. Its sole input represents the structure that is to be divided.

We selected an algorithm developed by Newman (2006). It is particularly applicable for the research problem as it is non-parameterized and attempts to maximize the modularity of a given network. The objective of Newman's algorithm (Newman 2006) can be referred to as community structure detection. A community structure denotes the appearance of "[…] densely connected groups of vertices, with only sparser connections between groups" (Newman 2006, p. 8577). An algorithm that detects community structures respects that the number and size of communities are determined by the network rather than a supervisor. It also admits the fact that there might not be any suitable division of the network. This criterion is decisive for SODA and could not be identified in any of the other spectral algorithms as they usually force partitions into a prescribed size tolerance. Newman (2006), however, loosened this constraint through a redefinition of the Laplacian matrix. Another advantage is that his algorithm automatically determines the number of clusters through the inclusion of a control measure: modularity. Newman's approach (Newman 2006) is thus tailored to the objective of identifying modular communities which are unbalanced in terms of size. We combine his global partitioning algorithm with a variant of the Kernighan-Lin algorithm he proposes as well. It conducts a local optimization of the modularity measure through movements of individual vertices between pairs of clusters. Figure 3 shows our prototype after clustering the set of requirements.

3.4 Structural Analysis of Requirements

The objective of SODA's third step is to take the requirements structure that has been algorithmically determined in step two and analyze it from a global (whole graph), regional (cluster), and local perspective (vertex) in order to guide a human decision maker in his or her outsourcing decision. The structural analysis results and options are shown in Fig. 4.

3.4.1 Modularity as a Global Metric

A global metric can be derived from Newman's clustering algorithm (Newman 2006) in order to characterize the modularity Q_P of a given network partition P. This allows putting it into relation to other partitions of the same network or reference values that might stem from other projects, for example. Modularity is quantitatively assessed through a pairwise comparison of nodes. If two nodes fall

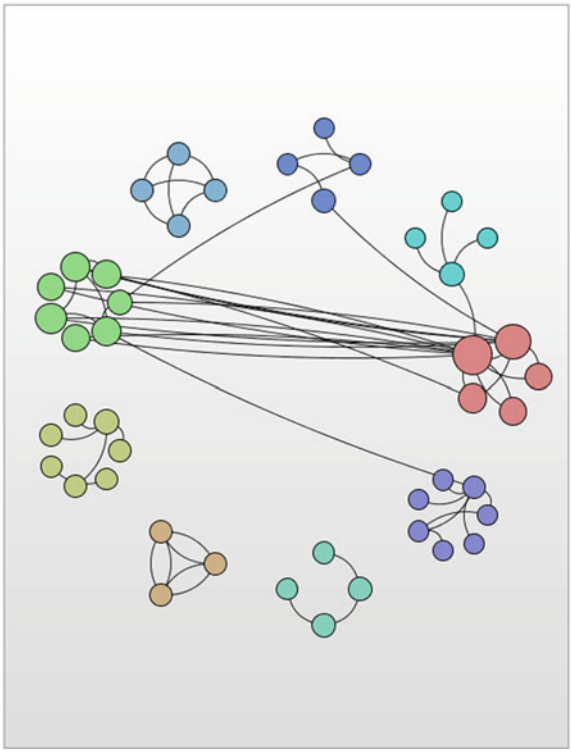


Fig. 3 SODA prototype after requirements clustering

within the same group, their contribution to modularity is the weight of the edges between them minus the expected weight in an equivalent network with randomly placed edges (Newman 2006).

Through this approach, global modularity is dependent on the partition of the network. If a user decides to manually change the partition that has been proposed by the algorithm, he or she can observe the corresponding impact on modularity. Altering the partition proposed by the algorithm cannot improve modularity as measured since the algorithm determines the partition that maximizes Q. Hence, Q_{max} shall denote the achievable modularity for a specific RM. It is computed using the partition generated by SODA's clustering algorithm. Any manual movement of nodes impairs Q_P. Nonetheless, there might be valid reasons to alter a generated partition as an individual might base his or her decision on additional information which is not included in the model.

The value range of Q_P stretches from -1 to $+1$. Q_P ranging around zero indicates a random distribution of edges with no identifiable community structure. For networks that exhibit a perceivable community structure, Q_P typically ranges between 0.3 and 0.7. Networks with negative Q_P have weakly cohesive groups that have fewer intra-linkages than one would expect in a random graph. As indicated, Q_{max} sets an upper bound on the scale from -1 to $+1$ for a given RM. It is a first

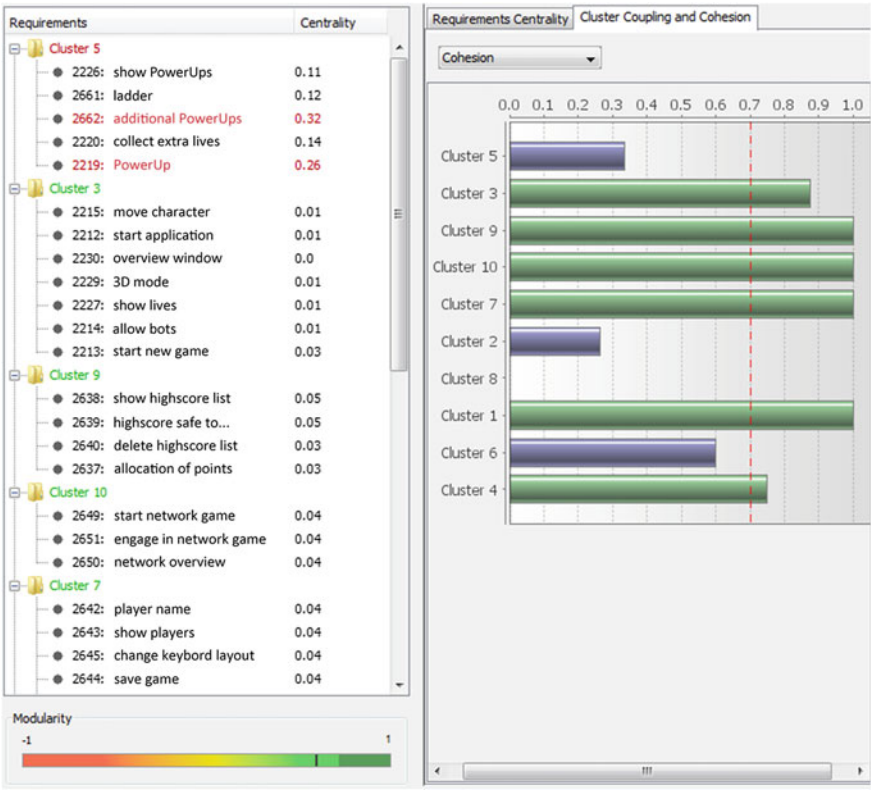


Fig. 4 SODA prototype for structural analysis of requirements clusters

indicator of how interdependent a project's requirements are from a global viewpoint. Regional and point metrics then allow creating a more differentiated picture of the situation.

3.4.2 Cluster Coupling and Cohesion as Regional Metrics

Cluster coupling and cohesion represent regional or group metrics. The former is an indicator of how strongly related the responsibilities of a subset of requirements are. The latter expresses how strongly a subset is connected to or requires external requirements. Whereas Q_{max} characterizes the entire model, coupling and cohesion describe groups of requirements, specifically the clusters that have been generated in SODA's partitioning algorithm. Coupling and cohesion hence provide a deeper insight into the outsourcing suitability of each cluster. Briand et al. (1996) formulated properties for functions that measure coupling and cohesion to which our proposed metrics adhere.

For the expression of a cluster's degree of coupling, we propose a simple count-based measure that cumulates the weight of all inter-linkages of that cluster to other clusters. It is deliberately not a normalized measure and, thus, has a value range from 0 to positive infinity. The underlying notion is that coupling is independent of both the size of the cluster and the project and only determined by the weight of linkages to other clusters.

Unlike coupling, cohesion is not an additive metric. Instead, Briand et al. (1996) stress that cohesion is a normalized metric that is forced into a specific interval. Hence, we propose a function that puts the weight of all intra-linkages into relation to the weight of all intra- and inter-linkages of a specific cluster. The value range is constrained to the interval from 0 to 1. Cohesion of below 0.5 indicates that a cluster of requirements has more external than internal interdependencies. Hence, it is desirable to have a cohesion that lies significantly over 0.5 and approaches 1. It is unlikely to achieve maximum cohesion for all clusters due to the near decomposability property of complex systems (Simon 1962).

3.4.3 Requirements Centrality as a Local Metric

For SODA, the importance of a requirement is essentially dependent on its position in the combinatorial structure of the model. This position can be characterized by the weight of its interdependencies to other requirements as well as the importance of these neighboring requirements. In that sense, importance is reciprocal. Centrality is thus driven by differences in degree. The group of centrality measures that reflects these aspects is feedback centrality. We have adopted the eigenvector centrality in which larger components of a graph are by tendency weighted more strongly than smaller ones. As previously stressed, there is a lack of reference values regarding the application of network analysis measures for requirements analysis. Hence, SODA does not define a threshold that allows a clear statement whether a specific requirement might critical, i.e. too important to be outsourced.

3.4.4 Rule-Based Recommendations

SODA does not aim at deciding which requirements can be outsourced and which cannot. Its role is meant to be supportive in the sense that decision makers get an understanding of the project's semantic structure, its underlying interdependencies, and the role of specific requirements. It is up to the decision maker how the final decision looks like. As a conclusion, SODA is a means to explore the decision problem. Through the definition of threshold values for eigenvector centrality, coupling, and cohesion, it allows for a rule-based identification of requirements clusters that represent outsourcing candidates. The quality of these identified outsourcing candidates ultimately depends on the ability of the decision maker to set these thresholds and judge the situation. It is to a certain extent subject to his or her experience.

4 Evaluation and Discussion

Our method is a mixture of experimental and descriptive approaches. The experimental simulation addresses the formal core of our decision support method and provides evidence for fulfilling the solution criteria (clustering quality, scalability, and enhancement) as introduced in Sect. 1. The simulation was performed using data from four student projects. The projects have been conducted within the context of a lecture for master students in IS. Students were meant to develop a computer game based on prescribed requirements. The project teams had to use a collaboration platform and were incentivized to exploit its functionality, so all of them maintained requirements interdependencies. These were recorded based on the students' judgment of what adequate semantic relations are. This data set was particularly suitable to investigate how a varying combinatorial structure of semantically identical sets of requirements determined the prototype's output.

4.1 Analysis of Correlation

Table 1 lists the results of applying the prototype on all four projects. The input parameters consist of the requirements representation model (RRM) as introduced in Sect. 3.2, essentially the set of requirements V and the set of interdependencies E. Instead of weighted edges, parallel edges are used inside the collaboration platform of the teams. Consequently, the edge weight is one for all edges and projects and can thus be neglected. The prototype has been applied on the general RRM, i.e. including both interdependency types *requires* and *similar_to*. The computer program that had to be developed by the students was identical across all projects. The individual sets of requirements are, thus, semantically equivalent. However, certain requirements slightly vary in their naming and granularity which is why Project D features 46 requirements as opposed to the remaining projects that have 45. This is negligible.

More important is the fact that all groups maintained requirements interdependencies independently of one another which resulted in four different combinatorial structures of the RRM. Hence, the output parameters reflect the difference in that structure. They comprise the major output figures the prototype generates including achievable modularity Q_{max}, the optimal partition P, the set of critical requirements CR, the average centrality EC, and the set of outsourcing candidates OC. The identification of outsourcing candidates is based on a cohesion threshold of 10.0, a coupling threshold of 0.70, and a centrality threshold of 0.25 (cf. Sects. 3.4.3 and 3.4.4).

Table 2 is a correlation matrix that shows the correlation between the input parameters and the output parameters (upper part) and that between the output parameters (lower part). It is based on Table 1. Notably, it has to be interpreted with care as the data set employed is fairly small, homogeneous with respect to the projects under investigation, and does stem from student projects rather than a

Table 1 Results of experimental simulation

Project	Input		Output				
	$\|V\|$	$\|E\|$	Q_{max}	$\|P\|$	$\|CR\|$	$\overline{EC}$	$\|OC\|$
A	45	61	0.71	10	2	0.07	7
B	45	43	0.67	8	1	0.08	4
C	45	181	0.54	6	5	0.09	3
D	46	49	0.65	8	2	0.10	4

V denotes set of requirements, E denotes set of interdependencies, Q_{max}denotes achievable modularity, P denotes Optimal partition, CR denotes set of critical requirements, $\overline{EC}$denotes average centrality, OC denotes set of outsourcingcandidates.

Table 2 Correlation matrix

		Output				
		Q_{max}	$\|P\|$	$\|CR\|$	$\overline{EC}$	$\|OC\|$
Input	$\|V\|$	0.07	0.00	−0.19	0.77	−0.19
	$\|E\|$	−0.90	−0.75	0.98	0.20	−0.49
Output	Q_{max}		0.95	−0.89	−0.55	0.81
	$\|P\|$			−0.71	−0.63	0.94
	$\|CR\|$				0.30	−0.44
	$\overline{EC}$					−0.75

business environment. Hence, the conclusions derived from the correlation matrix can be primarily considered as tendencies instead of generalizable statements.

To test whether the correlation statistically holds, a t-test is employed to check the two-sided significance of each correlation coefficient (Rasch et al. 2010). A t-test requires normally distributed data. At a significance level of 5 %, the Kolmogorov-Smirnov-Test verifies this pre-condition (van den Honert 1999). The correlation coefficients which the t-test proves significant at a level of 5 % are printed bold. As can be observed, only $\rho(|E|, |CR|)$ and $\rho(Q_{max}, |P|)$ fulfill this criterion which is due to the very limited sample size.

In any case, the correlation between the number of requirements and any of the other parameters appears negligible. More interesting is the correlation of the set of interdependencies with the achievable modularity, the optimal partition, and the set of critical requirements. As a result of many interdependencies, a more densely connected graph apparently induces a lower modularity $(\rho(|E|, Q_{max}) = -0.90)$, fewer clusters in the optimal partition $(\rho(|E|, |P|) = -0.75)$, and more requirements whose centrality lies above the defined threshold $(\rho(|E|, |CR|) = 0.98)$. In the latter and statistically significant case, this is a consequence of centrality being ultimately driven by vertex degree. In case of more interdependencies, degrees turn out to be higher since more vertices become part of the network's core.

Whether this finding justifies an adjustment of the centrality threshold based on the interdependency set's magnitude is, however, questionable. Nonetheless, it reveals a potential problem associated with the centrality metric that requires further investigation on a broader data basis.

The previously mentioned correlation coefficients $\rho(|E|, Q_{max})$ and $\rho(|E|, |P|)$ can be examined against the background of the correlation between achievable modularity and number of clusters. It is almost linear ($\rho(Q_{max}, |P|) = 0.95$) and statistically significant. It suggests that more interdependencies lead to a more coarse-grained partition of the graph. Achievable modularity Q_{max} turns out lower as a logical result of the algorithm finding only larger and hence fewer community structures. The question that comes up in this context is how clustering quality is affected by that constellation. In other words, do large sets of interdependencies yield a better or worse clustering quality. This is investigated in the subsection below.

Another interesting, yet not statistically significant aspect is the positive correlation between the achievable modularity and the number of outsourcing candidates ($\rho(Q_{max}, |OC|) = 0.81$). It suggests that modularity is a suitable indicator for the existence of outsourcing candidates. Notably, the actual number of these candidates is ultimately determined by the parameter thresholds, but given they are consistent across all projects, it would be interesting to examine whether this tendency is reinforced in a broader data set. Here, it can only be assumed from that observation that global modularity is a good indicator for the existence of outsourcing candidates.

4.2 Analysis of Clustering Quality

Turning back to the aspect of clustering quality, a second experiment has been performed that applies an objective criterion to measure the quality of the clustering algorithm. It is called Rand index (RI) (Rand 1971) and "[…] appears to be one of the most popular alternatives for comparing partitions" (Hubert and Arabie 1985, pp. 193–194). It attempts to quantify how well a clustering algorithm is capable to retrieve the "natural" structure inside data (Rand 1971). We consider that "natural" structure to be the ground truth in our analysis. Given a pair of data items, the metric assesses the degree of agreement between this ground truth and a generated partition.

The goal of this test is to investigate whether the number of interdependencies impacts on clustering quality and, if so, how. The ground truth had to be created consistently for each of the four projects (since their sets of requirements slightly differ). The creation was carried out by the experimenter.

The measure relies on a pairwise comparison of requirements r_1 and r_2 and a subsequent classification of this pair into one of four classes. *True positive* comprises pairs where r_1 and r_2 are correctly located in the same cluster, while 'correctly' denotes the same cluster matching of the ground truth and the generated partition. *True negative* refers to pairs where r_1 and r_2 are correctly located in

Table 3 RI for measurement of clustering quality

Project	True positive	True negative	False positive	False negative	Total	Rand index
A	63	727	27	173	990	0.80
B	135	700	37	118	990	0.84
C	113	653	106	118	990	0.77
D	93	753	61	128	1035	0.82

different clusters. *False positive* quantifies those pairs where r_1 and r_2 are incorrectly placed in the same cluster. Finally, *false negative* describes pairs where r_1 and r_2 are incorrectly placed in different clusters. Summing up all classes, their total equals the number of pairs that can be constructed from a set of requirements.

To accelerate this test, the prototype was extended with a functionality to determine the RI of the algorithmically generated partition compared to any constructed ground truth partition. Table 3 lists the results. The RI ranges between 0.77 and 0.84. Determining the correlation of the clustering quality and the number of interdependencies $\rho(|E|, RI)$ results in a value of -0.89. This suggests that more interdependencies yield worse clustering quality. However, beside the fact that this correlation coefficient is statistically not significant, this can also be a consequence of subjective error since the ground truth was created by a single person for each project. Statistically, correlation is zero, so it can be concluded that the clustering quality is independent of the number of interdependencies for the given sample.

The differences in the individual generated partitions that can be observed mainly consist in more fine-grained partitions than this is the case for the ground truth. Simply merging individual clusters gives a good approximation of the ground truth which is why the RI reports a good clustering quality for all projects.

Project C which has by far the most interdependencies also exhibits the coarsest granularity with only six clusters in its partition. Whether this is desirable, remains speculative. What can be said is that group C put the most effort into interdependency maintenance. The benefit of this investment is not clear. This, in turn, is encouraging with respect to the effort necessary to set up the prototype. It suggests that even in a business environment, the required effort might lie within manageable boundaries because fewer interdependencies apparently allow for results of satisfying quality.

In contrast, project D featured 46 requirements with significantly less interdependencies than C. Beside the surprisingly good clustering quality as indicated by the RI, an important finding is that clustering quality is not necessarily better in a model that has a larger set of interdependencies. This is particularly promising given the previously mentioned problem of costly interdependency identification. Thus, we can infer from our experimental simulation that the postulated requirements of good clustering quality and scalability (cf. Sect. 1) are fulfilled by our method under laboratory conditions.

The third requirement of perceived enhancement could not be validated in these laboratory conditions. We believe that SODA's major challenges are located in the

last step that pertains to the structural analysis of requirements clusters and the subsequent recommendation of outsourcing candidates. Although the rule-based approach assures consistency, its expressiveness is limited due to the fact of scarce research. Moreover, SODA is highly dependent on human input as the quality of its suggestions is essentially induced by the quality of the underlying model and the threshold values that have been defined by the user. With regard to the model, we can conclude that the inference capabilities are driven by the quality of the underlying interdependencies. Interdependencies are the most critical element within the decision support method developed here. They predominantly determine the combinatorial structure of the model. Hence, the results SODA produces are very sensitive to the input it receives. Another problematic aspect is the lack of reference values for outsourcing decisions. As a logical conclusion, the quality of SODA's recommendations is similarly sensitive to the threshold values as it is to the model itself.

It shall be stressed that SODA does not propose a software architecture. It is grounded on the argumentation that it is beneficial to understand a software system from a semantic perspective. Clustering of requirements can lead to a modular design (Li et al. 2009) but design is subject to more factors than just semantic relations. To investigate its potential outside of the laboratory, we plan to conduct a qualitative case study that builds upon requirements data from a business setting and benefits from expert judgments, especially targeting at evaluating to what extent SODA does perceivably enhance the outsourcing decision process in a SME.

5 Conclusion

We have introduced and demonstrated SODA, a decision support method and tool that support decision makers in analyzing the outsourcing suitability of requirements from an ISD perspective and leverage the location dependent sourcing decision problem. SODA builds on existing research in that it represents a cross-discipline artifact that draws from the research streams of IS outsourcing, requirements engineering, and graph theory. SODA constitutes a three-step approach, including graph-based modeling of requirements and their semantic interdependencies, model clustering, and structural analysis of clusters and requirements through a set of structural metrics. Based on these metrics, it performs a rule-based recommendation of outsourcing candidates. These candidates can now be related to arguments from theoretic outsourcing models which allow the formulation of outsourcing priorities. For instance, candidates which focus on non-specific tasks are better candidates for outsourcing that those that involve highly specific assets.

The evaluation results reflect the novelty, robustness and scalability of the approach. Overall, it indicates that SODA is applicable for the identification of outsourcing candidates. This, however, needs to be analyzed not solely from a laboratory but rather from a field perspective. Its strengths are located in the representation and clustering of requirements. Its main weakness pertains to the set

of structural metrics. Because this field is notoriously understudied, there is little knowledge SODA can draw from which induces a substantial degree of uncertainty. Furthermore, a qualitative case study will shed more light on the practical usefulness of our approach.

References

Al-Otaiby, T. N., & AlSharif, M. (2007). *Software requirements modularization using partitioning clustering technique*: *Proceedings of the 45th annual Southeast Regional Conference,* (pp. 65–69).

Al-Otaiby, T. N., AlSharif, M., & Bond, W. P. (2005). *Toward software requirements modularization using hierarchical clustering techniques*: *Proceedings of the 43rd Annual Southeast Regional Conference, Kennesaw, GA, USA,* (Vol. 2, pp. 223–228): ACM-SE.

Al-Otaiby, T. N., Bond, W. P., & AlSharif, M. (2004). *Software modularization using requirements attributes*: *Proceedings of the 42nd Annual Southeast Regional Conference, Huntsville, AL, USA, 2004* (pp. 104–109): ACM-SE.

Al-Qirim, N. A. Y. (2003). The strategic outsourcing decision of IT and eCommerce: The case of small businesses in New Zealand. *Journal of Information Technology Cases and Applications, 5*(3), 32–56.

Baldwin, C. Y., & Clark, K. B. (2000). *Design rules: the power of modularity*. Cambridge, USA: MIT Press.

Borowiecki, M. (2011). Partitions of graphs. In M. Dehmer (Ed.), *Structural analysis of complex networks* (pp. 27–47). Boston, MA, USA: Birkhäuser Boston.

Briand, L., Morasca, S., & Basili, V. (1996). Property-based software engineering measurement. *IEEE Transactions on Software Engineering, 22*(1), 68–86.

Carmel, E., & Nicholson, B. (2005). Small firms and offshore software outsourcing: High transaction costs and their mitigation. *Journal of Global Information Management, 13*(3), 33–54.

Dahlstedt, S. G., & Persson, A. (2005). Requirements interdependencies: State of the art and future challenges. In A. Aurum, & C. Wohlin (Eds.), *Engineering and Managing Software Requirements* (pp. 95–116). Berlin: Springer.

Damian, D., Kwan, I., & Marczak, S. (2010). Requirements-driven collaboration: Leveraging the invisible relationships between requirements and people. In I. Mistrík, A. van der Hoek, J. Grundy, & J. Whitehead (Eds.), *Collaborative software engineering* (pp. 57–76). Berlin, Germany: Springer.

de Souza, C., Hildenbrand, T., & Redmiles, D. (2007). Toward visualization and analysis of traceability relationships in distributed and offshore software development projects. In B. Meyer & M. Joseph (Eds.), *Software engineering approaches for offshore and outsourced development* (pp. 182–199). Berlin: Springer.

Dedrick, J., Carmel, E., & Kraemer, K. L. (2011). A dynamic model of offshore software development. *Journal of Information Technology, 26*, 1–15.

Dibbern, J., Goles, T., Hirschheim, R., & Jayatilaka, B. (2004). Information systems outsourcing: A survey and analysis of the literature. *Communications of the ACM, 35*(4), 6–102.

Dibbern, J., & Heinzl, A. (2001). Outsourcing of information systems functions in small and medium sized enterprises: A test of a multi-theoretical model. *WIRTSCHAFTSINFORMATIK, 43*, 339–350.

Dibbern, J., Heinzl, A., & Leibbrandt, S. (2003). Interpretation des sourcings der informationsverarbeitung: Hintergründe und Grenzen ökonomischer Einflussgrößen. *WIRTSCHAFTSINFORMATIK, 45*(5), 533–540.

Dibbern, J., Winkler, J., & Heinzl, A. (2008). Explaining variations in client extra costs between software projects offshored to India. *MIS Quarterly, 32*(2), 1–30.

Fitsilis, P., Gerogiannis, V., Anthopoulos, L., & Savvas, I. (2010). *Supporting the requirements prioritization process using social network analysis techniques*: *Proceedings of the 45th Annual Southeast Regional Conference* (pp. 110–115).

Fjällström, P.-O. (1998). Algorithms for graph partitioning: A survey. *Linköping Electronic Articles in Computer and Information Science, 3*(10), 1–37.

Grant, R. M. (1991). The resource-based theory of competitive advantage: Implications for strategy formulation. *California Management Review, 33*(3), 114–135.

Gross, J. L., & Yellen, J. (2004). Fundamentals of graph theory. In J. L. Gross & J. Yellen (Eds.), *Handbook of graph theory* (pp. 2–19). Boca Raton, FL, USA: CRC Press.

Heim, P., Lohmann, S., Lauenroth, K., & Ziegler, J. (2008). *Graph-based visualization of requirements relationships*: *Proceedings* of the *3rd International Workshop* on *Requirements Engineering Visualization* (pp. 51–55).

Hildenbrand, T. (2008). *Improving traceability in distributed collaborative software development*. Frankfurt: Lang.

Hubert, L., & Arabie, P. (1985). Comparing partitions. *Journal of Classification, 2*(1), 193–218.

Kirsch, L. J., Sambamurthy, V., Ko, D.-G., & Purvis, R. L. (2002). Controlling information systems development projects: The view from the client. *Management Science, 48*(4), 484–498.

Klimpke, L., Kramer, T., Betz, S., & Nordheimer, K. (2011). *Globally distributed software development in small and medium-sized enterprises in Germany: Reasons, locations, and obstacles*: *Proceedings of the 19th European Conference on Information Systems (ECIS2011), Helsinki, Finland*.

Kramer, T., & Eschweiler, M. (2013). Outsourcing location selection with SODA: A requirements based decision support methodology and tool. In C. Salinesi, M. C. Norrie, & O. Pastor (Eds.), *Advanced information systems engineering: 25th international conference, CAiSE Valencia, Spain, 2013* (pp. 530–545). Heidelberg: Springer.

Kramer, T., Heinzl, A., & Spohrer, K. (2011). Should this software component be developed inside or outside our firm?—a design science perspective on the sourcing of application systems. In J. Kotlarsky, L. P. Willcocks, & O. Ilan (Eds.), *New studies in global it and business service outsourcing: 5th global scourcing workshop 2011, Courchevel, France, March 14–17, 2011, revised selected papers* (pp. 115–132). Heidelberg, Dordrecht, London, New York: Springer.

Langlois, R. N. (1995). Capabilities and coherence in firms and markets. In C. A. Montgomery (Ed.), *Resource-based and evolutionary theories of the firm: Towards a synthesis* (pp. 71–100). USA: Boston.

Larman, C. (2002). *Applying UML and patterns* (2ed.). Upper Saddle River, NJ, USA: Prentice Hall.

Li, Z., Rahman, Q., Ferrari, R., & Madhavji, N. (2009). Does requirements clustering lead to modular design? In M. Glinz, & P. Heymans (Eds.), *Requirements engineering: Foundation for software quality* (pp. 233–239). Berlin: Springer.

Luxburg, U. (2007). A tutorial on spectral clustering. *Statistics and Computing, 17*(4), 395–416.

Manning, C. D., Raghavan, P., & Schütze, H. (2008). *Introduction to information retrieval* (1ed.). Cambridge, UK: Cambridge University Press.

Moreira, A., & Araújo, J. (2011). The need for early aspects. In J. Fernandes, L. R., J. Visser, & J. Saraiva (Eds.), *Generative and transformational techniques in software engineering III* (pp. 386–407).

Moreira, A., Araújo, J., & Brito, I. (2002). *Crosscutting quality attributes for requirements engineering*: Proceedings of the *14th International Conference on Software Engineering and Knowledge Engineering, SEKE '02, Ischia, Italy,* (pp. 167–174).

Newman, M. E. J. (2006). *Modularity and community structure in networks*: *Proceedings of the National Academy of Sciences of the United States of America* (pp. 8577–8582).

Peffers, K., Tuunanen, T., Rothenberger, M. A., & Chatterjee, S. (2007). A design science research methodology for information systems research. *Journal of Management Information Systems, 24*(3), 45–78.

Picot, A., & Baumann, O. (2007). Modularität in der verteilten Entwicklung komplexer Systeme: Chancen, Grenzen. *Implikationen. Journal für Betriebswirtschaft, 57*(3–4), 221–246.

Rand, W. M. (1971). Objective criteria for the evaluation of clustering methods. *Journal of the American Statistical Association, 66*(336), 846–850.

Rasch, B., Friese, M., Hofmann, W., & Naumann, E. (2010). *Quantitative Methoden 1* (3ed.). Berlin: Springer.

Schilling, M. A., & Steensma, H. K. (2001). The use of modular organizational forms: An industry-level analysis. *The Academy of Management Journal, 44*(6), 1149–1168.

Simon, H. A. (1955). A behavioral model of rational choice. *The Quarterly Journal of Economics, 69*(1), 99–118.

Simon, H. A. (1962). *The architecture of complexity*: *Proceedings of the American Philosophical Society* (Vol. 106, pp. 467–482).

Stratman, J. K. (2008). Facilitating offshoring with enterprise technologies: reducing operational friction in the governance and production of services. *Journal of Operations Management, 26*(2), 275–287.

Tarr, P., Ossher, H., Harrison, W., & Sutton, S. M., J. (1999). *N degrees of separation: multi-dimensional separation of concerns*: *International Conference on Software Engineering, Los Angeles, CA, USA,* (pp. 107–119).

Teng, J. T. C., Cheon, M. J., & Grover, V. (1995). Decisions to outsource information systems functions: testing a strategy-theoretic discrepancy model. *Decision Sciences, 26*(1), 75–103.

Tiwana, A. (2008). Does technological modularity substitute for control? A study of alliance performance in software outsourcing. *Strategic Management Journal, 29*(7), 769–780.

van den Honert, R. (1999). *Intermediate statistical methods for business and economics* (2ed.). Rondebosch, South Africa: Juta and Company.

Williamson, O. E. (1990). Transaction cost economics. In R. Schmalensee & R. D. Willig (Eds.), *Handbook of industrial organization* (pp. 135–182). Netherlands: Amsterdam.

Yalaho, A. (2006). *A conceptual model of ICT-supported unified process of international outsourcing of software production*: *10th IEEE International Enterprise Distributed Object Computing Conference Workshops EDOCW* (pp. 47–58).

Yaung, A. T. (1992). *Design and implementation of a requirements clustering analyzer for software system decomposition*: *Proceedings of the 1992 ACM/SIGAPP Symposium on Applied Computing: Technological Challenges of the 1990s, 1992* (pp. 1048–1054).

Yong, L., Gencheng, G., & Jingjing, Q. (2008). *An algorithm of system decomposition based on laplace spectral graph partitioning technology*: *International Conference on Computer Science and Software Engineering, Wuhan, China* (Vol. 2, pp. 85–89).

Part III
Dynamic Governance Adaptation

The Emergence of Formal Control Specificity in Information Systems Outsourcing: A Process-View

Thomas L. Huber, Thomas A. Fischer, Laurie Kirsch and Jens Dibbern

Abstract Information systems (IS) outsourcing projects often fail to achieve initial goals. To avoid project failure, managers need to design formal controls that meet the specific contextual demands of the project. However, the dynamic and uncertain nature of IS outsourcing projects makes it difficult to design such specific formal controls at the outset of a project. It is hence crucial to translate high-level project goals into specific formal controls during the course of a project. This study seeks to understand the underlying patterns of such translation processes. Based on a comparative case study of four outsourced software development projects, we inductively develop a process model that consists of three unique patterns. The process model shows that the performance implications of emergent controls with higher specificity depend on differences in the translation process. Specific formal controls have positive implications for goal achievement if only the stakeholder context is adapted, while they are negative for goal achievement if in the translation process tasks are unintendedly adapted. In the latter case projects incrementally drift away from their initial direction. Our findings help to better

This paper is an extension of: Huber, T., Fischer, T., Kirsch, L., and Dibbern, J. (2014), Explaining Emergence and Consequences of Specific Formal Controls in IS Outsourcing—A Process-View, 47th Hawaii International Conference on System Sciences (HICSS), Waikoloa, Hawaii.

T.L. Huber (✉) · T.A. Fischer · J. Dibbern
University of Bern, Bern, Switzerland
e-mail: Thomas.Huber@iwi.unibe.ch

T.A. Fischer
e-mail: Thomas.Fischer@franke.com

J. Dibbern
e-mail: Jens.Dibbern@iwi.unibe.ch

L. Kirsch
University of Pittsburgh, Pittsburgh, USA
e-mail: LKirsch@katz.pitt.edu

R. Hirschheim et al. (eds.), *Information Systems Outsourcing*, Progress in IS,
DOI 10.1007/978-3-662-43820-6_7

understand control dynamics in IS outsourcing projects. We contribute to a process theoretic understanding of IS outsourcing governance and we derive implications for control theory and the IS project escalation literature.

Keywords Process theory · Control theory · Case study · Coevolution · Specificity · Translation process

1 Introduction

IS projects often fail to achieve their goals (Banker and Kemerer 1992; Keil et al. 2000; Lee et al. 2012). In many cases, failing IS projects seem to take on a life of their own (Lee et al. 2012). Despite the trouble they cause, they are often not redirected or abandoned, instead, they continue to bind valuable resources (Keil et al. 2000; Lee et al. 2012). Such project escalations may be avoided by adequately controlling IS projects (Banker and Kemerer 1992; Kirsch 1997b). Control can be exercised through management-initiated *formal mechanisms* like the assessment of performance based on defined outcomes or behaviors (Eisenhardt 1985; Kirsch 1997b; Ouchi 1979) or through *informal mechanisms*, such as spontaneous meetings between software developers (Eisenhardt 1985; Kirsch 2004; Ouchi 1979). Prior research examining *internal* IS projects suggests that the exercise of control positively influences goal achievement if managers design controls that fit the project context as reflected by characteristics of the task or the controller (Eisenhardt 1985; Kirsch 2004; Kirsch and Cummings 1996; Ouchi 1979; Tiwana and Keil 2009). While solid empirical support could be found for the positive link between controls and goal achievement for internal IS projects (Kirsch and Cummings 1996; Tiwana and Keil 2009), the situation appears different in outsourced IS projects (Tiwana and Keil 2009). In fact, a recent study revealed that even extensively controlled outsourced software development projects that fit with contextual demands often fail to achieve high-level project goals (Tiwana and Keil 2009).

The reason for this failure may lie in the dynamic, complex, and uncertain nature of IS outsourcing projects (Choudhury and Sabherwal 2003; Rustagi et al. 2008). Outsourcing faces the challenge of bringing together two parties with rather different resources and partially opposing objectives. This makes it difficult to mutually agree on formal controls (Tiwana and Keil 2009). What is more, managers often have only limited knowledge about the concrete expected outcomes and how they may be achieved (Dibbern et al. 2008; Gregory et al. 2013; Tiwana and Keil 2009). And yet client and vendor need to agree on particular project goals right from the beginning as these goals become part of the outsourcing contract (Chen and Bharadwaj 2009). As a result, goals are often rather openly formulated in terms of high-level properties of the project (e.g., duration, budget and people) and of the information system to be developed, operated or maintained by the

vendor (e.g., its function, form, and quality). Accordingly, when an IS outsourcing project starts, formal controls are rather imperfectly or incompletely defined, thus, managers lack effective formal controls (Gregory et al. 2013).

One alternative to defining specific formal controls may be to rely mostly on informal control (Kirsch 1997b; Kirsch 2004; Kirsch et al. 2002) which would allow to flexibly react to specific problems arising in the IS development process (Tiwana 2010). However, for outsourced IS projects, relying mostly on informal control is often infeasible. First, controllers and controlees work in different organizations. The lack of co-location or proximity inhibits the use of informal control which often rests on close personal interaction. Second, outsourced projects are frequently business-critical which often forces managers to tightly control projects in a formal way. Such control pressure is reinforced by regulatory standards at the industry level (e.g., in banking) (Gewald and Dibbern 2009) or at the international level (e.g., the Sarbanes-Oxley Act) with which client and vendor have to comply (Dunbar and Phillips 2001). Thus, formal control may be both more crucial and more difficult to design at the outset of IS outsourcing projects.

Given the difficulties of designing formal controls at the outset of outsourced IS projects, controls may need to be adapted and refined over time to precipitate a fit with the project context (Ouchi 1979; Siggelkow 2002). More specifically, managers may incrementally translate high-level project goals into tangibly measurable outcomes and behaviors to design more specific controls that fit with the contextual demands of a project. For instance, in software development the high level requirements may be translated into more detailed deliverables that are tangibly measurable *during* the software development process.

Surprisingly little is known about how this translation process occurs and how the development of more specific controls feeds back into the project and influences project success. Given this void of research on this evolutionary process of the generation of specific controls and their impact on project success, we conduct an exploratory study guided by the following research questions: *How are high-level project goals translated into more specific formal controls in outsourced IS projects? And, following on from that, how does the exercise of specific formal controls influence the success of IS outsourcing projects, i.e. to the achievement of high-level project goals*?

To answer these two questions, we begin with developing our research framework that conceptualizes the translation process as control-context interactions, and control specificity as the outcome of this translation process. The framework provides the basis for our exploratory case study of four outsourced software development projects in a major international bank. Our empirical investigation reveals three unique patterns that differ with respect to the contextual changes and their interactions with control specificity as well as the consequences on project success that accrue from these interactions. We next introduce the conceptual foundations of our study and our initial theoretical framework.

2 Background Literature

2.1 High-Level IS Project Goals

At the beginning of IS projects, managers set high-level project goals (Abdel-Hamid et al. 1993; Keil 1995; Keil et al. 1998, 2000; Lee et al. 2012). Typically, four types of high-level IS project goals are distinguished (Banker and Kemerer 1992): In the short run *development cost should not exceed budget* and *systems should be delivered on time*. In the long run the *effort for maintaining the system should be low* and the *system should successfully satisfy user requirements* (cf. Appendix 6 for a detailed overview of those four goal types).

While IS projects are typically conducted to attain multiple high-level project goals, there are known trade-offs between those goals, and therefore their relative importance differs between projects, i.e. IS projects typically have a primary goal. For instance, some IS projects are mainly driven by cost considerations while other IS projects aim at effectively fulfilling idiosyncratic end-user requirements (Abdel-Hamid et al. 1999). Prior research has shown that the perceived success of IS projects mainly depends on whether or not those initially set high-level project goals are achieved (even if those goals change during the course of a project) (Lee et al. 2012; Linberg 1999).

In many cases those high-level project goals are not achieved, i.e. IS projects come in over budget, late, are costly to maintain, and do not satisfactorily meet user requirements (Kirsch 1997a; Kirsch 1996). This failure to achieve initial high-level project goals is especially prevalent in outsourced IS projects (Dibbern et al. 2008; Lacity et al. 2009). To ensure that IS outsourcing projects achieve expected goals, control has been proposed as the pivotal tool for managers (Dibbern et al. 2008; Lacity et al. 2009; Rustagi et al. 2008). In particular, prior research has suggested that the degree of association between initial high-level project goals and their successful achievement may be mediated by how adequately controls direct behavior to achieve those goals (Abdel-Hamid et al. 1993; Banker and Kemerer 1992; Kirsch 1997b).

2.2 Formal and Informal Control

Control is defined as a set of mechanisms that is used to motivate individuals to achieve desired project goals (Jaworski 1988; Kirsch 1996; Kirsch 1997b; Ouchi 1979). Two modes of control mechanisms are distinguished—formal and informal (Kirsch 1997b; Ouchi 1979). Formal mechanisms comprise of management-initiated official mechanisms (Cardinal et al. 2010) that are exercised by a controller over a controlee (Kirsch 2004). Such superior-subordinate relationships are typically defined in organizational roles and responsibilities (Cardinal et al. 2004; Kirsch 2004). In the context of IS outsourcing the client company takes the role of

Table 1 Conceptualization of formal and informal control in is outsourcing projects

Control mode	Definition	Based on
Formal control	Formal control refers to formally documented and management initiated mechanisms. *Formal control* is exercised through either *outcome* or *behavior control mechanisms* where the client expects the vendor to achieve defined outcomes or to follow prescribed behaviors	(Cardinal et al. 2004; Chua et al. 2012; Jaworski 1988; Kirsch 1997b, 2004; Kirsch et al. 2002; Rustagi et al. 2008)
Informal control	Informal control refers to control that is unwritten and typically worker-initiated. *Informal control* is exercised through either *clan* or *self control mechanisms* where individuals or group members self-regulate behaviors	(Cardinal et al. 2004; Chua et al. 2012; Jaworski 1988; Kirsch 1997b, 2004; Kirsch et al. 2002)

the controller, whereas the vendor company takes the role of the controlee (Rustagi et al. 2008). Formal control can be exercised through behavior or outcome control: Behavior control comprises of defining pre-specified steps or procedures, and evaluating controlees' performance according to the adherence to such steps or procedures (Eisenhardt 1985; Kirsch 1997b; Kirsch 2004; Kirsch et al. 2002; Ouchi 1979). Outcome control comprises of defining outputs or targets, and evaluating controlees' performance based on the extent to which they are met (Eisenhardt 1985; Kirsch 1997b; Kirsch 2004; Kirsch et al. 2002; Ouchi 1979).

Informal control comprises of undocumented unofficial mechanisms (Jaworski 1988; Kirsch 2004) that are based on social or people strategies (Eisenhardt 1985). These strategies focus on the role of values that allow an individual to set his or her own goals and self-monitor achievement (self control), or they focus on a group to reinforce acceptable behaviors by socializing and mutually adjusting to each other (clan control) (Cardinal et al. 2004; Kirsch 1997b; Ouchi 1979; Tiwana and Keil 2009). Table 1 gives an overview of the different types of formal and informal controls.

Typically, formal and informal control are used in combination in the form of a control portfolio (Kirsch 1997b). From a theoretical point of view, the *effective* composition of this portfolio is contingent upon the particular context of an IS project (Eisenhardt 1985; Ouchi 1979). More specifically, it has been argued that in order to realize desired goals, it is necessary to design controls that "fit" with context factors. Two categories of context factors can be distinguished: task-related and stakeholder-related (Eisenhardt 1985; Kirsch 1997b; Ouchi 1979) (cf. Table 2 for a detailed overview of the different types of task- and stakeholder-related context factors). Control theory holds that depending on the value of those context factors, managers should rely on either formal or informal mechanisms (Eisenhardt 1985; Kirsch 1996; Ouchi 1979). For instance, if an IS task is highly uncertain, then, it is

Table 2 Task- and stakeholder-related context factors

Context factor	Definition	Control theory predictions: if the context factor increases controllers will increase the use of…
Task-related context factors		
Behavior observability	The extent to which the client has access to information that reveals vendor's individual behaviors and actions (adapted from Kirsch et al. 2002)	… behavior control (Kirsch 1997b; Kirsch et al. 2002; Ouchi 1979)
Outcome measurability	The client's ability to measure outcomes and results (adapted from Kirsch et al. 2002)	… outcome control (Kirsch 1997b; Kirsch et al. 2002; Ouchi 1979)
Task uncertainty	The degree to which the specific requirements or intermediate outcomes associated with a task or activity cannot be anticipated or forecasted (Rustagi et al. 2008)	… outcome control or clan control (if outcomes difficult to measure) (Eisenhardt 1985)
Task interdependence	Task interdependence refers to the interconnection between tasks, and the performance of one's work that is dependent on the completion of others' work (Thompson 1967)	… informal control (Thompson 1967; Van de Ven et al. 1976)
Stakeholder-related context factors		
Client's knowledge	The extent to which the client understands (1) the behaviors needed to transform inputs into outputs during the systems development process (adapted from Kirsch et al. 2002) (2) technical issues and vendor processes (based on Rustagi et al. 2008), and (3) relationship management issues (based on Lacity et al. 1996; Rustagi et al. 2008)	… behavior or outcome control (Kirsch 1996; Kirsch et al. 2002; Rustagi et al. 2008)
Shared understanding between client and vendor	Shared understanding refers to a mutual agreement about processes, project goals, operational approaches, work practices, and the functionality of the applications and systems (Chua et al. 2012; Gregory et al. 2013; Kirsch 2004)	… formal (outcome, behavior) or informal control (clan, self) (Chua et al. 2012; Gregory et al. 2013; Kirsch 2004)
Trust	Trust refers to positive expectations between client and vendor personnel with respect to motives and abilities to perform a task (Kirsch et al. 2010; Rousseau et al. 1998; Sabherwal 1999).	… clan control (Gregory et al. 2013; Kirsch et al. 2010)

more difficult to anticipate the behaviors needed to successfully accomplish that task (Eisenhardt 1985). Thus, managers should rather rely on outcome or clan control instead of behavior control (Eisenhardt 1985). In contrast, if a manager has profound knowledge about desired intermediate outcomes or about the behaviors needed to successfully perform a task, they are recommended to rely on formal control (Kirsch et al. 2002).

2.3 *Formal Control in IS Outsourcing: More Difficult and More Needed*

Prior empirical research has shown that formal controls prevail in IS outsourcing (Choudhury and Sabherwal 2003; Kern and Willcocks 2000; Rustagi et al. 2008). This prevalence of formal controls can be attributed to a number of reasons. One is that mainly large organizations outsource IS services. Those companies have a preference for formal control (Cardinal 2001)—partly because of regulatory issues (Quaglia 2007). Moreover, some highly regulated industries like financial services extensively outsource IS services (Fersht 2011; Gewald and Dibbern 2009). Since this often involves business-critical systems and sharing confidential data with a third party (the vendor), strict regulatory rules apply that force managers to formalize controls (Knolmayer 2007; Quaglia 2007). Third, the social and people strategies that informal control is based on are more difficult to exercise when "stakeholders are members of different firms" (Rustagi et al. 2008), are geographically distributed (Choudhury and Sabherwal 2003; Gregory et al. 2013), and experience cultural distance (Dibbern et al. 2008).

Paradoxically, despite the prevalence of formal control in IS outsourcing arrangements, prior research was not able to empirically substantiate the theoretically sound link between the exercise of formal control and the achievement of desired high-level project goals. In fact, a recent study comparing the exercise of control in internal and outsourced IS projects demonstrated that the exercise of control is positively related to performance in internal IS projects, but not in outsourced IS projects (Tiwana and Keil 2009). Moreover, this study showed that controllers in outsourced IS projects have a greater tendency to rely on formal controls (Tiwana and Keil 2009). This suggests that those formal controls may have not been adequately designed to effectively direct behavior towards achieving high-level project goals. This failure to design adequate formal controls may be rooted in the unique difficulties of translating high-level project goals into more specific outcomes and behaviors for outsourced IS projects. These outsourced IS projects are often highly complex, dynamic and exhibit additional uncertainty (Rustagi et al. 2008). Consequently, measurable intermediate outcomes, like detailed technical specifications, are often simply not known when an IS outsourcing project starts (Tiwana 2010). Moreover, client companies often lack the software development experience needed to adequately prescribe how software

should be developed (Mani et al. 2009). Finally, in order to formalize controls between two independent companies the parties have to mutually agree on those controls, which requires a shared understanding about project goals, tasks and operational approaches—this is often missing in IS outsourcing projects (Gregory et al. 2013).

Therefore, despite the fact that formal controls are particularly needed in IS outsourcing, designing them with tangibly measurable outcomes and behaviors is difficult at the outset of such projects. This strongly suggests that such formal controls will not be in place at the beginning of a project, instead, they may rather be designed over the course of a project. Thus, to better understand the translation from high-level project goals into tangibly measurable outcomes and behaviors, the dynamics of control may be essential.

2.4 The Dynamics of Control

While several scholars called for more research on dynamics of control (Cardinal et al. 2010), only a few studies investigated control adaptations over time (Cardinal et al. 2004; Choudhury and Sabherwal 2003; Gregory et al. 2013; Heiskanen et al. 2008; Kirsch 2004; Sabherwal 2003). The majority of these studies have focused on rather disruptive control changes that are determined by stark changes in the context. For example, Kirsch (2004) investigated the change of control choices when a project switched from one phase to another. Similarly, Choudhury and Sabherwal (2003) found "critical events" such as severe performance problems to trigger switches from one control portfolio to another. In a similar vein, Heiskanen et al. (2008) describe how control portfolios oscillate between phases of either trust or control.

While research on control dynamics has produced very valuable results in understanding how control choices change if the context changes, there is a lack of knowledge on how controls are specified in phases of contextual stability. More specifically, the important question of how high-level project goals are deliberately translated into tangibly measurable outcomes and behaviors has not been answered. However, there are first indications that it may be valuable to study such changes. Kirsch (2004) found that mechanisms of formal control differ between projects with respect to how their measurement, evaluation, and reward system is designed. Similarly, Choudhury and Sabherwal found that controls differ not only with respect to the mechanisms applied but also with respect to the precision of how outcomes are specified (2003). While both studies struggled to explain these findings, they are indicative of the conclusion that this unexplained variance in the design of controls might be due to differences in the process of translating high-level project goals into measurable outcomes and behaviors. Thus far, however, this process has not been thoroughly investigated and consequently is not understood. The goal of this study is to close this gap.

3 Initial Theoretical Framework

In order to empirically capture how high-level project goals are translated into more specific outcomes and behaviors, and how the subsequent exercise of the consequent formal controls relates to the achievement of high-level project goals, a research framework is developed in this section. This framework serves to outline, conceptualize and link together the relevant elements for the subsequent empirical investigation. In particular, we develop the tools to describe the translation process (*interactions between controls and the context*), and the outcome of this process (*formal control specificity*).

3.1 The Translation Process: Interactions Between Controls and the Context

In order to empirically capture how high-level project goals are translated into tangibly measurable outcomes and behaviors the notion of incremental change gains center stage since in phases of incremental change something rather general (e.g. a high-level project goal) is elaborated to become more specific (e.g. a measurable outcome or behavior) (Brown and Eisenhardt 1997; Dokko et al. 2012; Gersick 1991). Incremental changes, in contrast to disruptive changes, are not determined by external context forces. Instead, to understand incremental changes the complex interactions between the elements of a system gain center stage (Siggelkow 2002; Thompson 1982; Thompson 1994, 2010). Thus, studying the translation process from high-level project goals into tangibly measurable outcomes and behaviors empirically may require analyzing interactions between the relevant system elements. But what are those relevant system elements? As shown by the empirically well substantiated control theory, the design of formal and informal controls can be best understood in terms of trying to achieve a fit with the context. Therefore, we suggest that the relevant system elements may consist *of controls* (*formal and informal*) and *the context* (*task and stakeholder*). Thus, we expect that managers in IS outsourcing projects strive for achieving a (better) fit between controls and the context by translating high-level project goals into tangibly measurable outcomes and behaviors, and that in this process controls and context interact. Following the reasoning of prior research (Leonardi 2011; Siggelkow 2002) we expect that in these complex interaction processes none of the system elements exerts a deterministic influence on the other, we rather expect that controls and context *mutually* shape each other. For instance, after client and vendor have agreed on high-level project goals and then strive for tangibly measurable outcomes and behaviors, software developers from the client and business analysts from the vendor might meet in a formal meeting (formal control). In this formal meeting client and vendor employees might reach a shared understanding on more detailed, tangibly measurable requirements, i.e. client and vendor actively

adapt the stakeholder context through the exercise of formal control. This knowledge may then be formalized in a requirements document that is subsequently used to evaluate the performance of the vendor, i.e. it becomes the basis of more specific formal control.

3.2 The Translation Outcome: Formal Control Specificity

When Kirsch (2004) and Choudhury and Sabherwal (2003) found initial indications that there might be differences in the process of how high-level project goals are translated into tangibly measurable outcomes and behaviors, they concluded that future studies investigating this phenomenon should "move beyond current conceptualizations" (Kirsch 2004) of formal control. This is due to the fact that the control-theoretic distinction between outcome and behavior control cannot adequately capture differences in the precision of how outcomes and behaviors are specified (Choudhury and Sabherwal (2003)). For example, whether the performance of a client is measured with regard to a high-level project goal or with regard to detailed requirements would make no difference from a control theory perspective—both would simply be formal control.

To empirically capture such subtle differences that make outcomes and behaviors tangibly measurable, we propose the notion of *formal control specificity*. The notion of specificity is very prominent in transaction cost theory (Williamson 1991) where it relates to physical or human assets. Assets are specific if they have a higher value to a particular transaction than they would have if they were redeployed for another transaction (McGuinness 1994). In recent years, research on organizational routines has shown that the specificity concept can be fruitfully transferred to the context of organizational rule systems. This stream of research has argued that routines are specific to the context (Feldman and Pentland 2003). This specificity may be the outcome of unique historical developments (Barney 1991; Becker 2004) or of idiosyncratic local learning processes (Becker 2004). Thus, whether specificity refers to assets or whether the concept is transferred to another phenomenon, the central property is that it limits transferability to other contexts (Becker 2004). Therefore, we define *control specificity* as the extent to which control mechanisms designed to motivate controlees in a particular control situation, have a higher value to that situation, than they would have if they were redeployed for another purpose. Due to the unique difficulties of translating high-level project goals into more specific outcomes and behaviors in IS outsourcing at the outset of a project, we expect formal control specificity to change over time. Accordingly, specificity may increase or decrease over the course of an IS outsourcing project. Derived from the definition provided above, we will refer to an *increase in formal control specificity if a desired outcome or behavior is elaborated, if outcomes and behaviors are prescribed in a more precise manner, if more details are added, if exceptions of a general rule are introduced,* etc., *and* vice versa *for a decrease in formal control specificity*. For instance, setting a precise

requirement that is to be implemented at a precise date would be more specific compared to a "the software has to be delivered in time" type of statement.

A number of different theoretical perspectives suggest that such more specific controls may have positive performance implications for several reasons. First, control theory suggests that managers who adequately specify controls may reach a better fit with the context and therefore better project performance (Eisenhardt 1985; Ouchi 1979). Second, such specific controls may be rare, valuable, and difficult to imitate, and therefore, be a source of sustained competitive advantage (Dyer and Singh 1998; Zaheer and Venkatraman 1994). Third, goal-setting theory holds that goals that are deemed specific, tend to increase performance more than goals that are not (Lee et al. 2012; Locke et al. 1989).

In sum, IS outsourcing projects need formal control. However, at the outset of a project the distinct characteristics of IS outsourcing make it difficult to translate high-level initial project goals into tangibly measurable outcomes and behaviors, i.e. the controls in place may not "fit" the needs of the context. Therefore, controllers in IS outsourcing projects may incrementally precipitate a fit with the context by adapting formal controls over time (cp. Fig. 1, arrow 1). This may be achieved in a translation process that is driven by reciprocal interactions between the relevant system elements (i.e. controls and the context). The outcome of this process may be formal controls with higher levels of specificity (cp. Fig. 1, arrow 1). Then, their subsequent exercise may enable managers to better achieve initial high-level goals. If not, the achievement of those high-level goals may be at risk (cp. Fig. 1, arrow 3). The framework depicted in Fig. 1 summarizes the outlined ideas and is subsequently used to guide our empirical effort to better understand how high-level project goals are translated into tangibly measurable outcomes and behaviors, and how this translation process relates to the achievement of initial high-level goals. The next section describes the methodological approach of this study in more detail.

4 Method

This study aims at developing a process understanding of how high-level project goals are translated into more specific formal controls, and how the subsequent exercise of those controls relates to the achievement of initial high-level project goals. For this purpose, we chose an exploratory comparative case study approach (Benbasat et al. 1987). As suggested by Eisenhardt (1989), we entered the research field with an upfront theory in mind, i.e. the above developed framework and the accompanying conceptualizations of high-level project goals, the notion of interactions between controls (formal, informal) and the context (task, stakeholder) as well as the notion of formal control specificity (cp. Fig. 6).

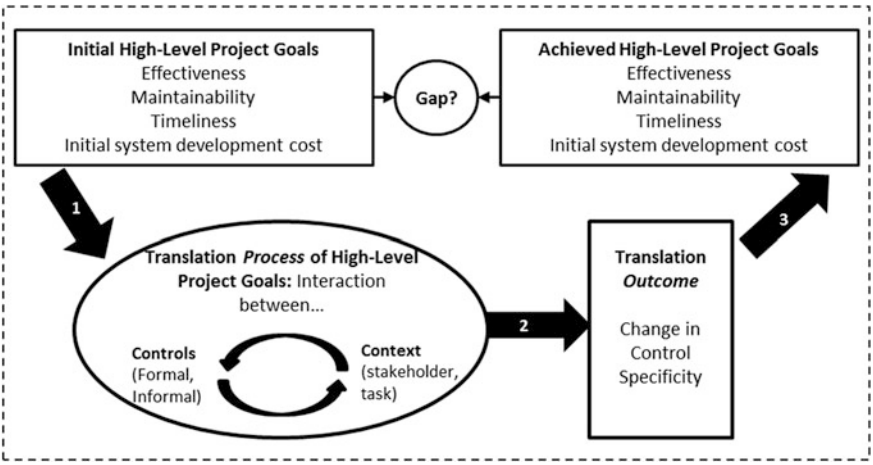


Fig. 1 Framework of translating high-level project goals into more specific formal controls

4.1 Empirical Setting and Case Selection

We use four IS outsourcing cases of the financial services industry as a context to explore how high-level project goals are translated into more specific outcomes and behaviors. IS outsourcing in the financial services industry is an adequate empirical context for our exploration since it is a highly regulated industry in which managers are forced to formalize controls but also have to cope with the dynamics and uncertainties that are common to all IS outsourcing projects. This ensured that in our cases, formal control was, in fact, highly crucial but highly difficult to design, and hence that the translation process from high-level project goals into measurable outcomes and behaviors was of major importance.

Four IS outsourcing projects at a German bank (BANK) were selected. Each project represents a case with a number of embedded cases (Yin 2009). Those embedded cases represent episodes in which initial high-level project goals are translated into more specific formal controls that are subsequently exercised (Kirsch 1996; Newman and Robey 1992). In 2009, the Human Resources (HR) department of BANK gave us the opportunity to choose from about 90 outsourced IS projects. Since one of our major goals was to explore the consequences of more specific controls for the achievement of desired goals, differences in degree of goal achievement were a primary selection criterion. Therefore, two cases were selected that were known for being troubled (CANDIDATE, HIGHPOT), and two cases were selected with a rather smooth project progression (ALUMNI, PAYSLIP). Moreover, *duration* was a primary case selection criterion, i.e., each selected project had to have either already started at least one year ago or was planned to continue for at least two more years. This ensured that the timeframe of each project covered several years and therefore allowed us to conduct a retrospective analysis of translation processes covering several years (Yin 2009). While one objective was

to study changes in the constructs of interest within each case, we also aimed at meaningful comparisons between the selected cases. Especially, the comparison between the "smooth" and the "troubled" cases was expected to give valuable insights into systematic differences between translation processes of cases in which high-level project goals were achieved and cases in which the parties failed to achieve high-level project goals. Thus, to ensure comparability between the cases, we made sure that the cases selected were similar in those dimensions that were not of direct theoretical interest for our research question but were identified as relevant for the exercise of control by prior research. Therefore, all projects needed to be similar in size (Choudhury and Sabherwal 2003; Kirsch 2004), use the same development methodology (Maruping et al. 2009) and type of outsourced task (Kirsch 2004). Table 3 provides an overview of the projects selected.

4.2 Data Collection

Similarly to Jain et al. (2011), we collected data retrospectively in two phases. Phase one lasted from September to October 2009 and phase two from July 2011 to January 2012. In both phases, interviews with various project stakeholders were held and supplementary documents were gathered. As control in IS outsourcing is mainly exercised by the client company, we primarily selected interviewees from BANK. In particular, we selected informants who were responsible for managing the partnership with the outsourcing vendor [i.e. senior managers (SM), project managers (PM), and application owners (AO)]. However, to capture not only the perspective of the controller but also of the controlee, we additionally interviewed managers from the vendors (VM). Interviews were based on a semi-structured interview guideline, took between 45 and 90 min, and were mostly conducted face-to-face. The document collection included contracts, operating level agreements (OLAs), service level agreements (SLAs), project plans and audit documentation. Table 4 provides an overview of the data collected.

Retrospective data collection allowed us to capture relevant changes in formal control specificity, and the preceding interaction processes between controls and the context, over several years while reducing the risk of data overload compared to continuous longitudinal data gathering (Leonard-Barton 1990; Poole et al. 2000). To alleviate the disadvantages of retrospective data collection, we applied two strategies (cf., Faems et al. 2008). First, cognitive bias and impression management was tackled by asking interviewees questions about particular events instead of their general view on the project. Second, to address respondent bias due to differences in the time lapse between the events, we triangulated the interview data with the documents. In case of discrepancies between subjective interview statements and objective documents, we contacted respondents to clarify them. Finally, we adopted a strategy used by prior research on control dynamics (Kirsch 2004); to be included in the analysis, data gleaned from one source had to be confirmed by another interviewee or document.

Table 3 Case descriptions

	"Troubled" cases		"Smooth" cases	
	CANDIDATE[123]	HIGHPOT[123]	ALUMNI[123]	PAYSLIP[123]
Similar case characteristics	Each selected case is *similar in size* (i.e., it ranges from 0.5 to 1.5 million US dollars *per year*), uses the *same software development* methodology (a slightly adapted waterfall model), and mainly consists *of software application services*			
Client	Big, globally acting German bank. All projects stem from the HR department			
Vendor	The initial vendor (UK) was taken over by its competitor (USA) during the project	Vendor located in the USA	Vendor located in the UK	Vendor located in the USA with a material branch in India
Place of delivery and management	Project carried out by people in the US, UK, India and Germany. Solution was planned to be rolled out worldwide	Project carried out by people in the US, UK and Germany. Solution rolled out worldwide	Project carried out by people in the US, UK and Germany. Solution rolled out worldwide	Project carried out by people in Singapore and India. PAYSLIP processing only for the Indian branch of BANK
Project duration	The project started in 2006	The project started in 2009	The project started in 2001	The project started in 2008
Focus of investigation	2006–2011	2009–2011	2006–2011	2008–2011
Project focus during time of investigation	Customization of a new tool to replace ALUMNI	Customization of a new tool to support BANK's global skill development and performance assessment processes	Switch from individually developed software solution to a standardized platform (2007)	Transfer from the previous payroll processing provider to ALPHA
Primary project goal	Maintainability	Maintainability	Effectiveness	First timeliness, then effectiveness

4.3 Data Analysis

We followed an iterative four-stage process of data analysis and theory building (cf., Faems et al. 2008; Jain et al. 2011).

Stage 1—Understanding the Case Story. Our first analysis was based on interviews with higher-level managers. They provided us with initial information about the purpose of each project in terms of high-level project goals, as well as each project's organizational and technological context. Then, we

Table 4 Interviews and documents

	Interviews in phase 1	Interviews in phase 2	Total number of interviews		Main documents
CANDIDATE	Client: 4	Client: 1	Client[a]:	5	Contract incl. all four schedules, OLA, other project documentation
	Vendor: 1	Vendor: 0	Vendor[b]:	1	
			Total:	**6**	
HIGHPOT	Client: 2	Client: 6	Client[a]:	8	Contract incl. all 13 schedules, OLA, other project documentation
	Vendor: 1	Vendor: 0	Vendor[b]:	1	
			Total:	**9**	
ALUMNI	Client: 3	Client: 3	Client[a]:	6	Contract incl. all schedules, OLA, other project documentation
	Vendor: 1	Vendor: 0	Vendor[b]:	1	
			Total:	**7**	
PAYSLIP	Client: 5	Client: 2	Client[a]:	7	Contract incl. all eight schedules, OLA, other project documentation
	Vendor: 1	Vendor: 1	Vendor[b]:	2	
			Total:	**9**	
Cross-project	Client: 2	Client: 3	**Total**[c]:	**5**	OLA template, other project documentation
			Sum	**36**	

[a] For each case we interviewed at least one SM, PM and AO to represent the client view
[b] For each case we interviewed at least one VM to represent the vendor view
[c] To gain insight into the organizational and technological context of each case we interviewed three additional senior managers with overview over all four IS outsourcing projects

conducted semi-structured interviews with the PM of each project to understand the project history. Hence, at the end of this stage we had a basic understanding of the chronological flow of events, which we documented in a graphical timeline and a first case write-up.

Stage 2—Narrowing Down Control Changes. The second stage of analysis was based on interviews with additional key informants who described the chronology of control changes. Then we asked further questions on how and why controls were specified over time, and on the role of contextual influences in this process. During this stage, both the documents and the graphical timeline for each project helped us to verify the consistency of these subjective accounts and to gather a more detailed picture of the case history. Next, we summarized this information in case-study reports (second write-up) that were still close to the data. Finally, to further improve external validity (Yin 2009), we conducted a feedback presentation with the BANK managers who had been interviewed at the first stage of this research endeavor. Hence, at the end of the second stage we had a detailed and verified understanding of the reasons for, and consequences of, control changes within each case.

Stage 3—Analyzing Translation Episodes. In this stage, we analyzed the data using NVIVO 9.2. To structure our analysis we related each piece of evidence to the elements of our research framework. First (a) we elicited for each case which

of the four high-level project goals was the most important one (primary high-level project goal). Then (b) we analyzed the translation process of high-level goals into more specific formal controls by identifying those text passages in the interview transcripts and documents that reflected changes in controls (Miles and Huberman 1994). For each of these changes, we (c) analyzed whether it was linked to a related change in the stakeholder or the task context to unveil interactions between controls and the context. Then, we (d) examined whether those interactions led to more specific formal controls, and in a final step (e) the consequences of the exercise of those controls for the achievement of high-level project goals were analyzed. Hence, at the end of the third stage we had identified for each case the primary initial high-level project goal, a number of translation episodes, and the consequences of the exercise of the emerging, more specific controls for the achievement of primary high-level project goal. The next chapter (Within-Case Analysis) describes the result of this third analysis step.

Stage 4—Developing a Process Model. During this stage we moved from the episodes-level via the cross-episodes and the case-level to the cross-case-level. First, we ordered the translation episodes chronologically and sought to identify connections between them. This allowed us to construct process models of the translation process of high-level project goals into tangibly measurable outcomes and behaviors for each individual case. Then, we compared those models and the individual episodes across the four cases to uncover recurring patterns. In doing so, we sought to identify similarities and differences with regards to translation processes, the emergent specific formal controls and the subsequent achievement of goals. This phase of constantly comparing (Corbin and Strauss 1990) and integrating findings from the individual cases allowed us to arrive at our final process model.

5 Results

In this section we present the results of our multiple-case study. In each case, we uncovered several translation episodes. These allowed us to identify different processes of how high-level project goals are translated into more specific formal controls (cp. Figs. 2, 3, 4 and 5). Each case starts with a brief introduction outlining the primary high-level project goal of each case. This primary high-level project goal is used as a reference point to assess whether the exercise of emerging controls with higher specificity was conducive for the achievement of this goal. Next the translation episodes are described, presenting evidence for control-context-interactions, and for the emergence of controls with higher specificity.

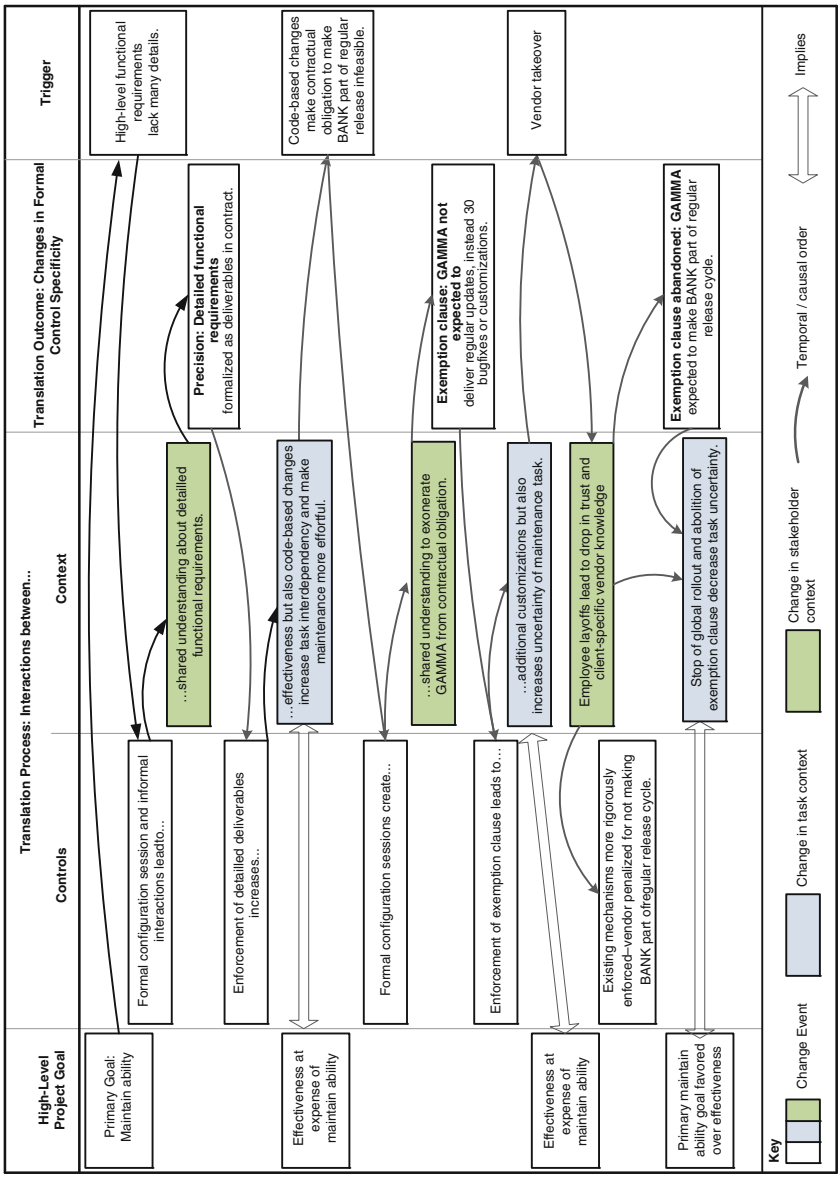


Fig. 2 Control-context-adaptations at CANDIDATE

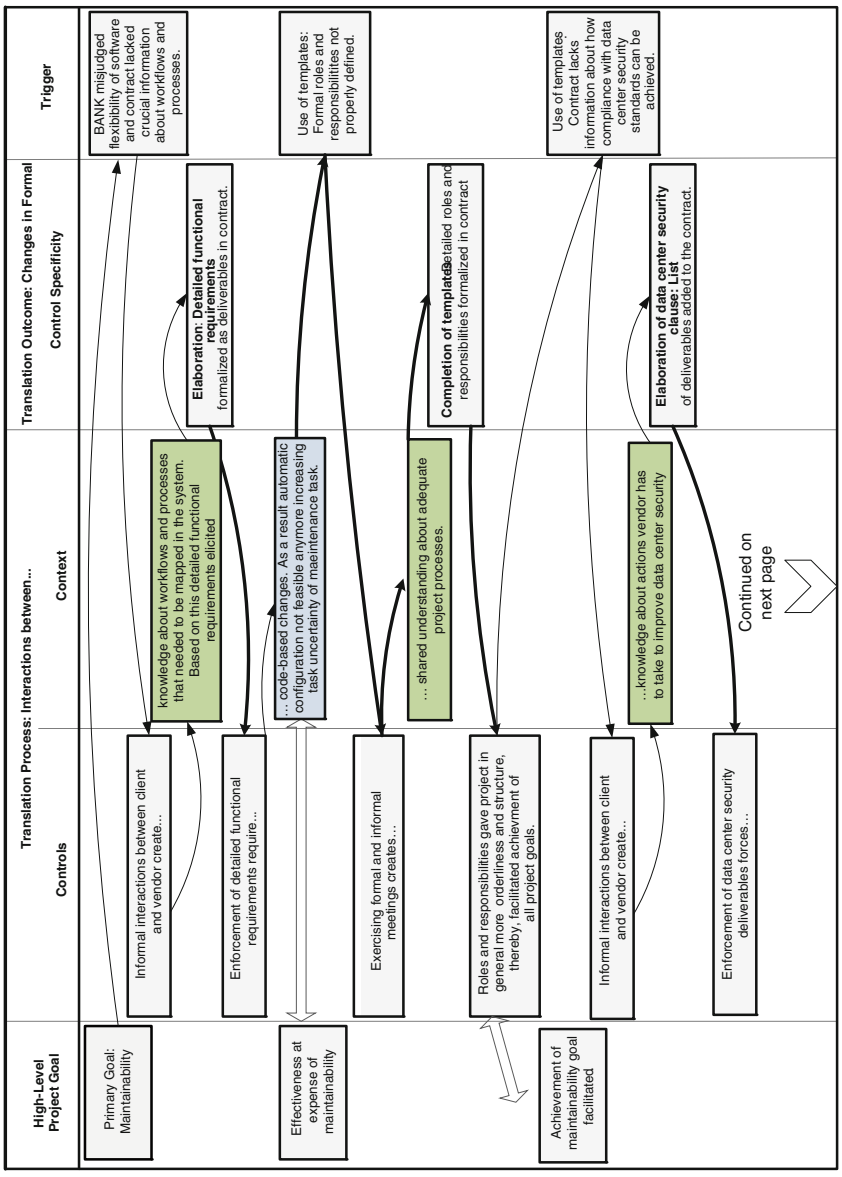


Fig. 3 Control-context-adaptations at HIGHPOT

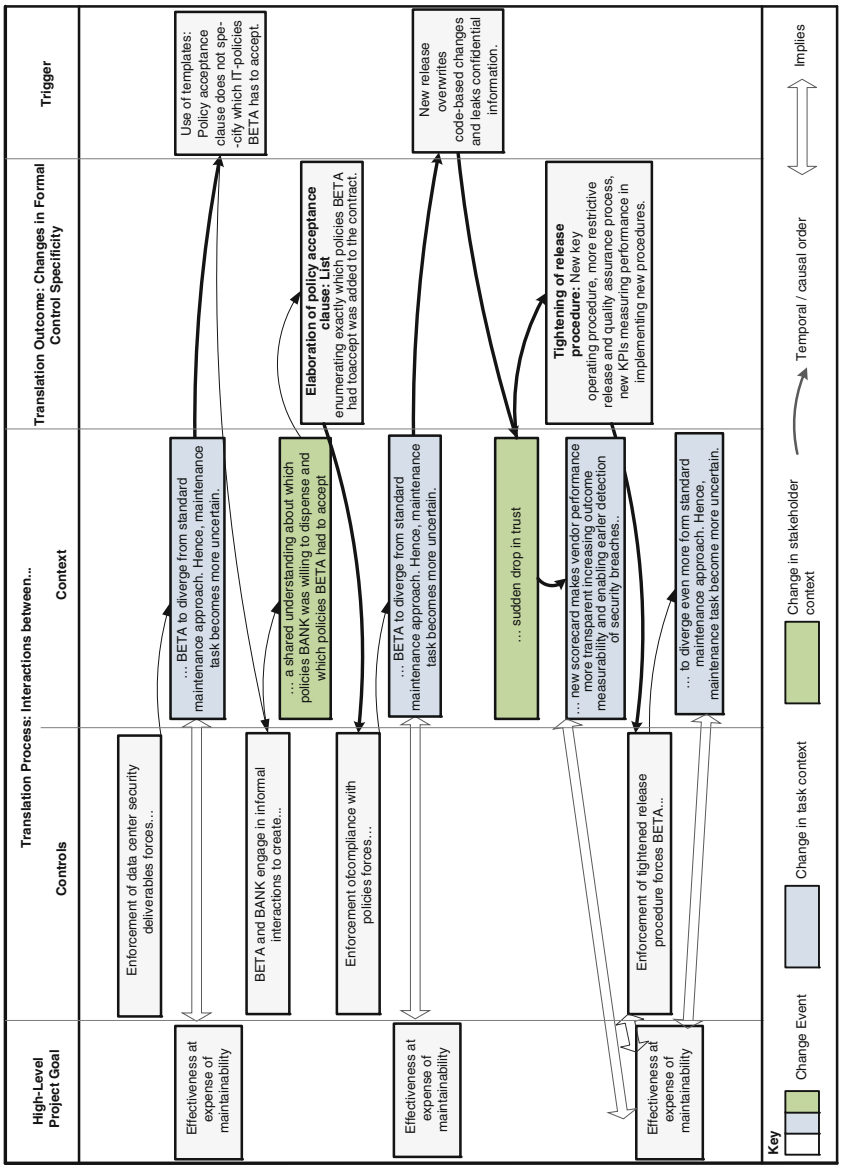


Fig. 3 (continued)

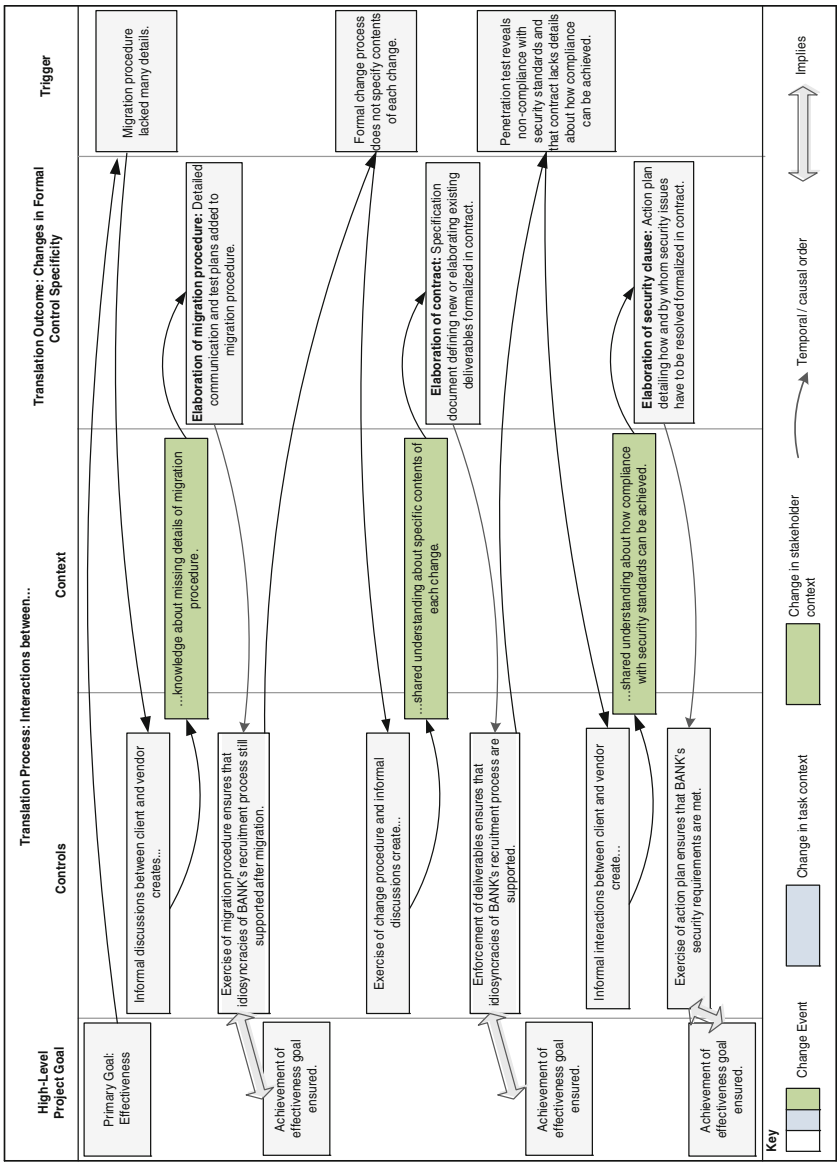


Fig. 4 Control-context-adaptations at ALUMNI

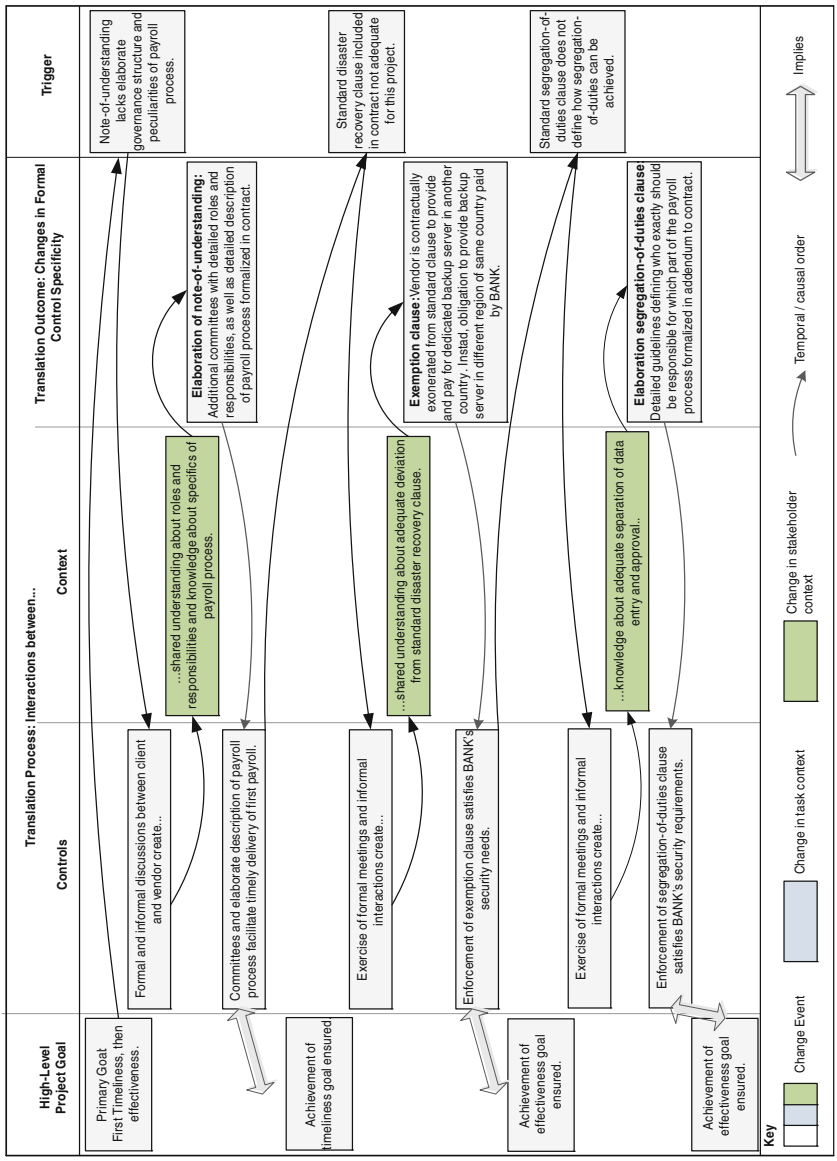


Fig. 5 Control-context-adaptations at PAYSLIP

5.1 Within-Case Analysis

5.1.1 The Translation Process at CANDIDATE

In 2006, BANK purchased GAMMA's software solution to support its recruitment process. The outsourcing included the provision of the software package, customization, software maintenance, and application hosting. The new software should provide BANK with basically the same functionality as the "home-brewed" solution before but at lower maintenance cost. Thus, *the main objective of this outsourcing arrangement was to lower the long-term maintenance cost* in comparison to the previously dispersed IS application environment built around the recruitment process. Therefore, the initial plan was to merely parameterize instead of intensively customize GAMMA's solution.

Episode 1. When the project started, the parties had only elicited the desired high-level functional requirements. The contract, consequently, lacked detailed functional requirements needed to customize the software to the peculiarities of BANK's recruitment process. To further specify those requirements, the parties relied on both formal configuration workshops (SM) as well as intense informal information exchange between the future users of the software and GAMMA. The exercise of both formal configuration sessions and informal knowledge exchange created a shared understanding (stakeholder context) between the parties about the huge variety of functional requirements that needed to be implemented to satisfy BANK's business needs. When those detailed functional requirements were subsequently formalized as deliverables in the contract, they specified the already included high-level requirements that the vendor was expected to achieve (increase in formal control specificity). However, when BANK started to enforce those specific deliverables by exercising those more specific controls, GAMMA's developers saw only one option to fulfill them, i.e. they not only customized the system through parameterization, as is common practice, but through code-based changes:

> [The software] is difficult to customize. You can customize [via parameterization] but it is complicated (PM).
>
> GAMMA had changed the codebase [of BANK's software instance] an awful lot… in case of the complicated DB requirements it was more likely to be customized rather than configured. (PM)

Those code-based changes, however, had an unintended side-effect—they made the maintenance task performed by the vendor more interdependent on DB. In particular, the automatic processing of data received by BANK was not feasible anymore. Instead, to properly process data from BANK's HR-systems, GAMMA needed to "manually transform the data" (PM), and subsequently BANK had to approve those transformations (increase in task interdependency). Hence, while those code-based changes helped to satisfy the effectiveness objectives of the project ("it was brilliant" (AO)), it also made maintenance more costly and time-consuming.

Q: So it must be pretty hard to maintain the old software I guess? #00:24:49-0#
A: Exactly. Particularly now [after the customizations]. [VM]

Thus, the primary maintainability goal was put at risk in favor of the subordinate effectiveness goal.

Episode 2. Those code-based changes became even more problematic when the solution went live in Germany, India, the US and the UK. While the vendor was contractually obliged to make BANK participate in the regular release cycle, the parties soon realized that the code-based changes had accidentally accumulated to the degree to which new releases of the standard software could not be deployed to BANK anymore; BANK's software instance was simply too different from the standard.

Such SaaS software has upgrades, in fact, those updates come quite often. Then, GAMMA came and said: You cannot have the normal upgrades anymore, since to deploy an update, we would have to go through the whole technic cycle in order to make that work for you (PM).

BANK realized that forcing GAMMA to achieve the contractually defined outcome of making BANK participate in the regular release cycle was not an option since the dropout from the regular release cycle was both parties' fault:

We have forced GAMMA to [make the code-base changes]—but unfortunately GAMMA allowed that. They should have said "No" (PM).

To cope with this problem the parties decided to adapt controls. In a formal meeting between both parties, GAMMA and BANK came to the shared understanding (stakeholder context) that GAMMA should be exonerated from its contractual obligation to make BANK part of the regular release cycle if in return GAMMA would compensate BANK. In particular this was done by agreeing on a new exemption clause: GAMMA would be obliged to implement 30 minor bug fixes or additional customizations whenever GAMMA provided its other customers with a new release. This new exemption clause was tailored to solve the specific problems arising with each new release and became the basis for evaluating vendor's maintenance performance (increase in formal control specificity). Moreover, the new exemption clause with the explicit option to demand additional customizations from GAMMA made sure that BANK's specific end-user requirements were satisfied, i.e. it ensured that BANK's effectiveness goals were met. However, when BANK started to enforce the exemption clause by demanding additional customizations, it gave rise to an unintended side-effect: BANK's software instance *moved farther and farther away from the standard*, i.e. the maintenance task became more uncertain (increase in task uncertainty) which made future updates even more complicated. Thus, the initial maintainability goal was sacrificed to achieve higher effectiveness:

As soon as we were just trying to run it and trying to fix issues on a day-to-day basis, that was when it got worse. (AO)

Episode 3. Despite increasing dissatisfaction with the effortful maintenance of GAMMA's software, BANK and GAMMA seemed to have stuck with the situation

until the end of 2008, when GAMMA was taken over by DELTA—the company BANK specifically opted against in the vendor selection process. This takeover was accompanied by drastic employee layoffs and DELTA's announcement that it would stop using GAMMA's software in favor of DELTA's own solution in two years; BANK had aimed to use this software for many more years. With the drastic employee layoff, not only a lot of BANK-specific client knowledge got lost, also the trusted relationship *went down like hell* (PM) (change in stakeholder context). This event led BANK to finally address the root cause(s) of their dissatisfaction with GAMMA's software. In particular, two measures were taken: First, controls were adapted considerably. For instance, BANK intensified the use of existing formal procedures (tightened the thumbscrews (PM)), i.e. BANK started to insist that the problems with regular releases would be considered failures to fulfill contractual obligations and therefore reduced the payment, and most importantly, BANK introduced a new *build process* that approximated BANK's standard build process (decrease in formal control specificity). This new process did not allow for further customizations. This ensured that maintenance would not become ever more uncertain and replaced the former agreement which allowed BANK to select 30 items from a list of total items and customizations. Second, BANK changed the task context by immediately stopping the global rollout of the GAMMA application—this ensured that the maintenance task would not grow even more complex since through this measure less idiosyncratic requirements had to be fulfilled. Hence, the change of controls and the task ensured that the drift towards a higher degree of customization and ever more effortful maintenance was stopped, i.e. the changes helped to better achieve the maintainability goal. Figure 2 depicts and summarizes the control-context-adaptations observed at CANDIDATE.

5.1.2 The Translation Process at HIGHPOT

In 2009, BANK decided to manage the skill and performance evaluation of their employees with BETA's web-based SaaS solution. *The major objective of this outsourcing arrangement was to standardize skill and performance evaluation across all national companies to lower the long-term maintenance cost* since skill and performance evaluation was seen as "non-strategic" (PM) and therefore cost considerations were prominent. Accordingly, the initial plan was to customize BETA's solution merely through parameterization. Since BANK used contractual documents from previous SaaS partnerships as templates, the project started with a number of rather general formal controls, while the adaptation of these controls to the project specifics started once the project was kicked-off.

Episode 1. Shortly after the kick-off, the project was faced with early challenges when it turned out that BANK had misjudged the flexibility of the vendor application. In particular, BANK erroneously believed that BETA's solution would support role-based access privileges. This was problematic since BANK demanded an idiosyncratic feature—the "superior view" (AO)—that required role-based access privileges. This feature was to allow superiors to document their "true"

opinion about a given employee that would be concealed from that employee. While this feature was a contractually defined outcome that BETA was expected to deliver, the respective contract clause was missing crucial information about the specific workflows and processes that needed to be mapped in BETA's software in order to adequately implement it. Those missing pieces of information were the reason why also BETA did not realize that without role-based access privileges an implementation of this feature was not possible through mere parameterization.

To overcome this problem, the project team members of BETA and BANK started to extensively share knowledge informally. Through this informal knowledge sharing client and vendor jointly created the knowledge that was missing before (stakeholder context), i.e. BANK's processes and workflows that needed to be mapped were in a first step rigorously documented, then in a second step, used to elicit the detailed functional requirements that were needed to properly implement the "superior view". Those detailed functional requirements even involved code-based changes. Then, the client capitalized on this increased knowledge by elaborating the respective contractual clause with those detailed functional requirements that BETA was expected to deliver (increase in control specificity). However, once BETA started to implement those detailed functional requirements in order to meet BANK's performance expectations, they had to change the code-base of the software. This had the unintended side-effect that maintenance of the software became less standardized since for those parts of the software that had been changed on a code-basis, automatic configuration through parameterization was not feasible anymore, instead, it required manual "by hand measures" (PM) (increase in task uncertainty). Thus, while this change in controls helped to satisfy the effectiveness objectives of the project, it made maintenance more costly and time-consuming. Thus, the achievement of the primary maintainability goal was put at risk in favor of the subordinate effectiveness goal.

Episode 2. Subsequently, the focus was set on transforming the above mentioned "templates" such that control would fit the project specifics. This involved designing controls for those parts of the project that were already in delivery mode, but also for the still-important configuration aspects. This took place in three consecutive steps. First, BANK and BETA addressed the problem that in the contract formal roles and their responsibilities were not yet properly defined. This was addressed through exercising formal and informal meetings between BANK and BETA. In those formal and informal meetings BANK and BETA were able to exactly specify which organizational roles would be needed, which specific persons should be assigned to these roles, and which role should be assigned to which specific committee. Thus, the client and the vendor actively created a shared understanding about adequate project processes (stakeholder context). Once the parties had reached this point, they completed the missing sections of the above mentioned template by formalizing those roles and relationships. Thus, BANK elaborated the organizational roles and responsibilities that are the basis of formal control (increase in formal control specificity). This gave the project in general "more orderliness and structure" (AO), which was perceived as helpful in achieving all project goals in parallel.

Episode 3. This was not the case for the second adaptation of controls; when it turned out that BETA was not compliant with BANK's data center security standards. BETA was contractually obliged to be compliant with this standard, however, the contract was missing the details of how exactly this could be achieved. To specify the respective clause, the parties engaged in a rather informal knowledge exchange (informal control). In this process BANK acquired the specific technical knowledge to solve this problem (stakeholder context). In particular a list of very specific measures to improve data center security (e.g. the exact location of a camera to track each person entering and leaving the datacenter and eligibility criteria for employees maintaining BANK's software) was elicited. This list of defined deliverables that BETA was expected to achieve was then added to the contract to elaborate the already existing policy acceptance clause (increase in formal control specificity). While this specification of controls served the purpose to better achieve BANK's desired end-user functionality (effectiveness objective), it also changed the underlying maintenance task since BETA had to diverge from its standard maintenance approach (task uncertainty increases). For instance, BETA had to specifically define who of their maintenance staff would be allowed to enter the data center and who not, while the standard approach was that all employees were allowed to enter the data center. Thus, the initial maintainability goal was sacrificed for a gain in effectiveness.

Episode 4. The third specification of the control templates started when it turned out that BETA's solution was not compliant with all of BANK's group-wide IT policies. Yet, in the contract, the relevant policy acceptance clause had been deliberately left open, since BANK knew how challenging it was for SaaS vendors to comply with all policies. To elicit which of BANK's security procedures BETA had to follow and which security deliverables BETA had to reach, the parties engaged in informal negotiations. In this process the parties actively created a shared understanding (stakeholder context) about which policies BETA had to accept and which policies BANK was willing to dispense. Subsequently, the policy acceptance clause was elaborated accordingly, i.e. a list enumerating the specific policies BETA had to comply with became an addendum to the contract (increase in formal control specificity). Again, while this specification of controls served the purpose of effectiveness (BANK's security requirements were satisfied), it also made the maintenance task for BETA even less standardized than before since BETA had to diverge from its standard maintenance approach to comply with the new policy clause (task uncertainty increases). This made maintenance of BETA's solution more effortful, thus, maintainability was again sacrificed for a gain in effectiveness.

Episode 5. While the cumulated incremental control-context-adaptations described above had led to a number of highly specific formal controls, those adaptations also entailed repeated changes in the task-context. In particular, it made the maintenance task less standardized and thus more uncertain. This caused *a tremendous problem* (AO) when BETA published a new release that overwrote a number of code-based, BANK-specific customizations in August 2011. Most importantly, the *superior's view* mentioned above was deleted and, thus, employees had *access to* [*confidential and hidden*] *comments of their superiors*

(AO) on their performance. When BANK realized this, BETA had to shut down the solution, resulting in five weeks of unscheduled downtime. This strong event produced a sudden drop in *our ability to trust the system or* [*BETA's ability*] *to keep the system running* (PM) and led BANK to disruptively introduce a number of controls to ensure that future releases would not cause similar problems. First, BANK significantly tightened the release procedure BETA had to follow by introducing a new "key operating procedure" that obliged BETA to follow a significantly more restrictive release process that forbids BETA to publish a new release without having tested it on a new BANK test platform and without approval of BANK employees (*4-eye-process to ensure 100 % correct deployment to production*) (PM). Second, BANK was upgraded to BETA's "critical account program" that incorporates a stricter "quality assurance process", a "new deployment process" and new, demanding service levels that measured BETA's performance in implementing the new release implementation procedures. Thus, BANK prescribed in much more detail which steps BETA had to take when new releases were published, and in addition, started to measure BETA's performance in implementing these specific procedures (increase in control specificity).

While those measures were directly linked to the resolution of the immediate release problem, BANK additionally changed its controls in ways that were not directly linked to the actual release problem but rather to the underlying problem, i.e. the maintenance task had evolved toward a higher degree of uncertainty. Therefore, BANK developed a scorecard that required BETA to make their performance in a number of outcome dimensions, like *policy compliance* and *time-to-market* more transparent, i.e. BANK actively changed the context factor outcome measurability. While this change did not solve the underlying problem directly (i.e. maintenance task has become more uncertain), it enabled BANK to more quickly respond to future problems since they would be detected earlier.

After these turbulent changes, the measures taken proved effective [*it has improved* (PM)]. In particular, the considerably changed controls ensured that future software updates would not cause further security breaches despite BANK's idiosyncratic adaptations of the software. However, the problems' root cause was not addressed, instead, the underlying maintenance task became even more complex since now BETA had to follow a highly-customer specific release procedure (increase in task uncertainty). Thus, on the one hand the significantly tightened release procedure, as well as the deliberate adaptation of outcome measurability helped BANK to ensure that updates of the system would not cause severe downtimes anymore, i.e. the measures taken helped to achieve the effectiveness objective. On the other hand, the tightened release procedure forced BETA to further deviate from its standard maintenance approach, i.e. it put the primary maintainability goal at risk. Thus, maintainability was again sacrificed for a gain in effectiveness. Figure 3 depicts and summarizes the control-context-adaptations observed at HIGHPOT.

5.1.3 The Translation Process at ALUMNI

In 2000, BANK purchased a software package provided by EPSILON to automatize the manual global graduate recruiting process. While BANK expected substantial cost savings through the process automatization, the primary IS project goal was that the solution would support BANK's recruiting idiosyncrasies (effectiveness objective). Accordingly, EPSILON, a relatively small start-up company, attracted BANK as one of its first large customers. EPSILON re-engineered its solution fundamentally to comply with BANK's business processes.

Episode 1. About six years after the initial re-engineering of the software, EPSILON decided to sell the software, originally developed for the individual demands of BANK, to other customers as well. This required EPSILON to "platformize" the software, i.e. to separate reusable core components from customer-specific components. To guarantee future system updates, BANK's instance of the system also had to be migrated to this new platform in 2007. From BANKS's perspective, however, the migration procedure lacked many details:

> …you know, in our environment we would expect a whole business plan, communications plan and then details [about] the testing session…we spoke about it but they didńt [pull together an adequate migration procedure]. (AO)

To specify the migration procedure BANK heavily relied on informal discussions and phone calls. In this process BANK and BETA actively created the knowledge needed for this specification (stakeholder context):

> …we have to be very very prescriptive about what we want because they [the vendor] dońt think of operating in such a global environment…so often we are teaching them around how you get things down and [the migration procedure] is a classic example… [We] actually pulled all that together but the benefit of that is that then we drive…and we could tell them exactly how and what we wanted. (AO)

In a next step, BANK capitalized on the informally gathered knowledge by elaborating the formal migration procedure (increase in control specificity). This involved, first, a detailed communication plan specifying exactly who at BANK had to be informed about which migration activities, and second an elaborate test plan specifying test methods and establishing pass/fail criteria for those tests (increase in control specificity). The subsequent exercise of the migration procedure made sure that BANK's idiosyncratic recruitment process was still and without the need for manual adjustments supported—even after the migration to the new platform. Thus, it helped to achieve the primary effectiveness goal.

Episode 2. Earlier in the project the new central vendor management of BANK had introduced a change procedure specifying how changes requested by BANK had to be formally processed. Naturally, the specific contents of each change were not known. Whenever the change process was exercised, the parties typically performed the formal project steps of the change process, however, to further clarify the contents of each change, the parties heavily relied on spontaneous informal control (informal control):

> What usually happens—we have procedures that we go through but often DB might ask us they have a query, they have something that need to be fixed and they will contact me and we have kind of an informal discussion about what we want. (VM)

Once client and vendor had created a shared understanding in those formal and informal discussions (stakeholder context), this shared understanding is used to specify the respective formal controls:

> At this stage…it basically is for me to write up a…specification putting everything together… the implications for the systems, spec out the whole process… [Then] we kind of send it back and forth to make sure it is approved. (VM)

Once such a specification document was approved, it became an addendum to the contract defining new or elaborating existing deliverables for EPSILON (increase in formal control specificity). For example:

> … because of the new recruiting season there are some things to be done like the drop-downs have to be updated, we need to change the application form and like that.

Changes like this made sure that the changing idiosyncrasies of BANK's recruitment process were always adequately mapped in the system such that it always effectively supported BANK's recruitment process. Thus, they ensured that the primary effectiveness goal was ensured.

Episode 3. The last specification of formal control was triggered when BANK simulated an attack on EPSILON's system (penetration test) to monitor whether EPSILON's software had security loopholes. EPSILON was contractually obliged to comply with certain security standards. The simulated attack, however, revealed a number of security loopholes:

> When we did the penetration test, we gave the attackers some information and they tried to break into the system…and they succeeded. A couple of hours after the penetration test started, one of the attackers called us and said that he would control the system console now. (PM)

To ensure that EPSILON would comply with BANK's security standards in the future, the parties aimed at elaborating the contract's security clause to include specific guidelines, *how these problems should be resolved* (PM). For that purpose, client and vendor started to informally interact. In this process the parties created a shared understanding (stakeholder context) on how compliance with BANK's security standards can be achieved. This was formalized in an *action plan* (PM) that elaborated the already existing security clause by exactly specifying how and by whom security issues had to be resolved (increase in formal control specificity). When subsequently exercised, this made sure that BANK's specific security requirements were met (achievement of effectiveness goal ensured). Thus, it helped to achieve the primary effectiveness goal. Figure 4 depicts and summarizes the control-context-adaptations observed at ALUMNI.

5.1.4 The Translation Process at PAYSLIP

In 2008, BANK mandated ALPHA to take over the PAYSLIP processing for their Indian branch at the earliest possible date. The reason for this urgency was that BANK's previous Indian payroll vendor, PRE-ALPHA, had been convicted of embezzling the payments of several customers. As BANK had outsourced its Indian payroll already for several years, they were not able to process it single-handedly. Therefore, timeliness was the primary objective in the early project phases; only after this goal was fulfilled did the implementation of more idiosyncratic features come to the fore:

> We had two goals. The payroll had to be running. This works even without segregation of duties, etc. Therefore, all those security issues were initially given a low priority… later we took care of them. (PM)

Episode 1: Due to the rapid switch from one vendor to the other, the outsourcing relationship started with a note-of-understanding as the sole contractual basis. This note-of-understanding only defined one governance committee in contrast to an elaborate governance structure, and only obliged BETA to support BANK's payroll process, however, the subtleties of this payroll process remained unclear. In particular, the specific steps ALPHA had to follow to adequately process the payroll remained unclear:

> [The Indian payroll] is not only about salary statements. They [Indian employees] also have a diversity of benefit systems. For instance, they can reimburse the cost for drugs via the payroll. It is a cafeteria model that had to be captured in the process. (PM)

In order to further specify the payroll process and the governance structure the parties conducted both formal meetings and informal discussions between functional experts:

> [The] functional experts talked to the other functional experts on the other side who understood their needs better…They used to more or less talk to each other every day or every other day in this initial phases. (VM)

In this process the parties jointly created a shared understanding about adequate roles and responsibilities needed to manage the project, as well as formerly missing knowledge about the specifics of the payroll process (stakeholder context). In a next step, BANK capitalized on this increased knowledge and shared understanding by first defining a more specific governance structure for the project with additional committees and detailed roles responsibilities, and second by documenting an elaborate description of the payroll process (increase in formal control specificity). Both became part of the first contract between BANK and ALPHA. These changes of controls helped BANK to make sure that ALPHA was able to deliver its first payroll on time in summer 2009, i.e. it helped the parties to satisfy the timeliness objective.

Episode 2. After the payroll processing went operational, BANK started to pay attention to ensure that its idiosyncratic security needs would be fulfilled. Due to the *project's hectic nature* (PM) at the beginning of the project, the parties had

only included a rather general security policy acceptance clause in the initial note-of-understanding.

> At that time…the contract needed to be reformulated to fulfill our policies. This touched on issues like Disaster Recovery and Segregation of Duties. (PM)

Episode 2a. For Disaster Recovery it turned out that BANK's generic security policy was not feasible in that specific case. In particular, the general security policy required a vendor to operate a dedicated backup server in another country. This was not reasonable since…

> …the costs for a dedicated backup server are as high as the yearly fee [that ALPHA received from BANK]…and in addition the neighboring country of India is [the politically unstable country] Pakistan. Moreover, you can easily put great distances between two servers within India. (PM)

To find a more adequate Disaster Recovery rule, the parties exercised both informal control ["spontaneous mail or phone calls" (VM)] and formal control meetings. In this process the parties created a shared understanding about how to adequately deviate from the standard disaster recovery clause (stakeholder context). The parties came up with the following solution:

> Then we kind of gave a detailed explanation and then finally BANK agreed to supply a dedicated server and dedicated backup tapes to us while we initiated a dedicated backup environment for BANK [at one of our Indian sites]. (VM)

This solution was formalized as an exemption clause in the contract, i.e. the vendor was contractually exonerated to provide and pay for a dedicated backup server operated in a neighboring country, instead, the vendor was obliged to set up a backup server in a different region in India, while BANK would cover the acquisition cost for the server (increase in formal control specificity). This detailed regulation made sure that ALPHA subsequently was able to comply with BANK's Disaster Recovery needs. Thus, it ensured the achievement of the primary effectiveness goal.

Episode 2b. For Segregation of Duties the challenge was that the standard segregation-of-duties clause as it was part of the contract did not define how segregation-of-duties can be achieved:

> … to design the Operating model such that it met our requirements…For instance the clear separation between data entry and data approval…It was about making sure that the vendor really operationalizes the respective contractual clauses, that the vendor would really do what we demanded. (PM)

To find a more adequate Segregation of Duties rule, the parties exercised both informal control ["spontaneous mail or phone calls" (VM)] and formal control meetings. In this process the parties created the knowledge about how data entry and approval could be adequately separated (stakeholder context). Then, the parties capitalized on this knowledge by elaborating the Segregation of Duties clause in the contract through defining detailed guidelines about who exactly would be responsible for which part of the payroll process (increase in formal

control specificity). Those detailed regulations made sure that ALPHA subsequently was able to comply with BANK's security needs. Thus, it ensured the achievement of the primary effectiveness goal. Figure 5 depicts and summarizes the control-context-adaptations observed at PAYSLIP.

5.2 Cross-Case Analysis

The within-case analysis showed how high-level project goals are translated into more specific formal controls as well as the consequences of these changes in control for the achievement of high-level project goals. Using a cross-case analysis we next identified common patterns that explain the success or failure to achieve high-level goals as a result of unique process patterns. For this purpose, we examined whether there were any recurring patterns with regards to the adaptation of control and the context that explain whether or not high-level goals were achieved. Our analysis revealed three main patterns characterized by unique control adaptation processes. Table 5 clusters each of the episodes observed in the individual cases according to these patterns. Together those patterns form a process model of the translation from high-level goals into more specific outcomes and behaviors (cp. Fig. 6).

5.2.1 Pattern 1: Translation Process Leads to Better Achievement of the Primary High-Level Project Goal

The first pattern seen nearly exclusively at ALUMNI and PAYSLIP explains the achievement of the most important initial high-level goals as a consequence of, first, translating those high-level goals into tangibly measurable outcomes and behaviors, and then, using those more specific controls to formally evaluate whether the actions of the vendor are resulting in the desired forward progress of the project. Noteworthy, the translation process from those high-level project goals into measurable outcomes and behaviors happens in a process in which controls and context mutually shape each other through reciprocal interactions. In particular, typically client and vendor relied on (already existing) formal controls and/or informal control *to actively adapt the stakeholder but not the task context*. In particular, the exercise of formal and/or informal control, led either to a shared understanding between client and vendor or increased client knowledge about tangibly measurable outcomes or behaviors that were deemed to be conducive to achieve a given primary, high-level project goal. Once this was achieved, the client capitalized on this shared understanding or increased knowledge by formalizing it in more specific formal controls. Their subsequent exercise fostered achievement of the primary project goal.

Table 5 Three process patterns as observed across the cases

Episode	Adaptation of		Change in formal control specificity	Exercise of control conducive to achieve primary project goal?
	Stakeholder Context	Task context		
Pattern 1: translation process leads to better achievement of the primary high-level project goal				
HIGHPOT E2	Yes (increase in shared understanding)	No	Increase	Yes: achievement of maintainability goal facilitated
ALUMNI E1	Yes (increase in client knowledge)	No	Increase	Yes: achievement of effectiveness goal ensured
ALUMNI E2	Yes (increase in shared understanding)	No	Increase	Yes: achievement of effectiveness goal ensured
ALUMNI E3	Yes (increase in client knowledge)	No	increase	Yes: achievement of effectiveness goal ensured
PAYSLIP E1	Yes (increase in shared understanding and client knowledge)	No	Increase	Yes: achievement of timeliness goal ensured
PAYSLIP E2.1	Yes (increase in shared understanding and client knowledge)	No	Increase	Yes: achievement of effectiveness goal ensured
PAYSLIP E2.2	Yes (increase in shared understanding and client knowledge)	No	Increase	Yes: achievement of effectiveness goal ensured
Pattern 2: translation process leads to better achievement of a subordinate high-level project goal at the expense of the primary high-level project goal				
CANDIDATE E1	Yes (increase in shared understanding)	Yes (increase in task interdependency)	Increase	No: effectiveness at expense of maintainability
CANDIDATE E2	Yes (increase in shared understanding)	Yes (increase in task uncertainty)	Increase	No: effectiveness at expense of maintainability
HIGHPOT E1	Yes (increase in client knowledge)	Yes (increase in task uncertainty)	Increase	No: effectiveness at expense of maintainability

(continued)

Table 5 (continued)

Episode	Adaptation of		Change in formal control specificity	Exercise of control conducive to achieve primary project goal?
	Stakeholder Context	Task context		
HIGHPOT E3	Yes (increase in client knowledge)	Yes (increase in task uncertainty)	Increase	No: effectiveness at expense of maintainability
HIGHPOT E4	Yes (increase in shared understanding)	Yes (increase in task uncertainty)	Increase	No: effectiveness at expense of maintainability
Pattern 3: breaking or reinforcing the drift away from the primary high-level project goal				
CANDIDATE E3	Yes (drop in trust)	Yes (decrease in task uncertainty)	Decrease	Yes: achievement of maintainability goal ensured
HIGHPOT E5	Yes (drop in trust)	Yes (increase in outcome measurability and increase in task uncertainty)	Increase	No: effectiveness at expense of maintainability

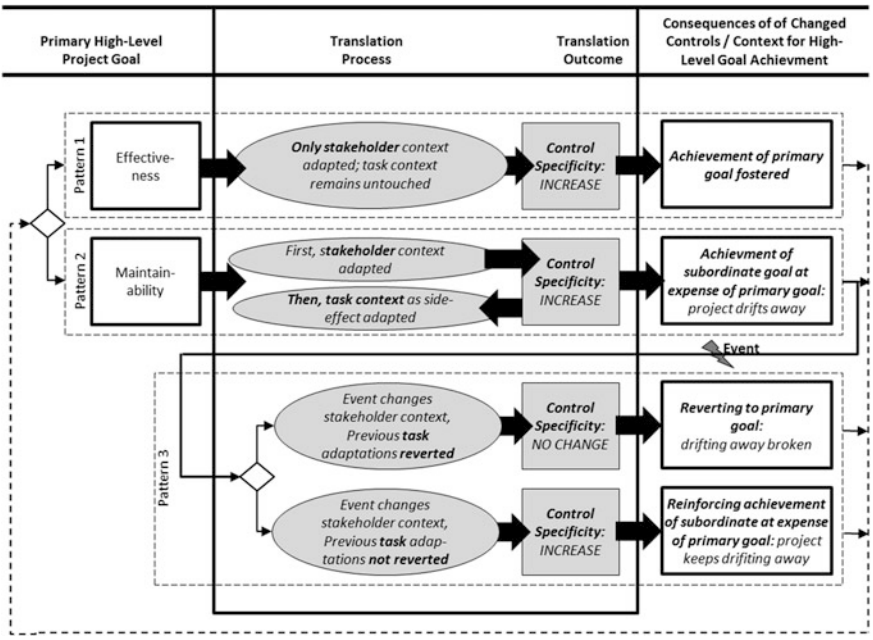


Fig. 6 Process model of translating high-level project goals into more specific outcomes and behaviors

5.2.2 Pattern 2: Translation Process Leads to Better Achievement of a Subordinate High-Level Project Goal at the Expense of the Primary High-Level Project Goal

The second pattern exclusively observed at CANDIDATE and HIGHPOT explains the failure to achieve the most important project goal (in both cases "maintainability") in favor of the achievement of some subordinate project goal as a consequence of a translation process in which *not only the stakeholder context but also the task context is adapted*. While in this process also more specific formal controls were designed, the exercise of those controls was not conducive to achieve the primary project goal. The reason for this seems to be rooted in the peculiarities of the translation process; similar to pattern 1, controls and context mutually shape each other, i.e. client and vendor relied on formal and informal control to actively adapt the stakeholder context such that a shared understanding and increased client knowledge was achieved that was then used to design more specific controls with tangibly measurable outcomes and behaviors. However, at pattern 2 these specifications typically mirrored idiosyncratic client needs such as specific requirements or processes that ran counter to the primary initial project goal of easy maintainability. Hence, when the client subsequently enforced those more specific controls, the vendor had to implement highly client-specific processes or requirements in order to comply with those new performance metrics. This had the unintended side-effect that the underlying maintenance task was also changed. Namely, the maintenance task became either more uncertain or its successful exercise required consideration of additional interdependencies, such that performing this maintenance became more costly and time-consuming. This unintended task change put the achievement of easy maintainability at risk.

Especially at CANDIDATE the repeated reciprocal adaptions of controls and the context seemed to unfold a self-perpetuating character, when a new rule was introduced that afforded BANK explicitly with the opportunity to tailor what was meant to be a standardized software service to its specific needs. Whenever this rule was exercised the maintenance task became even more complex and led the project to systematically drift away from its primary "maintainability" objective.

5.2.3 Pattern 3: Breaking or Reinforcing the Drift Away from the Primary High-Level Project Goal

The third pattern exclusively observed at CANDIDATE and HIGHPOT seemed to be linked to the previous drift away of those projects from the primary maintainability objective. At both cases strong events—a vendor takeover at CANDIDATE and the introduction of a "buggy" release at HIGHPOT—triggered substantial changes in control. In contrast, to pattern 1 and pattern 2, those changes were not primarily directed to translate high-level project goals into tangibly measurable outcomes and behaviors, instead, those changes were rather reactions to the triggering event. However, those reactions were quite different between the

cases. At HIGHPOT, the parties mainly concentrated on absorbing the sudden turbulences caused by the "buggy" release, i.e. the parties mainly concentrated on designing a rigorous set of controls (e.g. a new release process, a new quality assurance process, new KPIs, etc.) that allowed BANK to ensure that failures in future software releases would be earlier detected. In contrast, at CANDIDATE, the parties were not so much concerned with absorbing the distortions caused by the vendor takeover, instead, they addressed the root cause of the problem. This root cause was that the project had incrementally drifted away from its initial objective of easy maintainability through repeated adaptations of the maintenance task (cp. pattern 2). Therefore, BANK concentrated on making sure that the maintenance task would not become ever more complex by introducing a new process that inhibited further customizations and by immediately stopping the global rollout to ascertain that in the future no more additional country-specific requirements had to be considered. Thus, while the reaction at HIGHPOT aimed at early detection of problems, the reaction at CANDIDATE aimed at the prevention of problems.

5.3 A Process Model of Translating High-Level Project Goals into More Specific Outcomes and Behaviors

Together the three patterns form a process model in which the success or failure to achieve initial high-level project goals is explained through three unique process patterns. Figure 6 depicts this model and abstracts the major findings of this study. Accordingly, we find that the pursuit of more specific formal controls can have both positive and negative consequences for goal achievement—depending on the preceding translation process. If in the translation process actors exclusively adapt the stakeholder context but not the task context, then, they can design more specific controls which when exercised are conducive to achieve the primary high-level project goal (pattern 1). However, the design of such more specific controls can also bear negative consequences for the achievement of a primary high-level maintenance goal, if the consequent more specific controls motivate the vendor to implement client-specific outcomes (e.g. software functionalities) or processes (e.g. security guidelines). Their implementation may exert an unintended retroactive influence on the maintenance task such that this task may become more uncertain or exhibit additional interdependencies. In this case, the design and the subsequent exercise of more specific controls leads projects to incrementally drift away from the primary high-level maintainability goal (pattern 2). Such a drifting away can even unfold self-perpetuating dynamics when newly designed controls institutionalize client-specific changes that then entail further task changes and amplify the drifting away from the primary high-level project goal. This drifting away can be broken when strong events occur that channel the actors' awareness on the incrementally emerged gap between the primary project goal and realized

achievements (pattern 3). However, in order to effectively get out of this seemingly deadlocked situation, it is not enough to simply add additional specific controls (cp. HIGHPOT, E5), it rather requires the parties to reverse the preceding task adaptations (cp. CANDIDATE, E3).

6 Discussion

The goal of this study was to understand how high-level IS outsourcing project goals are translated into more specific controls, and how this translation process relates to the achievement of those goals. This question was motivated by the contradictory demands that managers in IS outsourcing relationships face when designing control mechanisms, i.e. on the one hand, the complex and dynamic nature of those arrangements makes the design of formal controls more difficult at the outset of those projects. On the other hand, the business-criticality of outsourced systems in combination with regulatory requirements makes formal controls more needed. An in-depth investigation of four IS outsourcing partnerships found that high-level project goals are incrementally translated into tangibly measurable outcomes and behaviors that are the basis of more specific controls. However, whether or not emerging formal controls with higher specificity are conducive to the achievement of the primary high-level project goal depends on the complex interplay between control and context adaptations. If managers exclusively adapt the stakeholder context, then, the emerging formal controls help to achieve the primary project goal (pattern 1). Yet, more specific controls may also systematically motivate vendor behavior that runs contrary to a high-level maintenance goal. In this case, the vendor's attempts to meet increasingly specific performance expectations materialize in unintended changes in the underlying maintenance task that make maintenance more costly and time-consuming. Such repeated control-context adaptations lead projects to incrementally drift away from the primary project goal. This drifting away can even unfold a self-perpetuating character (pattern 2). These self-dynamics are only broken after a strong event creates awareness of the problem. Yet, a sustainable solution seems to require more than introducing additional specific controls, it requires reverting preceding task changes (pattern 3).

The discovery of these process patterns provides rare empirical insight into how managers cope with the unique challenges that IS outsourcing relationships imposes upon them, and how those challenges can be overcome. Therefore, this study addresses the greater challenge of enabling and sustaining the success of IS outsourcing. While this has merit in its own right, our findings also bear important theoretical implications for control theory and IS project escalation literature.

6.1 Contribution to Control Theory

6.1.1 Adequate Translation Process is a Necessary Pre-Condition for is Outsourcing Success

Prior research in context of IS outsourcing was not able to empirically substantiate the link between the exercise of control and project success in terms of goal achievement. This raised the question why controls seemed to have positive performance implications in internal IS projects (Henderson and Lee 1992; Kavčič and Tannenbaum 1981; Kirsch and Cummings 1996; Tiwana and Keil 2009) but not in outsourced IS projects (Tiwana and Keil 2009). This study provides an empirically grounded explanation for this puzzling phenomenon: Before controls can unfold their positive performance implications, high-level project goals have to be incrementally translated into tangibly measurable outcomes and behavior. However, as shown by our results, the design and subsequent exercise of such specific formal controls are linked to goal achievement in a non-deterministic manner (Pettigrew 1990; Van de Ven and Poole 1995); while specific controls may have positive implications for goal achievement if in the translation process exclusively the stakeholder context is adapted, specific controls may also systematically motivate vendor behavior that is debilitating for the achievement of the primary high-level goal due to unintended consequent task changes. Thus, the failure of prior research to empirically substantiate the link between controls and goal achievement may be rooted in its lack to consider the preceding non-deterministic translation processes that serve as a necessary pre-condition for project success or failure.

6.1.2 Co-Evolutionary Dynamics Explain the Emergence of More Specific Formal Controls

Our findings also serve to extend control theory (Eisenhardt 1985; Kirsch 1996; Ouchi 1979). Control theory focuses on unidirectional, deterministic relationships between the context and controls. In particular, control theory argues that the context determines the choice of controls (Eisenhardt 1985; Ouchi 1979). This deterministic view seems to be incomplete. Our findings demonstrate that in the process of designing and exercising controls, actors not only adapt controls, they also incrementally adapt the stakeholder and/or the task context, and those context adaptations retroactively affect controls. Hence, controls and context are changed in response to one another, i.e. they are connected via reciprocal interactions and therefore co-evolve (Brown and Eisenhardt 1997; Thompson 1982, 2010; Tsoukas and Hatch 2001). Thus, our findings refine control theory's central assumption that the design of controls is determined by the context.

While the elucidation of this more complex view advances the theoretical understanding of the design and exercise of inter-organizational controls which has

merit in its own right, it also offers for the first time, an empirically-grounded process explanation for how and why controls with different degrees of specificity evolve. This extends control theory that has mainly explained the effective composition of control portfolios (Choudhury and Sabherwal 2003; Kirsch 1997b; Kirsch et al. 2002) or the amount of control (Gregory et al. 2013; Rustagi et al. 2008). Hence, this study offers a novel explanation for a design characteristic of controls that has not been captured by prior research—control specificity. The performance implications of the design and exercise of specific controls that have been demonstrated through our results and that are backed by a number of theoretical perspectives (Barney 1991; Locke and Latham 1994) underscore the importance of this theory extension.

6.2 Contribution to IS Project Escalation Literature

Prior research has asked the question why many IS projects seem to take a life of their own (Mayr 2002) and continue to bind resources despite the trouble they cause (Abdel-Hamid et al. 1999; Keil 1995; Keil et al. 2000; Lee et al. 2012). Answers to those questions were mainly rooted in psychological processes that explain biases in human decision making such as escalation of commitment to self-justify past behavior (Keil et al. 2000), the sunk-cost effect (Keil et al. 2000; Lee et al. 2012), or the completion effect (Keil et al. 2000; Lee et al. 2012). This study adds to this stream of literature by offering an additional explanation for this phenomenon that is rather rooted in work-level than in psychological processes. In all our cases, the high-level project goals were set by high-level managers. However, the translation of high-level project goals into measurable outcomes and behaviors was conducted by lower-level members of the project teams. According to the self-managed teams approach (Barker 1993) the proximity of such team members to the context and the idiosyncratic challenges of the operational level, enables those team members to more effectively act in "ways functional to the organization" (Barker 1993). As demonstrated by our findings, team members have, indeed, the ability to find specific solutions to specific problems, however, those solutions are not necessarily functional to the organization—they may actually sow the seed for new problems. At HIGHPOT and CANDIDATE, the exercise of emerged more specific controls led the projects to drift away from the high-level maintainability goal. The reason seemed to be that in contrast to what is assumed by the self-managed teams approach (Barker 1993), team members at HIGHPOT and CANDIDATE had not internalized the organization's high-level goals, i.e. they followed an effectiveness goals while a maintainability goal would have been functional to the organization. When those team members started to formalize the rules they developed, lower-level goals that ran counter to the initial high-level objectives became explicit components of the performance evaluation system. Naturally, the vendor strived for fulfilling those formal performance expectations which in turn made the maintenance task more uncertain and

effortful. This seemed to be the starting point of self-perpetuating dynamics; Team members that tried to cope with the consequent increased uncertainty, introduced additional specific controls that entailed further unintended task changes, etc. Thus, preceding incremental changes may have produced similar adaptations in a path-dependent manner (Leonardi 2011; Sydow et al. 2009). Hence, the complementary explanation for runaway projects that seem to take a life of their own that is offered by this study are self-perpetuating dynamics in the translation process that occur when team members that have not internalized high-level goals, formalize goals that stand in opposition to those goals.

6.3 Future Research

Future research may draw on our process view of the translation of high-level project goals into more specific formal controls to further refine our understanding of how controls should be designed in order to better achieve high-level project goals. A longitudinal event-time series study could test our process model, while bypassing the shortcomings of retrospective data collection (Poole et al. 2000). This could be achieved by transforming the different translation processes that we have observed into event chains. Then, the occurrence of different event chains could be used to predict the success or failure to achieve high-level project goals.

Another promising direction for future research would be to systematically incorporate contingency variables in the above mentioned event-time series study. In a first step, untested assumptions underlying this study could be empirically validated. For instance, two assumptions underlying this study were that in highly regulated industries, managers need to formalize more often, and that formalization is more difficult in case of complex and uncertain projects. While those assumptions are well-grounded in theory, future research may empirically substantiate them by testing whether the frequency of the occurrence of translation patterns systematically varies with the value of contingency variables. In a second step, such a study could quantify and thereby disentangle the contradictory demands that those contingencies impose on the translation process of high-level goals into measurable outcomes and behaviors.

6.4 Implications for Practice

For project managers that are faced with the challenge of translating high-level project goals into measurable outcomes and behaviors, it would be favorable to combine the benefits of these processes without suffering from associated risks. The benefits are that through the translation process, highly specific formal control mechanisms can be designed that are able to cope with the highly specific problems that may arise in the process of service delivery. The risks are that through

repeated and potential self-perpetuating task adaptions the project may detract from initial goals. Capitalizing on the benefits of translation processes while not suffering from the associated risks, may be achieved by deliberately advancing the exercise of formal and informal meetings in which client and vendor personnel create a shared understanding and gain access to "sticky" knowledge. In a next step, managers should take systematic measures to transform the gained knowledge and/or shared understanding into formal controls. However, to avoid those self-perpetuating interactions that guide the project away from its initial objective, senior management should carefully monitor this translation process to prevent projects drifting away from their goals. This can be achieved by especially inhibiting that in the translation process the task context is adapted. However, to avoid that self-perpetuating interactions guide the project away from its initial objective, senior management should at the same time carefully monitor whether in the process of designing more specific controls, client-specific outcomes or processes become explicit components of the performance evaluation system that run counter to a primary maintainability goal. If this is the case managers have to make sure that their implementation can be achieved through parameterization. If they require code-based changes the maintenance task may unintended become more costly and time-consuming.

6.5 Limitations

Like all studies this study is subject to limitations. First, we used data from one client company only. Although using multiple projects allows for some degree of generalization, we recognize the need for replication studies in other companies and industries to either discover additional translation processes or to confirm the findings of this study. Second, this study is based on two rounds of retrospective interviews. While this research design reduced the risk of data overload, it might also have given respondents the possibility to conceal valuable information. Therefore, future research should make use of participative research approaches where the researcher accompanies a project from start to finish (e.g., Avison et al. 1999; Baskerville and Wood-Harper 1996) to unravel additional subtleties of the translation process. Finally, we used initial high-level project goals as a reference point to assess whether or not control-context-adaptations were conducive for the achievement of this high-level goal. While the perceived success of a project mainly depends on whether or not such initial high-level project goals are achieved—even if those goals change (Lee et al. 2012; Linberg 1999)—the real economic success of a project might be realized just because parties change goals over the course of a project, if the new goals are more adequate. Hence, investigating the economic impact (DeLone and McLean 1992) of more specific controls for the organization may add further credence to future studies.

References

Abdel-Hamid, T. K., Sengupta, K., & Ronan, D. (1993). Software project control: An experimental investigation of judgment with fallible information. *IEEE Transactions on Software Engineering, 19*(6), 603–612.

Abdel-Hamid, T. K., Sengupta, K., & Swett, C. (1999). The impact of goals on software project management: An experimental investigation. *MIS Quarterly, 23*(4), 531–555.

Avison, D. E., Lau, F., Myers, M. D., & Nielsen, P. A. (1999). Action research. *Communications of the ACM, 42*(1), 94–97.

Banker, R. D., & Kemerer, C. F. (1992). Performance evaluation metrics for information systems development: A principal-agent model. *Information Systems Research, 3*(4), 379–400.

Barker, J. R. (1993). Tightening the iron cage: Concertive control in self-managing teams. *Administrative Science Quarterly, 38*(3), 408–437.

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*(1), 99–120.

Baskerville, R. L., & Wood-Harper, A. T. (1996). A critical perspective on action research as a method for information systems research. *Journal of Information Technology, 11*(3), 235–246.

Becker, M. C. (2004). Organizational routines: A review of the literature. *Industrial and Corporate Change, 13*(4), 643–678.

Benbasat, I., Goldstein, D. K., & Mead, M. (1987). The case research strategy in studies of information systems. *MIS Quarterly, 11*(3), 369–386.

Brown, S. L., & Eisenhardt, K. M. (1997). The art of continuous change: Linking complexity theory and time-paced evolution in relentlessly shifting organizations. *Administrative Science Quarterly, 24*(1), 1–34.

Cardinal, L. B. (2001). Technological innovation in the pharmaceutical industry: The use of organizational control in managing research and development. *Organization Science, 12*(1), 19–36.

Cardinal, L. B., Sitkin, S. B., & Long, C. P. (2004). Balancing and rebalancing in the creation and evolution of organizational control. *Organization Science, 15*(4), 411–431.

Cardinal, L. B., Sitkin, S. B., & Long, C. P. (2010). A configurational theory of control. In S. B. Sitkin, L. B. Cardinal, & K. M. Bijlsma-Frankema (Eds.), *Organizational control* (pp. 51–79). Cambridge, UK: Cambridge University Press.

Chen, Y., & Bharadwaj, A. (2009). An empirical analysis of contract structures in IT outsourcing. *Information Systems Research, 20*(4), 484–506.

Choudhury, V., & Sabherwal, R. (2003). Portfolios of control in outsourced software development projects. *Information Systems Research, 14* (3), 291.

Chua, C., Lim, W. K., Soh, C., & Sia, S. K. (2012). Enacting clan control in complex IT projects: A social capital perspective. *Management Information Systems Quarterly, 36*(2), 577–600.

Corbin, J., & Strauss, A. (1990). Grounded theory research: Procedures, canons, and evaluative criteria. *Qualitative Sociology, 13*(1), 3–21.

DeLone, W. H., & McLean, E. R. (1992). Information systems success: the quest for the dependent variable. *Information Systems Research, 3* (1), 60.

Dibbern, J., Winkler, J., & Heinzl, A. (2008). Explaining variations in client extra costs between software projects offshored to India. *MIS Quarterly, 32*(2), 333–366.

Dokko, G., Nigam, A., & Rosenkopf, L. (2012). Keeping steady as she goes: A negotiated order perspective on technological evolution. *Organization Studies, 33*(5–6), 681–703.

Dunbar, A. E., & Phillips, J. D. (2001). The outsourcing of corporate tax function activities. *Journal of the American Taxation Association, 23*(2), 35–49.

Dyer, J. H., & Singh, H. (1998). The relational view: Cooperative strategy and sources of interorganizational competitive advantage. *Academy of Management Review, 23*(4), 660–679.

Eisenhardt, K. M. (1985). Control: Organizational and economic approaches. *Management Science, 31*(2), 134–149.

Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review, 14*(4), 532–550.

Faems, D., Janssens, M., Madhok, A., & Van Looy, B. (2008). Toward an integrative perspective on alliance governance: Connecting contract design, trust dynamics, and contract application. *Academy of Management Journal, 51*(6), 1053–1078.

Feldman, M. S., & Pentland, B. T. (2003). Reconceptualizing organizational routines as a source of flexibility and change. *Administrative Science Quarterly, 48*(1), 94–118.

Fersht, P. (2011). *The state of the outsourcing industry in 2011*. HfS Research, Boston, MA.

Gersick, C. J. G. (1991). Revolutionary change theories: A multilevel exploration of the punctuated equilibrium paradigm. *Academy of Management Review, 16*(1), 10–36.

Gewald, H., & Dibbern, J. (2009). Risks and benefits of business process outsourcing: A study of transaction services in the German banking industry. *Information & Management, 46*(4), 249–257.

Gregory, R. W., Beck, R., & Keil, M. (2013). Control balancing in information systems development offshoring projects. *MIS Quarterly, 37*(4), 1211–1232.

Heiskanen, A., Newman, M., & Eklin, M. (2008). Control, trust, power, and the dynamics of information system outsourcing relationships: A process study of contractual software development. *The Journal of Strategic Information Systems, 17*(4), 268–286.

Henderson, J. C., & Lee, S. (1992). Managing I/S design teams: A control theories perspective. *Management Science, 38*(6), 757–777.

Jain, R. P., Simon, J. C., & Poston, R. S. (2011). Mitigating vendor silence in offshore outsourcing: An empirical investigation. *Journal of Management Information Systems, 27*(4), 261–298.

Jaworski, B. J. (1988). Toward a theory of marketing control: Environmental context, control types, and consequences. *The Journal of Marketing, 52*(3), 23–39.

Kavčič, B., & Tannenbaum, A. S. (1981). A longitudinal study of the distribution of control in Yugoslav organizations. *Human Relations, 34*(5), 397–417.

Keil, M. (1995). Pulling the plug: Software project management and the problem of project escalation. *MIS Quarterly, 19*(4), 421–448.

Keil, M., Cule, P. E., Lyytinen, K., & Schmidt, R. C. (1998). A framework for identifying software project risks. *Communications of the ACM, 41*(11), 76–83.

Keil, M., Mann, J., & Rai, A. (2000). Why software projects escalate: An empirical analysis and test of four theoretical models 1, 2. *MIS Quarterly, 24*(4), 631–664.

Kern, T., & Willcocks, L. (2000). Exploring information technology outsourcing relationships: Theory and practice. *The Journal of Strategic Information Systems, 9*(4), 321–350.

Kirsch, L. (1997a). Portfolios of control modes and IS project management. *Information Systems Research, 8* (3), 215.

Kirsch, L. J. (1996). The management of complex tasks in organizations: Controlling the systems development process. *Organization Science, 7*(1), 1–21.

Kirsch, L. J. (1997b). Portfolios of control modes and IS project management. *Information Systems Research, 8*(3), 215–239.

Kirsch, L. J. (2004). Deploying common systems globally: The dynamics of control. *Information Systems Research, 15*(4), 374–395.

Kirsch, L. J., & Cummings, L. L. (1996). Contextual influences on self-control of IS professionals engaged in systems development. *Accounting, Management and Information Technologies, 6*(3), 191–219.

Kirsch, L. J., Ko, D. G., & Haney, M. H. (2010). Investigating the antecedents of team-based clan control: Adding social capital as a predictor. *Organization Science, 21*(2), 469–489.

Kirsch, L. J., Sambamurthy, V., Ko, D. G., & Purvis, R. L. (2002). Controlling information systems development projects: The view from the client. *Management Science, 48*(4), 484–498.

Knolmayer, G. F. (2007). Compliance-Nachweise bei Outsourcing von IT-Aufgaben. *Wirtschaftsinformatik, 49* (Special Issue), 98–106.

Lacity, M., Khan, S., & Willcocks, L. (2009). A review of the IT outsourcing literature: Insights for practice. *The Journal of Strategic Information Systems, 18*(3), 130–146.

Lacity, M., Willcocks, L., & Feeny, D. (1996). The value of selective IT sourcing. *Sloan Management Review, 37*(3), 13–25.

Lee, J. S., Keil, M., & Kasi, V. (2012). The effect of an initial budget and schedule goal on software project escalation. *Journal of Management Information Systems, 29*(1), 53–78.

Leonard-Barton, D. (1990). A dual methodology for case studies: Synergistic use of a longitudinal single site with replicated multiple sites. *Organization Science, 1*(3), 248–266.

Leonardi, P. (2011). When flexible routines meet flexible technologies: Affordance, constraint, and the imbrication of human and material agencies. *MIS Quarterly, 35*(1), 147–167.

Linberg, K. R. (1999). Software developer perceptions about software project failure: A case study. *Journal of Systems and Software, 49*(2–3), 177–192.

Locke, E. A., Chah, D.-O., Harrison, S., & Lustgarten, N. (1989). Separating the effects of goal specificity from goal level. *Organizational Behavior and Human Decision Processes, 43*(2), 270–287.

Locke, E. A., & Latham, G. P. (1994). Goal setting theory. In H. F. O'Neil & M. Drillings (Eds.), *Motivation: Theory and research* (pp. 13–29). Mahwah, NJ: Lawrence Erlbaum Associates.

Mani, D., Barua, A., & Whinston, A. (2009). An empirical analysis of the impact of information capabilities design on business process outsourcing performance. *MIS Quarterly, 34*(1), 39–62.

Maruping, L. M., Venkatesh, V., & Agarwal, R. (2009). A control theory perspective on agile methodology use and changing user requirements. *Information Systems Research, 20*(3), 377–399.

Mayr, E. (2002). *What evolution is*. New York, NY: Basic Books.

McGuinness, T. (1994). Markets and managerial hierarchies. In G. Thompson, J. Frances, R. Levacic, & J. Mitchell (Eds.), *Markets, hierarchies and networks: The coordination of social life* (pp. 66–81). London, UK: Sage Publications.

Miles, M., & Huberman, A. (1994). *Qualitative data analysis: An expanded sourcebook*. Thousand Oaks, CA: Sage Publications.

Newman, M., & Robey, D. (1992). A social process model of user-analyst relationships. *MIS Quarterly, 16*(2), 249–266.

Ouchi, W. G. (1979). A conceptual framework for the design of organizational control mechanisms. *Management Science, 25*(9), 833–848.

Pettigrew, A. M. (1990). Longitudinal field research on change: Theory and practice. *Organization Science, 1*(3), 267–292.

Poole, M. S., Van de Ven, A. H., Dooley, K., & Holmes, M. E. (2000). *Organizational change and innovation processes: Theory and methods for research*. New York City, NY: Oxford University Press.

Quaglia, L. (2007). The politics of financial services regulation and supervision reform in the European Union. *European Journal of Political Research, 46*(2), 269–290.

Rousseau, D. M., Sitkin, S. B., Burt, R. S., & Camerer, C. (1998). Not so different after all: A cross-discipline view of trust. *Academy of Management Review, 23*(3), 393–404.

Rustagi, S., King, W. R., & Kirsch, L. J. (2008). Predictors of formal control usage in IT outsourcing partnerships. *Information Systems Research, 19*(2), 126–143.

Sabherwal, R. (1999). The role of trust in outsourced IS development projects. *Communications of the ACM, 42*(2), 80–86.

Sabherwal, R. (2003). The evolution of coordination in outsourced software development projects: A comparison of client and vendor perspectives. *Information and Organization, 13*(3), 153–202.

Siggelkow, N. (2002). Evolution toward fit. *Administrative Science Quarterly, 47*(1), 125–159.

Sydow, J., Schreyögg, G., & Koch, J. (2009). Organizational path dependence: Opening the black box. *Academy of Management Review, 34*(4), 689–709.

Thompson, J. D. (1967). *Organizations in action: Social science bases of administrative theory*. New York, NY: McGraw-Hill.

Thompson, J. N. (1982). *Interaction and coevolution*. New York, NY: John Wiley & Sons.
Thompson, J. N. (1994). *The co-evolutionary process*. Chicago, IL: University of Chicago Press.
Thompson, J. N. (2010). Four central points about coevolution. *Evolution: Education and Outreach, 3* (1), 7–13.
Tiwana, A. (2010). Systems development ambidexterity: Explaining the complementary and substitutive roles of formal and informal controls. *Journal of Management Information Systems, 27*(2), 87–126.
Tiwana, A., & Keil, M. (2009). Control in internal and outsourced software projects. *Journal of Management Information Systems, 26*(3), 9–44.
Tsoukas, H., & Hatch, M. J. (2001). Complex thinking, complex practice: The case for a narrative approach to organizational complexity. *Human Relations, 54*(8), 979–1013.
Van de Ven, A. H., Delbecq, A. L., & Koenig, R. (1976). Determinants of coordination modes within organizations. *American Sociological Review, 41*(2), 322.
Van de Ven, A. H., & Poole, M. S. (1995). Explaining development and change in organizations. *Academy of Management Review, 20*(3), 510–540.
Williamson, O. (1991). Comparative economic organization: The analysis of discrete structural alternatives. *Administrative Science Quarterly, 36*(2), 269–296.
Yin, R. K. (2009). *Case study research: design and methods* (4th ed.). Thousand Oaks, CA: Sage Publications.
Zaheer, A., & Venkatraman, N. (1994). Determinants of electronic integration in the insurance industry: An empirical test. *Management Science, 40*(5), 549–566.

Information System Outsourcing Dynamics: A Case Study as Seen by a Client Boundary Role Person

Ari Heiskanen, Riitta Hekkala, Mike Newman and Merja Eklin

Abstract The paper presents an analysis of the evolution of the relationship between a large university and its software vendor. The parties were engaged in several projects that developed tailored information systems (IS) for the administration of the university. Three systems are the focus in this case study: student records, student admissions and student mobility. Our point of view is that of the first author who was an insider in this process as he acted as a boundary role person between the client and the vendor, first as the chief information systems officer of the university during the formative years of student records and student admissions, and later as a contracted leader for student records and student mobility after he joined another university. In the case of student mobility we also describe and analyse the dissolution of the client-vendor relationship. We also investigate the process through which the boundary role was terminated in the case of student records. Using the history data as the basis, the authors picture the dynamics of the action strategies of the client side. The conclusion is that in this case when

A. Heiskanen (✉)
Department of Information Processing Science, University of Oulu, Oulu, Finland
e-mail: ari.heiskanen@oulu.fi

A. Heiskanen
Silkkitie 1 C 46, 01300 Vantaa, Finland

R. Hekkala
Department of Information and Service Economy, School of Business, Aalto University, Helsinki, Finland
e-mail: riitta.hekkala@aalto.fi

M. Newman
Manchester Business School, The University of Manchester, Manchester, UK
e-mail: mike.newman@mbs.ac.uk

M. Newman
Turku School of Economics, University of Turku, Turku, Finland

M. Eklin
Center for Information Technology, IT Management, University of Helsinki, Helsinki, Finland
e-mail: merja.eklin@helsinki.fi

R. Hirschheim et al. (eds.), *Information Systems Outsourcing*, Progress in IS,
DOI 10.1007/978-3-662-43820-6_8

developing the student records system, the bond between the client and the IS vendor intensified more rapidly than the literature based on relationship marketing would suggest. Moreover, the relationship problems in IS development typically became apparent after a long period of cooperation, e.g., when the IS was taken into use and the parties realised that the functionality of the new system was inadequate.

Keywords Information systems outsourcing · Action strategies · Relationship management · Boundary role persons · University information systems · Reflective information system practitioner research

1 Introduction

It is well known that despite the numerous methods and strategies designed to ensure IS project success such as information system (IS) design methodologies, project management techniques and software process improvement, it is still not possible to guarantee a successful project outcome for all interested parties. According to the report of the Standish Group International (2004), 53 % of all IT projects fail to some degree: they are late or over budget, or both. It is even argued that under 20 % of IS projects are completed on time and within budget (Fitzgerald and Russo 2005). Information system (IS) outsourcing has been long seen to be one of the major issues facing organizations (e.g. Beath 1983, 1987; Feeny and Willcocks 1998; Gonzalez et al. 2009; Gurbaxani and Whang 1991; Kern and Willcocks 2000, 2008; Kirsch 1997; Kirsch et al. 2010; Klepper 1995; Lacity et al. 1996; Ngwenyama and Bryson 1999; Pannirselvam et al. 2011; Rustagi et al. 2008).

Different theories such as transaction cost theory (Gurbaxani and Whang 1991; Lacity and Hirschheim 1993) and agency theory (Gurbaxani and Whang 1991), an organization theory and resource-based theory (McWilliams and Gray 1995) have been used to understand IS outsourcing. Beath (1983, 1987) proposed a transaction governance approach based on organisational economics to explore exchanges between information systems departments and user communities. Bakos and Brynjolfsson (1993) used the economic theory of incomplete contracts, indicating that a buyer will often maximise profits by limiting their options and reducing their own bargaining power. Kern and Willcocks (2000) combine social exchange theory and social contract theory in order to develop a conceptual outsourcing relationship model. They argued that explaining outsourcing relationships needs more than an economic point of view alone; an understanding of the episodes of exchanges from an individual's standpoint is also needed (Kern and Willcocks 2000). In their further work, Kern and Willcocks (2008) developed a comprehensive framework for outsourcing risk mitigation and relationship advantage analysis. Different modes of control for IS development in an outsourcing arrangement have also been identified and analysed (Rustagi et al. 2008).

Many writers have argued that most of IS development and implementation failures are known to occur for human and organisational reasons (Griffith and Northcraft 1996; Panteli and Sockalingam 2005). Therefore the collaboration issues in IS projects are important and when there is more than one organisation involved in a common project, collaboration becomes even more demanding (Kotlarsky and Oshri 2005; Levina 2005). Feeny and Willcocks (1998) have argued that one of the core competencies of information systems managers is how to master the relationships with outside vendors. Pannirselvam et al. (2011) have analysed the strategic role of outsourcing and the impact of culture. They pointed out how studies have focused, for example, on cultural and team differences at the macro and organizational levels (research that addresses cultural gaps between organizations by focusing on how projects are organized and training for project managers who oversee IT projects and research that studies the impact of cultural differences on client vendor relationships and outsourcing success). One stream of research identifies how groups and individuals negotiate common ground to overcome organizational and status differences over time and points to ways in which understanding of organizational culture and individual and group behaviors could be used to improve the outcomes of daily tasks and decisions. (see also Levina and Vaast 2005). One stream has also focused on issues that consider differences in culture and team behavior in the light of control mechanisms for outsourced IT work. These two latest streams of research study the interaction between client and vendor teams at the micro task, inter-team, and individual levels of interaction. Our study focuses especially on the streams that focus on dynamics between client and vendor teams who work together towards the same goal. This paper presents rich description and analysis of how the client-vendor relationships evolved over the years 1990–2004 in a very complex setting. Our empirical data comes out of seven interlinked development processes. Six of them are about software development and the seventh is about personnel reorganising. We use a practice-based view in order to understand boundary spanning (Levina and Vaast 2005). The research question addressed in our paper is:

How are outsourcing relationships mastered from the boundary role person's point of view?

The paper is organised as follows. In the next section we present the relevant literature review for the paper. The third part of the study presents research methods and the fourth part discusses the case histories. The fifth part of study presents our findings out of the role of boundary spanners. After that part six discusses the major issues that boundary spanner helped address in the projects. Then we discuss about our findings and contributions. The paper ends with a conclusion where main insights and contributions for research and practice are briefly discussed.

2 Literature Review

Our aim is to analyse the behaviour of client and vendor in IS outsourcing. Relevant research literature on the paper topic are buyer-seller realtionships, boundary role persons in information systems outsourcing and conflict management. All of these are discussed in this section.

2.1 Buyer-Seller Relationship Evolution Analysis

Kern and Willcocks (2008, pp. 68–72) have identified **dependence**, **power**, **conflict**, **cooperation** and **trust** as the relevant elements for client vendor relationship. All these elements are complicated notions, but in brief, dependence means the degree to which the participants depend on each other to achieve their own objectives. Power means the degree of control and influence, conflict means negative perceptions about the exchange relationship with the vendor, cooperation means the undertaking of complementary activities, and trust means the client organisation's belief that the vendor will perform the required contractual exchanges and actions that will result in beneficial outcomes.

Klepper (1995) has used the article of Dwyer et al. (1987) to conceptualise the long-lasting buyer-seller relationships of IS clients and vendors. Klepper suggests that the relationship evolves through five stages: **awareness, exploration, expansion, commitment** and **dissolution**. The change of stage represents a major transition in how the parties regard one another. **Awareness** means that the parties recognise each other as a feasible exchange partner, but no cooperation exists yet. **Exploration** means the search and trial stage in relational exchange. **Expansion** means continual increase of exchange and interdependence of the partners. **Commitment** refers to a pledge of relational continuity. **Dissolution** means the end of cooperation when either one or both of the partners decides to withdraw from the relationship. For a single IS the stage model of Klepper (1995) can be mapped as follows. *Awareness* resembles the stage when the client is searching possible vendors for a software delivery and recognises that the vendor-to-be is a viable option. *Exploration* is very close to the stage that begins with a bidding competition. The IS business partners exchange requests for proposals and tenders, negotiate about delivery contract and finally sign the contract. *Expansion* covers the software development process, concluding when the new IS is ready for use. The *commitment* in IS development means that the developed IS is taken into continuous use. It is obvious that the contracts signed between the parties dictate the final commitment to the relationship: it is possible that in the beginning of the expansion stage the parties have together decided to bear the burden to develop the contracted software into full functionality. When there are several common IS development projects between the parties, previous projects obviously condition the establishment of later ones. According to Klepper (1995), exploration,

expansion and commitment contain five sub-processes: attraction, communication and bargaining, development and exercise of power, norm development and expectation development.

The subprocesses are factors that work in the three stages of exploration, expansion and commitment to deepen or weaken the bonds between two interacting firms. It is unclear whether Klepper wants to indicate that the subprocesses are factors in the sense the word factor is used in the distinction between factor versus process studies (Markus and Robey 1988). He may also mean that the subprocesses are recurrent features that are present in the main stages, embedded in action sequences. Kern and Willcocks (2008) criticise Klepper (1995) in that he did not take into account contracting and its effect on the resulting relationship; another drawback is the neglect of the analysis of the evolution of management processes. Another issue in Klepper's analysis (1995) that needs better treatment is that often during the IS development process the bond between the parties has grown strong and it is very difficult for the client to change the vendor (Whitten and Wakefield 2006). Sometimes the dissolution of the relationship may come prematurely if the development project fails. Should the development project succeed, typically the vendor continues as a maintenance provider. This relationship may last until the client organises a new process to replace the IS with a new one, and perhaps changes the vendor via a bidding competition. We present later in this paper two different IS development trajectories: one case where the client-vendor bond was made strong in purpose, and another case, where the bond could be easily dissolved.

It is acknowledged that IS development may entail conflicts between the participants. This area has long been a topic of investigation (e.g. Barki and Hartwick 2001; Robey and Farrow 1982, 1989; Robey et al. 1993). A necessary condition for a conflict between two or more parties is that the parties are **interdependent** (Barki and Hartwick 2001). That is, the attainment of the goals of one party depends on the behaviour of the other(s), and vice versa. **Disagreement** is the second necessary ingredient of a conflict. The parties may disagree over values, needs, opinions, goals. The third ingredient of a conflict is **interference,** which means that one or more of the parties interferes with or opposes the other party's attainment of its interests, objectives or goals. The fourth property of a conflict is **negative emotion** that may emerge when there are major disagreements.

Conflict management styles include the following five modes according to Barki and Hartwick (2001): **asserting**, **accommodating**, **compromising**, **problem solving** and **avoiding**. It is interesting to note that the issues associated with IS conflicts have much in common with the issues found in successful strategic partnerships. This is evident from the analysis of Mohr and Spekman (1994), who list the following factors that affect the success of strategic alliance (p. 137): attributes of the partnership (commitment, coordination, interdependence and trust), communication behaviour (quality, information sharing and participation) and conflict resolution techniques (joint problem solving, persuasion, smoothing, domination, harsh words and arbitration). Even though the relationship between

the IS vendor and client is a fee-for-services, the characteristics of the relationship resemble those of a strategic partnership.

Looking at the conflict management issue from another point of view, each party may use either negotiations for handling the conflict, or may withdraw from the relationship. The first strategy is often called voice and the second one exit (Alajoutsijärvi et al. 2000). An additional useful distinction is the analysis of the orientations of the negotiators (McCall and Warrington 1989). First, they can be either assertive or unassertive. Second, they can be cooperative or uncooperative. By combination we get four different negotiation behaviours: avoiding (uncooperative, unassertive), accommodating (unassertive, cooperative), competing (assertive, uncooperative) and collaborating (assertive, cooperative). The fifth style would be compromising, meaning a behaviour that is somewhat cooperative and somewhat assertive. McCall and Warrington (1989, pp. 25–26) argue that avoiding and accommodating are not normally expected in negotiating. Competing behaviour is based on power, and agreement is reached only if the other party accommodates. Collaborating presumes that joint problem solving is possible. Compromise means that both sides take and give.

It is reasonable to suppose that the high failure rate of IS projects (Keil et al. 2000; Fitzgerald and Russo 2005) increases the possibility of conflict between IS client and vendor, because quite easily the partners attribute the reason of failure to the other party. Conflicts between client and vendor in outsourced IS development may be inevitable, because of their adversarial relationship: a euro to vendor's wallet is away from the client's wallet. Even during periods of client satisfaction, there may be doubts that the deliverables of the vendor are over-priced. Dwyer et al. (1987) argue that conflicts between client and vendor are essentially beneficial. These writers admit that conflicts may have destructive consequences such as hostility and bitterness, but their argument says that suppressing conflicts in a buyer-seller relationship will mean a relationship that has lost its vitality. They mention functional benefits of conflicts like more frequent and effective communication, establishment of outlets to express grievances, critical reviews of past actions, a more equitable distribution of resources, a more balanced power distribution in the relationship and standardization of modes of conflict resolution. And furthermore, as Jehn and Mannix (2001) argue, conflicts evolve over time: they are dynamic.

2.2 *Boundary Role Persons in Information Systems Outsourcing*

The contractual relationship between the client and the vendor is managed by a small number of representatives of both sides. These persons can be called gatekeepers (Pettigrew 1972; Heiskanen and Similä 1992), boundary role persons

(Adams 1976), boundary spanners (Levina and Vaast 2005) or negotiators (McCall and Warrington 1989). They are key players in two directions. First, they bring the views of the members of their own organisation to the negotiation table with the other party. Second, they bring back the views of the other party to the members of their own organisation. The interpersonal interactions among them are central to the business relationships between the organisations, as well as to the decision making of the parties.

Storbacka et al. (1994) have identified that critical episodes may be important for the continuation of the relationship. Episodes can be critical for several reasons, such as because of the size of the values exchanged during the episode or because of the way each of the partners behaves in handling the issues of the episode. Typically, critical IS episodes are related to the periods of setting the price of services delivered, or eras when the partners negotiate how to recover from malfunctions in deliveries. Trust and control are key concepts in the client-vendor relationship and in the work of boundary role persons. Trust (and control) can be discussed either on individual level (Cong and Chau 2007) or organisational level. Without going into the details of the literature (e.g. Das and Teng 1998, 2001; McEvily et al. 2003; Gallivan and Depledge 2003; Kern and Willcocks 2008; Kirsch et al. 2010; Möllering 2005; Reed 2001; Sambamurthy and Jarvenpaa 2002), it seems that both trust and control are complicated notions. They are moreover related to the power that can be exercised in the relationship by the parties (Jasperson et al. 2002). Equivocation may also characterise the relationship when either of the parties is suspicious that the other may not try to fulfil its promises. We have discussed elsewhere these notions in depth (Heiskanen et al. 2008); here we concentrate on the dynamic issues of the client-vendor relationship, as seen by a boundary role person, the first author.

Levina and Vaast (2005) have investigated the manifold roles of boundary role persons, or boundary spanners as they call them. Roles can be like a representative versus gatekeeper, advice versus trust broker, or a scout, ambassador, sentry or guard. According to Levina and Vaast, the multiple roles of boundary spanners often come into conflict, leading to stress and burnout. They also found that several different persons may adopt the role of boundary spanner. Some of the spanners are nominated, some of them adopt the role according to specific circumstances. What is lacking in the analysis by Levina and Vaast (2005) is the action dynamics of boundary role persons, the same omission can be found in several other articles of boundary spanning. Furthermore, Levina and Vaast (2005) do not consider contractual issues between the organisations they are investigating. According to our experience (Heiskanen and Similä 1992), managers are powerful gatekeepers, because they must sign the contract that is the basis for client-vendor cooperation. The contract defines the framework under which the various organisational and occupational groups find the fields of interaction.

3 Methodology and the Main Research Cases

This study is a qualitative case study and partly revisits data from our earlier studies (e.g. Heiskanen et al. 2008). A case study can involve single or multiple cases and many levels of analysis. The main characteristics of a case study are that the aim of the research is to explore certain phenomena and to understand them in a particular context, and that the researcher uses multiple methods for collecting data. (Yin 2003) However, Yin is writing from a positivist perspective—what he means by 'phenomena' is not what an interpretive researcher means. Robey et al. (2000, p. 133) maintain that 'case studies provide the greatest detail on the role of experience' and that case studies emphasise the rich context in which the phenomena occur (Eisenhardt and Graebner 2007). Eisenhardt (1989, p. 548) also recommends the use of the case study approach if 'little is known about a phenomenon, current perspectives seem inadequate because they have little empirical substantiation, or they conflict with each other or common sense' (Eisenhardt 1989, p. 548). There is a lack of studies on how outsourcing relationships may strengthen or weaken in outsourcing settings in the IS field, and a case study approach gives a unique opportunity to approach this area of research. Levina and Vaast (2005) used practice-based view in order to understand boundary spanning in practice. Our motivation is to increase the understanding of the behavioural nuances of contractual IS development, seen and experienced from the inside.

Our data consist of archived materials gathered over the years as the first author's personal project documentation, notes, contracts, memos of meetings, e-mail messages and master's theses which analyse some same cases (Eklin 2005; Jokelin 2000; Saarinen 2001; Tapio 2002). With the aim to understand organisational background, past IS conditions, current initiatives, future vision, and the driving forces, documentation analysis and observations were added to the research data. The aim of this article is to give a rich description and analysis of how the client-vendor relationships evolved over the years, using notions from the relationship marketing research tradition (Alajoutsijärvi et al. 2000; Batonda and Perry 2003; Christopher et al. 1993; Dwyer et al. 1987; Kern and Willcocks 2008; Klepper 1995; McCall and Warrington 1989; Storbacka et al. 1994).

Our analysis of the project histories began in 2001. The storylines of the five earlier (student mobility excluded, because it began in 2002) IS histories were first written, based on documents kept on projects. Then, for the client-vendor relationship investigation, the first author wrote a nine-page document detailing 98 major events including contracting issues and his interpretation for the period from 1990 to December 2001. This event list document was sent to the vendor project leader to be commented upon. The project leader generally agreed with our portrayal of the development history; discrepancies, concerning issues of trust and control, and detailed research method are discussed in Heiskanen et al. (2008). For the years 2002–2004 we collected data only from the client sources.

The research method used in this study can be seen as a branch of the wide array of action research options (cf. Coghlan and Brannick 2002). As the research

articles are written "after-the-fact," we can describe our research approach as retrospective action research (Gummesson 2000). IS history writing is also near to our approach (cf. Mason et al. 1997a). The distinctive feature is that the roles of the researcher and the practitioner are combined into the same (single) person. We call this kind of person as a RISP (Reflective Information Systems Practitioner). This approach has also features of autoethnography (Anderson 2006; Boyle and Parry 2007).

Inspired by Schön (1983), the first author in his dissertation (Heiskanen 1994) put his direct experience from practice as an IS professional into a form that made sense to both the academic and the practical audience (see also Heiskanen 1995). This kind of research has strengths and weaknesses (Coghlan and Brannick 2002; Gummesson 2000; Heiskanen 1995; Heiskanen and Newman 1997; Heiskanen et al. 2008; Klein and Rowe 2008). The strengths are that access to the research site and many data sources is easily established, and the observation period can be extensive with minimal research resources. Also the mastering of the vast amount of historical documents is often easier for an insider than for an outsider, because the insider has memory traces for tracking a special document (cf. Coghlan and Brannick 2002). A serious weakness is the danger of post-rationalisation and one-sidedness. The researcher should consider the reflective process as a possibility of personal growth, not to produce results at any price, because the danger of false research exists. The risk is that a practitioner/researcher can easily construct misleading "research" data to support nearly any argumentation. Reliance on organisational documents, preferably produced by other authors than the practitioner/researcher, is an asset. Post-rationalisation is a threat also in "normal" organisational research, because individual informants may be image-conscious and use retrospective sense-making, producing a picture that puts their own impact to look too favourable (Eisenhardt and Graebner 2007). Robey et al. (2000, p. 134) also state that 'A fundamental problem with experience is that recent experience must always vie with older experience'. Someone could also claim that while investigating others' experiences they can be characterised as only the tip of the iceberg as we normally do not know the histories of other people.

The insider researchers should develop procedures to cope with research reporting about conflicts in which they are involved. Sometimes it is enough to report in a conservative way, not revealing much of the conflict. If the conflict is essential for the research, like in this paper, then it is necessary to base the description of the conflict on organisational documents (cf. Klein and Rowe 2008). Schön (1983) suggests that a reflective practitioner should "step back" when investigating his or her own practice. In our case this stepping back has meant a long time interval between the analysed process and final reporting. The writing of this article (and Heiskanen et al. 2008) began in 2001, but publication entailed considerable delays. It is reasonable to suppose that the retrospective analysis has benefited from the long time distance, because, it is hoped, time has calmed down the hot feelings and strong emotions that were produced by the events. The first author remembers (backed by documented short notes) vividly when his colleagues remarked that his voice got louder when he spoke about some vendor

representatives. This was during the most heated period of client-vendor conflict resolution in autumn 2000.

An additional issue is the anonymity or identity of the author and other actors or informants. The first author has chosen a writing style that does not hide his identity and practical role, because it explains how and why he has such an intimate access to some data. The disclosure of individual actors and the role of writers vary in in-depth studies of information systems. For example, in the Harvard history project, Copeland and McKenney (1988); Mason et al. (1997a, b); McKenney et al. (1997) give the names of individual actors, while typical ethnographers, e.g., Schultze (2000), Barley (1990) and Levina and Vaast (2005), use pseudonyms for their informants and research sites. Generally, it is often considered unfair in the social sciences to report in such a way that an individual can be identified. However, in historical studies the procedure is totally different: the anonymity of individual actors is of no concern. In our reporting, vendor firms appear with their own names, but the identities of the vendor representatives are not revealed, but rather are denoted by fictional pseudonyms.

The major target of this article is the process by which up to 13 (in 2004) Finnish universities in a consortium with outside software houses developed a common student record system, called Oodi (www.oodi.fi ; Heiskanen et al. 1998, 2008; Nurmi et al. 2008; Eklin 2005; Jokelin 2000; Saarinen 2001). Currently, there are about 110,000 students and 20,000 employees within these Oodi universities. Thus the number of direct Oodi users is well over 100,000 individuals. In this article we follow Oodi development during the formative years 1995–2001. These years contain relationship problems between the client and the vendor, and crises and conflicts in software development. Eventually, at the end of this period Oodi software was in reasonable shape and the relationship between the client and the vendor had calmed down to be a "normal" client-vendor relationship. In addition to the software development, we describe and analyse how the Oodi consortium personnel was reorganized in 2004. We also present five other software development processes that were related to Oodi.

For this kind of research, it is essential to know how the authors are related to the case. The first author acted as a boundary role person or a boundary spanner (Adams 1976; Levina and Vaast 2005) between the client and vendor representatives as a part of his role as the Chief Information Systems Officer of the University of Helsinki during the years 1984–2000. In 2001 he moved to the University of Oulu, still remaining in his previous unit as a contracted part-time project director for the Oodi consortium until summer 2004. During the years 2004–2006 he was a contracted leader of the student mobility project (see Sect. 4.4). The fourth author was a project manager in an Oodi university during the research period and later in autumn 2001 became a project manager for the Oodi consortium. The insider view of these authors is balanced by the background of the second and third authors. The second author has investigated inter-organisational information systems from the outside and is an expert what comes to the nuances of this kind of arrangements. The third author has a considerable experience with contextualised social process

modeling. He also spent considerable time validating the data sources and writings of the first author. The third author also conducted interviews at four Oodi sites.

Our research case is complicated because there are several software vendors and user organisations. The major parties of our case were the University of Helsinki (UH) and two software houses, Novo Group (Novo; later Logica) and its subsidiary company Karjalan Tietovalta (KaTi). During the key investigation period UH had 35,000 students pursuing for a degree. Its full-time equivalent number of employees was 7,700 and the annual budget about 370 million euros. The University of Helsinki represented the other Oodi-universities in negotiations with software vendors. In this context the first author's role was as the director of the Oodi consortium, including the tasks of the foremen of consortium personnel (project managers). His task was also to take care of the relationship with the software vendors and prepare the decisions for the Oodi board. The personnel of Novo was about 2,200 and annual turnover 320 million euros. By comparison, KaTi was a much smaller software house. The number of personnel at the beginning of the cooperation in the early 1990s was below ten. During the core part of the history the number of personnel was about 30 and the annual turnover about 2.6 million euros. In June 1999 Novo bought KaTi. At the beginning of 2002 KaTi stopped to be an independent firm and was merged with Novo. The authors have chosen six IS histories to describe the evolution of the client-vendor relationships (see next chapter). The reason to choose these particular cases is that they form a logical chain: previous case histories give a basis for the further actions and expectations of the client. In addition to these systems, Novo has delivered IS products and services for UH in accounting and data warehousing. We next proceed to the description of the IS project histories with detail events.

4 Findings

4.1 The Preliminary Histories

Three of the case histories—the auditorium reservation system, the budgeting system and the dental clinic—are shorter descriptions and form the background for the three "major" stories, the Oodi student records system, the Oodi admissions module and MoSu, student mobility support. The preliminary histories are presented in this section. In the early 1990s KaTi, chosen after a bidding competition, delivered an auditorium reservation system for University of Helsinki (UH). The development process[1] appeared problematic between the project leader and the CEO of the vendor during the development process. The reason for these problems was that the project leader could not handle his workload. However, eventually in

[1] The case description is based on project documents, including five paper folders in the UH archive.

1995, the system was as the users wanted. The inferior economic performance of the firm was the reason to let the CEO go. The new project leader (Kim, a subcontractor for KaTi), was thought to be skilled for the job and he was supported by the new CEO (Patrick). Both newcomers later continued cooperation with the client in the Oodi process.

The development process of the budgeting system[2] (Heiskanen and Newman 1998) began in 1991 following the Finnish State decision that a new management procedure should be installed in all state bureaus. In early 1993, after a bidding competition, it was decided that the budgeting system specifications would be developed with Novo. In October 1993, the State Computing Centre approached UH with an attractive tender for a state-of-the-art client-server budgeting package that was promised to have all the functions UH would need. It was "aggressively" priced with UH acting as a pilot customer. After bargaining with both possible vendors UH made a decision to develop the budgeting system with the State Computing Centre. The further analysis of the budgeting system development process is outside the scope of this article. What is relevant here is how the first author perceived the bargaining behaviour of the Novo executive and director (Oscar, Hugh). Discussions were straightforward and open, and it seemed that both parties understood the point of view of the other. This gave them credibility for further projects.

In October 1996 Novo and the Dental Clinic of UH signed a contract that Novo would deliver an integrated dental, patient, dental student and billing and accounts receivable system.[3] The Clinic would act as a pilot customer of this product that Novo planned to introduce into the market. In November 1997 the personnel of the Clinic contacted the first author and asked whether he could help in negotiations with the vendor. The project was in trouble, although the system was in use. The response times were extremely long, occasionally data were lost by the system and sometimes the system totally collapsed.

It appeared that the integration of the parts of the system had not succeeded. In addition to these problems, the original vendor of the dental subsystems from which Novo had obtained this part announced that it would not continue the development of the dental system. Key persons of the original vendor had left the firm and a Novo executive (Oscar) began to suspect that the dental part was not operational at all. The agreement was cancelled in October 1998. The vendor paid fair penalties, although the billing and accounts receivable subsystem was accepted and paid for by the client. The impression the first author got from the acts of Novo during the process was that the vendor executive (Oscar) accepted his responsibility and did not try to stretch the contract to the advantage of his firm.

[2] The case description is based on project documents, including seven paper folders in the UH archive.

[3] The case description is based on project documents, including one paper folder in the UH archive.

4.2 Oodi

In 1995 five Finnish universities began a feasibility study to produce a common IS to replace a variety of outdated student record systems (Heiskanen et al. 1998). This Oodi software would support administrative personnel, teachers and students with a state-of-the-art user interface and www capabilities, and should enjoy an operating life of at least 10 years. The consortium expanded to 13 university members in 2004. In 2001 where our investigation period of Oodi ends, there were eight members in the consortium. Oodi has been developed by the university consortium and an alliance of two software vendors (KaTi, Novo) that first won the bidding competition of the specification project in spring 1996, and later won the bidding competition of design and programming in spring 1997. It was the client's choice to suggest that two rival software houses, KaTi and Novo, should cooperate in the Oodi development. KaTi and Novo both already had software packages for student records, KaTi for universities and Novo for polytechnics; so they both knew the business area. If a single software house had been the decision, KaTi would have been the choice. In addition to the modest price of its bid, the key persons (Patrick, Kim) of this small vendor were familiar to the first author from previous cooperation. However, the size and the risks of the project were perceived by the client to be so great that a sufficiently large software house was needed. Should the project fail, a big vendor could recover the loss and pay the penalties. The vendors and the client consortium together chose Compuware's Uniface 7.2 to be the development and deployment tool. Later this choice was claimed by the vendor to be a reason for the majority of the problems. Whether this is true remains unanswered in this paper. What is evident from the case history is that this combination of application, vendor and software tools did not perform as the client expected.

The parties signed several contracts about the Oodi development. A summary of the contracts is in Table 1. A 5 year long skeleton contract and planning project contract were signed in April 1997, with no possibility for the parties to serve a notice of termination on the contract. The only way to terminate the cooperation would have been to dissolve the contract, which would have meant a legal process. In this way the relationship was "cast in concrete". The price level for vendor services defined in the skeleton contract was not strictly defined; the most expensive option would be that the vendor would use its standard price list. In this way the client restricted its own bargaining behaviour and showed goodwill towards the vendor (cf. Bakos and Brynjolfsson 1993). The specification and planning phases did not pose any apparent problems in 1996 and 1997. The client and the vendor negotiated intensively about the price of the programming phase in early 1998. The client used an external consultant for the evaluation of the first bid of the vendor. Finally, the target price was set about 10 % below the bid, without removing any activities from the project plan. The maximum price the client would pay was also set. Should the vendor succeed to deliver the system with a lower cost than the target price, it would get an extra bonus.

Table 1 Summary of contracts for Oodi development between the client consortium and the vendor alliance

Contract and date of signature	Time frame	Value (1000€)	Estimated amount of work (days)
Specification 24.9.1996	10.9.1996–31.1.1997	158	302
Skeleton contract 22.4.1997	22.4.1997–22.4.2002	NA	NA
Planning 22.4.1997	14.4.1997–19.12.1997	242	450
University adoptions 15.4.1999	1.2.1999–31.5.2000	Hourly rates	349
Programming 14.5.1998	1.2.1998–30.4.1999	706–745	1355
Maintenance 2.2.2000	Ongoing	Hourly rates	NA

However, when the first pieces of software were delivered in 1999, it appeared that the functionality of the software was not as the client representatives wished. As quickly became obvious, the client representatives had not made enough effort to read and correct the planning documents. Moreover, they complained that the vendor workers had only mechanistically transformed the plans into programs, without giving enough consideration to how it would have been possible to work smoothly with the system. It is possible to speculate that by increasing the users' involvement the results would have been better. However, the first author was at that time of the opinion that the project group had sufficient expertise and more involvement from the user side would have been impossible to arrange. The software contained a large number of bugs, the removal of which was slow and tedious. Moreover, the client requested a lot of changes to the functionality of the software. Work progressed, however, and the development project was formally ended in August 1999. The work continued based on the warranty of the software, as well as normal maintenance. It is important to recognise that the contractual relationship changed from a fixed price delivery of software according to the specification and design documents to service provision in the maintenance of the software.

Two members of the client consortium, UH and the Lappeenranta University of Technology, had to begin the use of Oodi before the millennium change because of anticipated Y2 K problems of the legacy systems. This appeared to be a problem-fraught operation, because the testing of the software was not complete. The system was also slow to use. User personnel had to work over-time, and Lappeenranta had to hire extra clerical workers. An additional problem was that the web application of Oodi did not function at all in the Lappeenranta network. The web application was supposed to be used in the course and examination registration by the students. This had worked well with the old system, but now it required a manual work-around. In May 2000 the web application tools were changed from Uniface to Java and WebLogic. With these tools the vendor was able to deliver an acceptable web application that was put into use in Lappeenranta in August 2000. All these problems got public attention in a local newspaper and the periodical of the student union, which published an obituary of Oodi. Testing proceeded slowly

during spring 2000. The client had already requested more programming resources from the vendor in December 1999, but the vendor did not manage to do this. The vendor had allocated its resources according to the negotiations performed in autumn 1999. In January and February 2000 it became apparent that more money was urgently needed to get the software ready. So in March UH loaned 2 million marks (about €336000) to the consortium, nearly doubling the consortium budget for the year 2000. It was agreed that other universities would pay the loan back by the end of 2003.

Gradually during the year 2000 the vendor was able to raise the development resources up to a level of about seven full-time persons equivalent from the previous level of four. About 15 persons participated in spring 2001 in Oodi work from the vendors' side. The amount of vendor resources was reduced in 2002 to around four full-time equivalent persons. The first real indication of the eventual success of Oodi was that the Helsinki School of Economics and Business Administration adopted Oodi successfully in April 2001. The total number of bugs removed or features changed until October 2001 was 1466. Another indicator of later success is that new universities voluntarily joined to the Oodi consortium. At the end of our target period (December 2001) the Oodi software was in reasonable shape. This was later confirmed in UH and Oulu University where users produced high scores for satisfaction in surveys. UH organised a bidding competition in summer 2001 for the delivery of IS development and maintenance services, including also Oodi and the admission module (see the next section). The outcome was that three software vendors were nominated as the preferred Oodi software houses. So Novo got two rivals (Ineo and Solenovo). To conclude this section of Oodi development, the relationship between the clients and the vendors can be considered as normalised when comes to finding solutions to problems.

4.3 Student Admissions System

This[4] was a direct purchase by UH from the smaller vendor of the Oodi vendor alliance, KaTi. The old admission systems of UH, which totalled 15 different modules, were cumbersome to maintain and the renewal was considered necessary. The rationale for using this particular vendor involved the following three factors when the first development contract was signed in September 1998. *First*, the Oodi consortium as a client was not a unified entity, but consisted of independent universities. To reach a common decision often required long negotiations and took much time (cf. Nurmi et al. 2008). With a single customer, the first author believed that the development of the client-vendor relationship would be easier. *Second*, the resources that had been developing Oodi were thought to be free for

[4] The case description is based on project documents, including three paper folders in the UH archive.

new tasks after the Oodi delivery, which was planned for early spring 1999. *Third*, the smaller vendor seemed to be more capable than the larger one for this project; therefore it was decided to go ahead with the project with only the smaller software house, KaTi. The reasoning might have been sound, but it led to a stressful period. The admissions system should have been in use for pilot admissions in summer 1999. Soon it was realised that this schedule was too optimistic, especially in the light of delays to the Oodi development, and it was decided that the system should be up and running in spring 2000. In summer 2000 the admission module had the same kind of symptoms as the first incarnation of Oodi. It contained a large number of errors. The long response times made it necessary for the university personnel to work over-time. Some of the performance problems were caused by the poor cooperation between UH's data transmission network and the application. In spite of the unfinished software, the admission routines were handled with the new admissions system.

Responsibility for the functionality of the technical environment for this application appeared to be a controversial issue between the parties. The client thought that it was the vendor who should have taken care of this. The client supported this argument by quoting the adoption project plan that was an appendix to the contract. The vendor expressed the view that it could not possibly take responsibility for the functioning of the client's network. In autumn 2000 the representatives of UH and KaTi negotiated how the software for the admissions could be improved in the following year. The client hired an independent Uniface consultant to inspect the software in order to get a second opinion of the internals of the software, especially of its performance. It was also thought that the report would be helpful to the vendor, because it would indicate what to do. Some of the faults of the software were corrected as a part of the warranty; the rest were agreed to be changes that the client would pay for. During these negotiations, the views of the parties about the poor performance of the software were controversial. The vendor claimed that it had delivered the system accurately as was specified. The client interpreted this claim to mean that it had ordered an extremely slow system. Both parties held their positions throughout the negotiations. Below is a quotation from a meeting memorandum;[5] the client's view is in plain text and that of the vendor in italics. The vendor view was written by Keith, a successor of Oscar:

> The problems of the admissions module have aroused wide dissatisfaction in the University. The client has got the impression that the vendor thinks that it had delivered what the client ordered, i.e., the slowness of the user interface is included in the order and improvements are modifications that should be paid for by the client. *According to the vendor, the application has been delivered according to the specifications.*

However, the vendor and the client eventually agreed upon what should have been in the original delivery and what were the modifications that the client should pay for. In the summer of 2001 the software performance was considerably better

[5] This was a part of an e-mail message that fulfilled the role of a meeting memorandum (date 4.12.2000); translated into English by the first author.

than in the previous year. The interaction between the application and the University network did not cause significant problems. The software still needed improvements, but now it could process the data of 25 admissions in five faculties. The admissions module was in good shape for the admission round in 2002. So this project reached a satisfactory service level, but the price of the software, however, had risen significantly higher than expected at the beginning of the process.

4.4 Student Mobility Support

In 2001 Oodi consortium had a difficult economic situation and it sought co-operation with Finnish Virtual University (FVU) in order to get extra funding from the Ministry. FVU, founded in 2000, was a consortium of all Finnish universities. The task of FVU was to promote modern web-based activities for its members. In several occasions Oodi actors discussed that Oodi software could be made as the back-bone of the FVU. A major reason for this was the grave monetary situation of Oodi consortium: it was thought that that cooperation with FVU would lead to monetary support from the Ministry. In June 2001 Oodi Consortium representatives had a meeting with leading officers of the Ministry. Developing an information system to support FVU was on the agenda. This venture got positive feedback from the Ministry, which later in 2002 materialised as financial support for the cooperation of the two consortia. The most important area was identified to be the support of student mobility between universities, meaning that students could choose courses from "foreign" universities and include them in their degrees obtained from their "home" university. The planning of the project to specify requirements for this new system began gradually in autumn 2001. Oodi Consortium personnel had several meetings with the personnel of FVU during spring 2002. The student mobility pilot project (StuMo) started in May 2002. The client project manager came from FVU. Two Oodi vendors (Novo, Ineo) were enrolled as software developers without a bidding competition. The client decided that the vendor project manager should come from the minor Oodi vendor, Ineo. Project group consisted of members of the personnel of Oodi and FVU, as well as the experts of the two Oodi vendors. The task of the StuMo project was to make the specifications of the system-to-be and produce a user interface prototype. These materials would be later used as the basis for a bidding competition to produce a functional system. StuMo budget for service purchases from the vendors was 220.000 euros, divided equally between the two Consortia.

The StuMo project proceeded without apparent difficulties in 2002, although there were some problems in how the project manager could cope with the various elements of the project budget. In early 2003 it was the time to consider how to continue for a functional system. In spite of the seemingly smooth progress of the StuMo, the first author began to ponder that the forthcoming student mobility support development project called MoSu might be organised in a different way as compared to the StuMo project. For this purpose, Helsinki University, in consent

with two other Oodi organisations (Helsinki School of Economics, Helsinki University of Technology), applied funding from the Ministry to finalise StuMo as a functional system for these three organisations. This MoSu system would later be made available for all FVU member organisations. The piloting approach meant that the whole Oodi Consortium (13 members in 2003) was replaced by the three piloting universities that were all using and developing Oodi. This restriction apparently simplified the organisational settings. The Ministry allocated €300.000 for each year 2004–2006 for this purpose, the total MoSu development budget thus being €900.000. The Ministry required that also a non-Oodi university should be enrolled to the forthcoming MoSu project.

After discussions with the leading officers of these three organisations (HU, HSEBA, HUT), the conclusion was that the MoSu development leadership and project management would come from Oulu University, where the first author now worked. The rationale for this decision was that more experience in leading and managing this complex inter-organisational IS development project was needed. Oulu University could provide a capable IS project manager and the first author would be the responsible development leader for the software purchase. In addition, Oulu University could provide a quality assurance group. StuMo ended in June 2003. The project board approved the results of the project, as suggested by the client and vendor project managers. The project members were satisfied with the outcome of the project when they were asked to record their opinion in the final project report. The development of MoSu began in two meetings (June and September 2003) where the new project manager was introduced to the stakeholders and the general shape of the development process was outlined. Autumn 2003 was used for tasks of a bidding competition that would result in obtaining tenders from the prospective vendors in early January 2004.

The bidding competition contained some interesting twists and turns. The form of the competition was a restricted negotiation process, which meant that the client chose some of the prospective vendors for negotiations. The call for proposals yielded nine vendors that were willing to do the job. The client chose four of them (Novo, Ineo, Solenovo, and CSC) to enter the negotiations. The first strategy of the client aimed at a fixed price delivery that would be preceded by finalising the specifications produced in StuMo. Ineo and Novo would take care of this, Solenovo being the inspector of this work. During the negotiations the client emphasised that inclusion of the expertise of CSC would be important because of its central position in providing IT, data communication, and user identification management services for all Finnish universities. However, Novo with Ineo put in a tender without mentioning CSC at all. When the client reacted to this, Novo sent an amendment that included CSC. In March 2004 the final outcome of the bidding competition was that both previous software houses (Ineo and Novo) were replaced by two new ones, Solenovo and CSC. The reason to choose Solenovo as the primary vendor was that the first author trusted that this firm would eventually deliver the right system, in spite of the fact that the customer might not know which kind of IS they would need. The trust towards Solenovo was based on a long cooperation between Solenovo and Helsinki University. For example, Solenovo was in key role in the

complicated data transfer to the Oodi database from the preceding system. The inclusion of CSC, a firm owned by the Ministry, was thought self-evident by the client.

During the bidding process it became clear that the specifications made during StuMo project were inaccurate and needed improvements before they could be used as a basis for software development. The first indicator of this was an evaluation report and question list made by Solenovo.[6] The low quality of the specifications was a confirming issue to let Novo and Ineo go. Later the low quality of the specifications was evidenced in many occasions, although some MoSu actors thought that there was no real need to go back to the specification work. The negotiations with CSC and Solenovo lasted to March 2004. During this process it became clear that a fixed price delivery would be infeasible, because requirements were too difficult to decide in advance. So the vendors started the work with billing by the hour. CSC and Solenovo had difficulties to find a right balance in division of labour, mainly because of personnel changes in CSC. Therefore the contracts were finally signed at the beginning of 2005, in the middle of development work.

4.5 Oodi Consortium Reorganisation

The development of the Oodi Consortium over the years was also reflected in changes in the staff. The number of staff working for the Oodi Consortium was on the increase over the years. A crucial change in personnel resources did take place early 2005, when two new project managers were hired. In September 2004 a full-time project director was hired for consortium administration, and consequently the first author stepped down from the director's post. The major rise in the resources in 2005 was mostly caused by the increased need for modifications to the system as a result of the changes necessitated by the degree reform. In autumn 2005, the fourth author resigned from Oodi project, and started new tasks in Helsinki University. After 2005, there was a considerable turn-over of personnel in Oodi consortium (Puolanne 2007).

In spring 2003 some of the IT managers of the Oodi Consortium universities expressed that the operation of the Oodi Consortium should be intensified through reorganisation. Another idea was to incorporate the operations into a company of its own. As incorporation would have been difficult due to legal reasons, the establishment of a separate institution was also considered. After more detailed investigations it was found out that a separate institution would have become essentially more expensive than the prevailing model of administration and the idea was abandoned. These thoughts, first concealed from the larger Oodi community, quite quickly started a widespread discussion on the various organisational

[6] Confidential report delivered to the first author, dated 8.12.2003.

levels of the Oodi Consortium in spring 2003, and the steering group made an inquiry of the prevailing opinions. This inquiry, reported in spring 2004, made obvious the various existing views of how the administration should be developed and how the activities should be led.

Over the years, conflicting views were expressed about the sharing of responsibilities between the operative groups and the consortium's project managers as well as conceptions of the significance of strategy in directing the operations of the consortium. Views on the functionality of Oodi also varied depending on the university and who was asked to comment on it in any given university. There were varying views on the division of Oodi into modules following the principles of enterprise resource planning, on the need for the university's own development work/bought work and on whether the operation was to be permanent or if Oodi was just a project. Oodi was experienced either as a strategic system or as a so-called traditional administrative system. There were also differing views on what the level of knowledge was when joining the consortium and what the capacity of an individual university was to cope with the general challenges of project activities.

In a way the conflicts can be characterised as differing world-views about IS project work between Oodi consortium personnel and some of the IT managers. The view of the consortium personnel was that important matters were keeping the personnel motivated in a complex and somewhat hostile context, and coping with uncertainty and equivocality (Daft and Lengel 1986). The view of the IT managers was expressed on many occasions and in documents. They insisted more exact planning of the development work, tight controls, and minimizing of the amount of time used for development group meetings. For example, the control point of view was expressed in a memorandum sent by an IT manager to the consortium steering group, dated 3.4.2002. He wrote: "*The English phrase 'to manage is to control is to measure' tells what it is all about*".

This tight control view materialised in the first few meetings of the Oodi working committee, elected 2003, where the attitude of this IT manager and his colleague towards Oodi project managers could be described as very harsh. The reaction from the consortium personnel side was expressed in an E-mail message sent by the consortium director (the first author) to the chairman of the Oodi working committee:

> *The project managers do not participate in the (next) meeting, but I introduce the items. Two previous meetings [27.1.2004, 11.3.2004] of the working committee have been such that there is no use of the project managers to be present.*

The views of the consortium personnel were discussed in many occasions. The first author recorded them as follows in his plenary presentation in KISS04-seminar in Kilpisjarvi (30.3.2004) about the state and future of Oodi, special item being the tension between the working committee and the consortium personnel: "*Working committee seems to think that consortium personnel [are] incompetent in project planning/work but is not able or willing to articulate its view of how to improve. Consortium personnel/director thinks that the key characters of working*

committee suggest counterproductive methods to Oodi IS personnel management and motivation."

The first author also quoted the arguments presented by some IT managers in spring 2003 that indicated that Oodi development was especially problematic. Counterarguments to the IT managers' views were also picked up by the first author from standard text-books (Laudon and Laudon 2002; Pfeffer and Sutton 2000; Davenport and Prusak 1998); according to these views Oodi development situation in 2003 and 2004 was in a good shape according to several indicators.

It is evident from the above that the reconciliation of these views would have been very difficult. The resolution began to come in summer 2004 when the post of Oodi consortium director was opened to be filled for 3 years, and the previous director (the first author) was not elected. After that the rest of the former Oodi development personnel gradually changed to other jobs.

5 Being a Boundary Spanner

In this section we outline some of the major issues that our boundary spanner experienced over the years. To be clear and to make it more readable we address of less detail and focus more on crucial issues. This part of the study presents the one novel contribution for IS field, a longitudinal analysis that identifies the essentials of boundary spanning in our case.

We have four different subcases when it comes to the encounters of a boundary role person. First, for Oodi, the skeleton contract cemented the relationship between the client and the vendor. Here the client consisted of many universities which complicated the relationship management. Crucial was conflict management, because the relationship dissolution was considered impossible. Second, for admissions, the client side was simple; only one university. The negotiation situation was also simpler, because there was no reason to take into account the views of other universities. Termination of the contract would have been possible, but was deemed to be a poor option. Instead of contract termination, external mediators were used for helping to solve the relationship problems. Third, for student mobility, the situation was framed such that the client could change the vendor in the middle of the work, as well as reorganizing the client side. Fourth, for the Oodi personnel reorganization, the consortium could change its boundary role person via an administrative fiat. The boundary role person had no possibility to resist this change.

5.1 Managing and Resolving Relationship Problems

For Oodi, our interpretation is that there were four different deep structures of the development process. The years 1995–1998 were those of optimistic development, years 1999 and 2000 were the emergence of the development crisis, year 2001 was

the resolution phase of the development crisis, and years 2002–2004 contained the era of reorganising.

Problems in the relationship became apparent in the spring of 1999. Two critical episodes (Storbacka et al. 1994) can be identified. The first one was the delivery of Oodi software for client testing. As described earlier, the delivery was several months behind the original schedule and the quality of the software was poor. The second episode in spring 1999 was identified in hindsight reflection by the author. This episode consisted of the signing of the admissions development contract in April 1999, and of an admission project board meeting in May 1999. At first sight, this should express trust between the parties, because the signed admissions contract included a clause that the client would get royalties if the vendor would succeed to sell the admission module to some other clients. However, there may have been other issues, too, as the text below indicates.

The client and the vendor expressed differing views about the immaterial rights of the admission module software. According to the client representative (the first author), it was agreed orally that the text of the contract would be discussed and refined in the next admission board meeting; the contract contained a clause that in the board meetings the parties could make changes to the contract. The issue arose because the client considered that the original contract was too restrictive in the immaterial property rights of the client, thus prohibiting the use of other vendors for the further development of the software. The minutes of the focal board meeting, written by the vendor representative, do not contain anything about the immaterial rights issue. The minutes contain additional errors: the meeting place is wrong as well as the list of participants. There exist two signed versions of the minutes, printed in September 1999 and January 2000.

The practice with the admission project minutes was that the vendor representative sent them via e-mail to participants and later obtained the signature of the client representative to the paper document. The signer of the client was a section chief who was responsible for the admissions. Of course it was the first author's fault that he first let the UH rector sign a dubious contract that was supposed to be refined soon after signing. The second fault was that he trusted that the vendor representatives had written the minutes correctly. In retrospect, this negligence may be seen as the outcome of an excessive workload: in addition to the tasks described in this paper, the author was also engaged in negotiations for a solution to a major conflict with a personnel IS vendor. (see also Tapio 2002).

It is impossible to reconstruct the "real" flow of the events of this episode. The first author did not make detailed notes in spring 1999, and the issue arose in autumn 2000, more than a year after the events. What have been recorded, are the reactions of the parties when they began to discuss this issue. The first reaction of the vendor representative (Patrick) by telephone was that "the signature counts and the client representative should be aware where he puts his name." In later actions the vendor tried to push its way vigorously, trying also to bypass the author by appealing to his superior.

The conflict was resolved for Oodi development after a meeting between the client and the vendor representatives in December 2000 (see also Heiskanen et al. 2008). This did not mean that the client was satisfied with the vendor's performance, but it was not so active any more in controlling the vendor. This entailed a move in the governance of the Oodi software improvements delivery. Earlier, each piece of delivery had a price tag that was negotiated in advance. This control was now relaxed and the vendor's personnel could bill by the hour. The rationale for this change was to lessen the administrative work of the project managers of both parties. For the admissions module, the signing of the maintenance and further development contract in April 2001 settled the intellectual property rights conflict through the inclusion of a standard contract text about the rights to the software. The contract was, however, only for 2 years, during which the client would decide how to continue. The contract was the outcome of several negotiations from autumn 2000 onwards. The resolution of the conflicts is perhaps best described as a meagre compromise.

5.2 Using Mediators in Order to Remove Assertive Behaviour

The beginning of negotiations about Oodi and admissions development problems in September 2000 opened the conflict between the client and the vendor for discussions. The first author's interpretation is that both sides began these negotiations with an assertive attitude (McCall and Warrington 1989). The first author also brought up the exit option during the negotiations. The assertive attitude of the vendor persisted for several months in autumn 2000 also regarding other issues. For example, when the client asked whether the vendor could send a copy of the admissions software for the client to inspect, the first reaction in e-mail was that the inspection should be in Joensuu in the vendor's premises, some 400 kilometres from Helsinki. The client perceived this as an attempt to make the inspection difficult for the consultant that was hired by the client for the inspection task. Quite soon the vendor changed its opinion and sent the software CD to the client.

In October 2000 the client hired an outside consultant (the same senior expert that was involved in the Oodi feasibility study) to mediate in the restoration of the client-vendor relationship. There was a real danger that the tension between Patrick and the first author would be a severe obstacle in resolving the relationship problems. Another option would have been to change these negotiators to other persons, but in practice this would have been difficult. The consultant delivered his report in mid November. This can be considered as the beginning of relationship improvement that continued in a meeting between Oodi consortium personnel and vendor representative (Charles) in mid December. The result of this meeting was that the client diminished the controls over the vendor (Heiskanen et al. 2008).

5.3 How to Reframe a Project When It Is Possible

The general view is that in customized IS development it is very difficult for the client to change the vendor. Sometimes the circumstances are different. This was the case in student mobility (Sect. 4.4), during the transition from StuMo to MoSu. The set of viable vendors (CSC, Ineo, Novo, Solenovo) were tested in earlier projects, and all of them were deemed as viable choices. The original vendors (Novo, Ineo) were a convenience choice for StuMo in early 2002 as they were the Oodi vendors at that time and had also activities with the FVU. The view of the client gradually changed during the MoSu bidding competition in early 2004 as the faults in specifications became evident and the losing vendors could not overcome this during the negotiations.

Reframing the student mobility work entailed also changes in the client organization. The two consortia (Oodi, FVU) were replaced with three piloting universities and one non-Oodi university. Also the leadership and management were transferred to Oulu University. The same kind of "simplification" happened also when the student admissions was organized as a project with KaTi and Helsinki University, excluding Oodi consortium. The guiding principle seems to be to keep the projects as simple as possible what comes to the number of participating organizations. In Oodi, the client orgnization was complicated by necessity, because a large set of client organizations was needed to cover the expenses.

5.4 Beyond Capabilities

The Oodi software needed quite a lot of money for perfective maintenance service purchases, as well as work-force from the personnel of the universities. For many Oodi universities it was very difficult to arrange these resources. They had allocated their resources based on the earlier estimates of how much the development would cost. Moreover, apparently the process became a political game between the consortium members who now tried to secure that they would get the features they needed in the system, without paying anything for those features that the other members needed. The first author perhaps became a scapegoat to be blamed for the excess spending for purchasing expensive services that were many times considered to be of poor quality. This all might have developed without the first author realising the importance of taking care of the political side of the Oodi process, which, for its turn, perhaps was an inherited way of behaving from his previous assignments in UH projects that were guided very straightforwardly in resource decisions.

A plausible interpretation of the Oodi history is that two broad issues conditioned the IS client- vendor relationship. The first issue was related to the poor capability of the vendor to deliver software as agreed on schedule and according to the estimated price. The second issue was the scarcity of resources of the Oodi universities as compared to the amount of work that was required for the implementation of a

system as large as Oodi. In concrete terms, the scarcity of resources manifested itself first in the many changes that were required to the delivered software. A lack of resources also delayed the beginning of the production use of Oodi in many universities. Moreover, the system was actually tested only in the production use. Proper project management methods were also lacking from many Oodi universities and therefore the members of these universities were unaware of the real progress of their own adoption projects. The scarcity of resources seemed to lead to frustration, which manifested sometimes in aggressive reactions.

The impression, like "weak signals," the first author got towards spring 2001 was that some of the Oodi universities were dissatisfied with the way he took care of the vendor relationship and how he managed the work of the consortium personnel. The official picture, however, was calm and harmonious if inferred from the Oodi rectors' meeting with the vendor executives in February 2001. Both the rectors and the executives seemed to be confident that the problems would eventually be resolved. In a way there seemed to prevail a curious combination of trust and distrust of the client community towards the first author. Distrust was present in those meetings and discussions that were held without direct contact with the author. Trust was shown, for example, in UH's loan to the consortium, as well as in the funding to the admissions module. A tentative explanation for this dual trust-distrust may be the changed nature of the Oodi development process. In 1996 a handful of IS managers were able to secure the funding of the Oodi project. The first delivery in 1999 showed that the original resource estimate for the programming phase was too low. The dissatisfaction eventually became public when a meeting for Oodi project reorganisation was held 15.5.2003 without vendor or Oodi consortium personnel representatives. This process led to the Oodi personnel changes, as described in Sect. 4.5.

The personnel reorganization was an issue that was beyond the control of the boundary role person, and thus different from the management of the relationship with the vendors. It is possible to speculate that, in addition to the distrust towards the first author as the consortium leader, his new post in Oulu University was considered to be a demerit, because he would have been able to work only as a part-time leader for the consortium. From his side, the plan was to increase the capacity and responsibility of project managers, thus making his capacity to be sufficient for both jobs.

We have in our earlier work (Heiskanen et al. 2000) noticed that developing several information systems with few resources for a dispersed user community can be very stressful. The same goes for Oodi. Fortunately, a search of the literature can help in dealing with the anxieties of practice. Hodgkinson (1983) suggest that it is wise to take a "stoic apathy" stance, or, in other words, exercise the art of indifference. Here indifference is to be understood in a special sense. It does not mean that one does not care, but a leader has to be concerned about human and organisational outcomes in which he has full or partial responsibility. What should be a matter of indifference is his own success or failure. Hodgkinson claims that the leader's ego has to cease to count and it has to be eliminated from the set of relevant variables. This is idealistic, and one can accomplish it only by approximation, by

constant effort and constant failure. But to conclude this section, the outcome of Oodi development in 2004 was deemed by the first author to be successful, because several standard text-book (Laudon and Laudon 2002) indicators support the conclusion that Oodi is in good shape: high rate of use, continuous development, local funding, promotion of key personnel, satisfied users, new organizational arrangements, stable maintenance funding and established user training. With hindsight, it was a proper time for the first author to move onto other tasks.

6 Discussion

As already said, this study revisits data from our earlier studies (e.g. Heiskanen et al. 2008). The aim of this article is to give a rich description and analysis of how the client-vendor relationships evolved over the years. Our research case is complicated by the fact that there are several software vendors and user organisations. The first author of this paper acted as a boundary role person or a boundary spanner (Adams 1976; Levina and Vaast 2005) between the client and vendor representatives. Levina and Vaast (2005) used practice-based view in order to understand boundary spanning in practice. Our motivation is to increase the understanding of the behavioural nuances of contractual IS development, seen and experienced from the inside. We have also shown the major issues that boundary spanner helped address in the projects. The research question addressed by our paper was as follows: *How outsourcing relationships are mastered from the boundary role person's point of view*?

In the previous section we outlined the major features of relationship management in our case. A reactive set of actions is related to the management and resolution of conflicts between the Oodi vendor and the client, including negotiations and the use of mediators. Proactive actions are used when the organization of the development work for student mobility is reframed. A "fatalistic" stance was adopted in the Oodi consortium personnel reorganization.

The analysis of client-vendor relationship as buyer-seller relationship is important as for example Lacity and Willcocks (1998) found that only one case of their sample of 45 outsourcing decisions was a strategic alliance. Many of their informants (IT/IS practitioners) considered their cases as strategic partnerships, although a more accurate characterisation would have been fee-for-services. The view of a strategic alliance (Applegate and Montealegre 1991; McFarlan and Nolan 1995) has somehow downplayed the simple fact that in many cases the IS client is only buying products and services and the vendor is selling them, without any real intent of forming an alliance or changing the boundaries of the firm (cf. Kern and Willcocks 2008). Even though the relationship between the IS vendor and client is fee-for-services, the characteristics of the relationship resemble those of a strategic partnership (Mohr and Spekman 1994).

It is understandable that the total history of the relationship development between the buyer client (UH) and the seller vendor (Novo, KaTi) follows the

suggestion of Klepper (1995) with the stages of awareness, exploration, expansion and commitment being evident when the preliminary IS histories before Oodi are taken into account. Previous IS development projects conditioned new ones. However, the special feature for Oodi was the rapidity of the growth of the strength of the bond between the parties, starting from September 1996 when the specification contract was signed. The skeleton contract signed in April 1997 cemented this relationship for 5 years. The cemented form of the contract was chosen on purpose, because it was anticipated that problems would appear. The contract enforced the parties to find solutions to the conflicts, instead of it ending as a relationship dissolution.

The appearance of visible problems of Oodi was delayed until spring 1999. At that time, the fifth stage of the model, dissolution of the relationship via legal procedures, was not perceived as a viable option by either party before both systems, Oodi and the admissions module, were functional. The client indicated the possibility of exit as early as October 2000. For Oodi, the exit would have been possible in spring 2002 according to the contract. For the admissions module, the exit would have been possible right away, but that would have left the client without a functioning system. Instead of exit, the client tried another strategy for Oodi, the introduction of other vendors. In student mobility the situation was different and the vendor change was easy.

Our case is an example of IS development project in which the bond between the client and the vendor became strong rapidly, which phenomenon is over-looked by Klepper (1995). Moreover, there can be a long passage of cooperative time before problems come visible (optimistic deep structure phase in 1995–1998 in Oodi case). This makes tailored IS procurement different from the buying of simpler things. Another finding of our case is that the performance and behaviour of the vendor may change from one project to another. The vendor behaviour in the auditorium reservation project, in the budgeting system bargaining and in the dental clinic system deconstruction, considered fair by the client, did not carry over to the problematic processes of Oodi and the admissions module. Thus the model presented by Klepper needs clarification, especially because Kern and Willcocks (2008, p. 49) criticise Klepper (1995) that he did not take into account contracting and its effect on the resulting relationship; another drawback is the neglect of the analysis of the evolution of management processes. Our case complements the analysis of Klepper as an investigation of how the real action sequences unfolded over the years. Our research data made it possible to list all the relevant events and outline which of them were crucial and conditioned the further actions of the participants. We have condensed our interpretation of the history in Table 2.

The position of the relationship manager (the first author in this case) towards the other party is conditioned by the relation this manager has with the parties within his or her own organisation. Adams (1976, p. 1178) puts it as follows:

> The BRP [Boundary Role Person] who bargains with external agency on behalf of his organisation must not only attempt to reach agreement with outsiders, but must also obtain agreement from his own group as to what constitutes an acceptable agreement.

Table 2 The most important events situated in a timeline over the years

Early 1990s	Auditorium reservation system development and budgeting system negotiations make a positive impression of Novo and KaTi towards the client
1995	Oodi consortium is founded. Oodi feasibility study is started
1996	Oodi feasibility study is completed. Oodi specification project started with Novo and KaTi
	Dental clinic system contract is signed between Helsinki University and Novo
1997	Oodi specification project is completed. Software tool is selected (Uniface) for Oodi development. Oodi planning phase is started. Problems with dental clinic system
1998	Admission system development contract signed with KaTi. Dental clinic contract cancelled; vendor behaviour was considered fair by the client, giving credibility to the vendor (Novo)
1999	First version of Oodi is delivered, lot of problems
	Admission system programming contract is signed between Helsinki University and KaTi. Admission system was planned to be used in summer for student elections, but this must be postponed
2000	Oodi is in production use in Helsinki and Lappeenranta; lot of problems. Oodi consortium takes a loan from Helsinki University in order to speed up the finalising of the software. Admission system is in use, difficulties but student elections can be handled
2001	First successful Oodi adoption; the software is now in fair shape. Scarcity of money in Oodi consortium is planned to be corrected via cooperation with the Virtual University. Oodi vendor re-selection via a bidding competition; the choice is Novo (including KaTi), Ineo and Solenovo. Admission system is in fair shape and a new maintenance contract settles the immaterial property rights dispute
2002	Cooperation between Oodi consortium and the Virtual University begins in order to develop a system to support student mobility between universities. Novo and Ineo are the vendors
2003	Student mobility system project is reorganised. Oulu University takes the leadership and a bidding competition is arranged in order to choose the software vendor
2004	Solenovo with CSC is chosen to be the software vendor for student mobility system. The project proceeds smoothly until 2006 and the system is developed without problems

Adams continues his analysis by pointing out that BRPs may have to settle for transaction outcomes that are less than optimal. This can be seen as if the BRPs are opponents towards their own organisation and closer to the external organisation. Their loyalty may be suspected. This general finding was confirmed by the first author several times also in our case, directly and from second-hand sources. The direct evidence came, for example, from an e-mail conversation with an Oodi university vice-rector who in spring 2000 suspected that the first author did not vigorously control enough that the vendor would deliver what his university wished. According to second-hand information, rectors or vice rectors of some

Oodi universities as well as other administrators had several discussions about the problems with the project.

The first author retained his boundary role position throughout the Oodi and admissions development process 1995–2001, and so did the vendor boundary role person Patrick. This permanence is understandable, because their main roles were as contractual negotiators. When it comes to the transfer of substantive matters over the organisational client-vendor boundary, these affairs were handled first for Oodi in the project group and later in a group where user representatives were the dominant party. It is interesting to compare our case with the findings of Levina and Vaast (2005) and Levina and Orlikowski (2009) about the cooperative efforts between Eserve and Pubco (names are fictional pseudonyms). Eserve, a fast growing professional services firm of business to consumer applications, was contracted to develop a modern internet based integrated system for Pubco, a publishing company. In a comparably short period, less than a year, there were many changes in the location and identity of the boundary role persons, and so did the power relationships between and within the parties also change. It has been also outlined by Ravishankar and Pan (2006) that the results of client-vendor relationship and identity development are not clear. According to them, even in "market" relationship, vendor personnel at times take on the client's identity.

The same change phenomenon of the location of boundary role persons have been found elsewhere. For example, in the early 1990s Heiskanen and Similä (1992) noticed that administrative gatekeeping by managers between vendor and client in IS development (e.g. in contractual issues between the parties) was replaced by substantive gatekeeping by IS analysts and user representatives (e.g. in how the software functionality was defined and developed). Neither Levina and Vaast (2005) nor Levina and Orlikowski (2009) elaborate the contractual issues between Pubco and Eserve, so it remains unknown what the role of contractual boundary spanners was in their case, and how the contract or contracts conditioned cooperation. It is generally known that when a piece of software is contracted with a fixed price, the vendor gatekeeper has a strong motivation to take care that the delivery content is as minimal as possible, and the client gate-keeper has the opposite motivation to see that all possible extra features are included. When the work is billed by the hour, the roles of the gatekeepers are reversed: the vendor has a motivation for extra work and billing, and the client gatekeeper must see that only necessary features are delivered and paid for by the client.

The basic generative mechanism, the motor that kept the Oodi, admissions and mobility software development running (Pentland 1999), was obvious, even trivial: the phases and tasks that were required for the project deliverables. Oodi and admissions projects were initiated when the need to replace the outdated systems with new ones was considered urgent. When problems appeared, the management needed to act in order to resolve them via chosen action strategies. The tension between the client and the vendor accumulated, leading in a crisis-like situation in autumn 2000. For Oodi, the final crisis resolution came in spring 2001. The major indication of eventual success was the non-problematic adoption in the Helsinki Business School. Before that, the client-vendor relationship needed to be restored

by the adoption of time-box administration that shows that client was willing to trust that the vendor will deliver the software as needed (Heiskanen et al. 2008). For the admissions module, the intensive negotiations between the parties as well as software improvements eventually resolved the problems for summer 2001 admissions. By the end of 2001 the relationship between the client and the vendor had calmed down to a "normal" state in IS outsourcing. It is possible to speculate that the hardship with Oodi and admissions software are rather normal phenomena in tailored software development, experienced also in other contexts. The parties of our case tried to find how to cooperate, because neither of them was willing to dissolve the relationship. Therefore, although they were bound together in a fee-for-services relationship, they used the same kind of actions that are used in managing strategic alliances. Using the terms of Alajoutsijärvi et al. (2000) for the conflict management, we could say that as the exit strategy was considered infeasible the strategy of the parties was to use voice, i.e. negotiate how to resolve problems and continue work.

Our case analysis can be seen also as an attempt by the first author as a boundary role person to cope with the negative emotions that arose via the conflicts with the vendor and user representatives. It is an attempt to turn the experience into learning. This is in line with Antonacopoulou and Yiannis (2001) who maintain that emotions and learning are important for individuals and organisations, and should be studied together. We also highlight, like Bunderson and Reagans (2010), that it is important to investigate how power and status can affect learning related processes and outcomes.

In IS research, McGrath (2006) writes that limiting human agency to its cognitive dimensions makes it is impossible to consider the totality of human capacities engaged with IS innovation processes. She continues by claiming that the research in the IS field ignores the emotional behaviour through which we are engaged in IS development and use, and the organisational change introduced by a novel IS. She also argues that emotions are always implicated in our experiences, influencing our beliefs of what is good or bad, right or wrong.

Our case adds a longitudinal analysis to the literature that investigates the nuances of acting as a boundary spanner, as seen from the inside. In the introduction we set as the task of this article to give a rich picture of how the client-vendor relationship evolved over the years. Our main message is to encourage other IS practitioners to analyse their own experiences through theorising out of their IS development projects, perhaps in a retrospective way (cf. Gummesson 2000). When it comes to obtaining data through research interviews, the first author has considered it unethical and infeasible because of the dual role of the practitioner/researcher. The interviews could have implied that the first author was taking undue advantage of his dual role, aggrandising himself improperly and intimidating the interviewees by giving "scientific" backing to his practical acts. In the same way, direct observations have been possible only when they occur as a part of the practitioner's role. As narratives, the histories are told from the viewpoint of the first author in his dual practitioner and researcher role. This is in line with the suggestion by Pentland (1999) who maintains that every story is told

from a particular point of view, with a particular narrative voice. Pentland continues that stories vary depending who is doing the telling. If stories change depending who is telling them, this raises questions about truth. The stories are told here as they can be inferred from project documents. Lacity et al. (2009) have suggested to use qualitative methods in outsourcing studies as they help researchers to understand for example why some factors are important and how relational governance develops over time. We have attempted this in our description and analysis.

This case supports the finding that contractual IS development is typically done in a fee-for-services basis, but the parties are in a relationship that resembles a strategic alliance, because the switching costs are so high for the client and the vendor obviously considers the projects profitable. This strong bond demands patience in clearing relationship problems. Even though the client may try to keep the costs reasonable through competitive arrangements, quite soon during an IS development project the client is tied to the chosen vendor, although the student mobility project provides a counter example. Moreover, it is not possible to specify every contingency in a closed contract over a long period of time (Richmond et al. 1992; McFarlan and Nolan 1995, p. 17; Kern and Willcocks 2008). Negotiations and re-negotiations fill the void that emerges out of any incomplete contracting issues. It is also easy to identify that many of the determinants of the commitment to projects mentioned by Newman and Sabherwal (1996) were valid also in our case. For example, both Oodi and admissions projects had large closing costs, decision makers felt emotional attachment to them and personal responsibility for them, and were identified with the project, and the projects were of a strategic nature and supported by the top management. The first author also perceived the negative Oodi publicity in Lappeenranta as a motivator to continue the work for a successful outcome for Oodi and admissions software development, as well as towards the clearance of the problems in the client-vendor relationship.

Should the development project succeed, typically the vendor continues as a maintenance provider. This relationship, which may be long, may last until the client organises a new process to replace the current IS with a new one, and perhaps changes the vendor via a bidding competition. Our case provides an example where this strong bonding was recognised from the outset: the major contract for Oodi delivery was written in such a way that it was very difficult for the partners to divorce from this cooperative effort within the base period of 5 years. The motive was to compel the parties to continue together and resolve conflicts that would inevitably arise in the course of the development of the IS of this size and complexity. The authors suggest that the contract structure may strengthen the partners' relationships. However, this is not explored in systematic way in IS journals. We agree that relations do not always strengthen after conflicts and it might go both ways. This is why we suggest that researchers should focus more on these underlying mechanisms which help to strengthen relationships.

7 Conclusion

This longitudinal, qualitative case study presents rich description and analysis of how the client-vendor relationships evolved from the early 1990s until 2004 in a very complicated setting. This research was unique from two perspectives: Firstly, longitudinal studies of IS projects are rare because it is often difficult to study complete information system projects from beginning to the end (Allen 2003)—our empirical data consists seven interlinked development processes, the most interesting era being from 1999 to 2004. Six of the development processes are about software development and the seventh is about personnel reorganising. Secondly, this study had a unique approach/contribution: we use a practice-based view in order to understand boundary spanning. This study makes a unique contribution to IS studies using the analysis of the chief information system officer of the university (1990–2000), who later acted as a contracted leader for Oodi (2001–2004) and student mobility project (2002–2006). He acted as a boundary role person between the client and the vendor during these years.

We have demonstrated in this study, for example, why it is important to consider contractual issues between the organisations under investigation as the contract defines the framework under which the various organisational and occupational groups find the arenas of interaction. One of our key finding is that the contract structure may strengthen the partners' relationship in IS project. We also urge other IS practitioners to analyse their own experiences through theorizing out of their information system development projects. We believe that it is reasonable to suppose that the retrospective analysis has benefited from the long time scale.

References

Adams, J. S. (1976). The structure and dynamics of behavior in organizational boundary roles. In M. D. Dunnette (Ed.), *Handbook of organisational and industrial psychology* (pp. 1175–1199). Chicago: McNally.

Alajoutsijärvi, K., Möller, K., & Tähtinen, J. (2000). Beautiful exit: How to leave your business Partner. *European Journal of Marketing, 34*(11/12), 1270–1289.

Allen, D. K. (2003). Organisational climate and strategic change in higher education: Organisational insecurity. *Higher Education, 46*(1), 61–92.

Anderson, L. (2006). Analytic autoethnography. *Journal of Contemporary Ethnography, 35*(4), 373–395.

Antonacopoulou, E. P., & Yiannis, G. (2001). Emotion, learning and organisational change. *Journal of Organisational Change Management, 14*(5), 435–451.

Applegate, L. & Montealegre, R. (1991). *Eastman Kodak Company: Managing information systems through strategic alliances*. Case 9-192-030. Boston: Harvard Business School.

Bakos, J. Y., & Brynjolfsson, E. (1993). Information technology, incentives and the optimal number of suppliers. *Journal of Management Information Systems, 10*, 37–53.

Barki, H., & Hartwick, J. (2001). Interpersonal conflict and its management in information systems development. *MIS Quarterly, 25*(2), 195–228.

Barley, S. (1990). Images of imagining: Notes on doing longitudinal field work. *Organization Science, 1*(3), 220–247.

Batonda, G., & Perry, C. (2003). Approaches to relationship development processes in inter-firm networks. *European Journal of Marketing, 37*(10), 1457–1484.

Beath, C. M. (1983). Strategies for managing MIS projects: At transaction cost approach. *Proceedings of the Fourth International Conference on Information Systems* (pp. 133–147), Houston, Texas, 1983.

Beath, C. M. (1987) Managing the user relationship in information systems evelopment projects: A transaction governance approach. *Proceedings of the Eight International Conference on Information Systems* (pp. 415–427), Pittsburgh, Pennsylvania, 1987.

Boyle, M., & Parry, K. (2007). Telling the whole story: The case for organizational autoethnography. *Culture and Organization, 13*(3), 185–190.

Bunderson, J. S. & Reagans, R. E. (2010). Power, Status, and Learning in Organizations. *Organization Science*, *22*(5), 1182–1194.

Christopher, M., Payne, A., & Ballantyne, D. (1993). *Relationship marketing*. Oxford: Butterworth- Heinemann.

Coghlan, D., & Brannick, T. (2002). *Doing action research in your own organization*. London: Sage Publications.

Cong, Q. & Chau, P. Y. K. (2007). Does interpersonalttrust also matter? Exploring the role of trust in successful IT outsourcing. *Proceedings of the 40th Hawaii International Conference on System Sciences*.

Copeland, D. G., & McKenney, J. L. (1988). Airline reservations systems: Lessons from history. *MIS Quarterly, 12*, 353–370.

Daft, R. L., & Lengel, R. H. (1986). Organizational information requirements, media richness and structural design. *Management Science, 32*(5), 554–571.

Das, T. K., & Teng, B. (1998). Between trust and control: Developing confidence in partner cooperation in alliances. *Academy of Management Review, 23*(3), 491–512.

Das, T. K., & Teng, B. (2001). Trust, control, and risk in strategic alliances: An integrated framework. *Organization Studies, 22*(2), 251–283.

Davenport, T. H., & Prusak, L. (1998). *Working knowledge: How organizations manage what they know*. Boston, MA: Harvard Business School Press.

Dwyer, F. R., Schurr, P. H., & Oh, S. (1987). Developing buyer-seller relationships. *Journal of Marketing, 51*, 11–27.

Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review, 14*(4), 532–550.

Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *Academy of Management Journal, 50*(1), 25–32.

Eklin, M. (2005). Tietojärjestelmäkehitys sosio-teknisenä prosessimallina, tapaustutkimus Oodi-tietojärjestelmästä (Information system development as socio-technical process model, the case of Oodi information system). Unpublished master's thesis. Helsinki School of Economics and Business Administration.

Feeny, D. F., & Willcocks, L. P. (1998). Redesigning the IS function around core capabilities. *Long Range Planning, 31*(3), 354–367.

Fitzgerald, G., & Russo, N. L. (2005). The turnaround of the London Ambulance Service Computer-Aided Despatch System (LASCAD). *European Journal of Information Systems, 14*, 244–257.

Gallivan, M. J., & Depledge, G. (2003). Trust, control and the role of interorganizational systems in electronic partnerships. *Information Systems Journal, 13*, 159–190.

Gonzalez, R., Gasso, J., & Llopis, J. (2009). Information system outsourcing reasons and risks: An empirical study. *International Journal of Human and Social Sciences, 4*(3), 181–192.

Griffith, T. L., & Northcraft, G. B. (1996). Cognitive elements in the implementation of new technology: Can less information provide more benefits? *MIS Quarterly, 20*(1), 99–110.

Gummesson, E. (2000). *Qualitative methods in management research*. London: SAGE Publications.

Gurbaxani, V., & Whang, S. (1991). The impact of information systems on organizations and markets. *Communications of the ACM, 34*(1), 59–73.

Heiskanen, A. (1994). *Issues and factors affecting the success and failure of a student record system development process*, *A longitudinal investigation based on reflection-in-action.* Doctoral Dissertation at the University of Tampere, The University of Helsinki.

Heiskanen, A. (1995). Reflecting over a practice: Framing issues for scholar understanding. *Information Technology and People, 8*(4), 3–18.

Heiskanen, A. & Newman, M. (1997). Bridging the gap between information systems research and practice: The reflective practitioner as a researcher. In K. Kumar, & J. I. DeGross (Eds.), *Proceedings of the Eighteenth International Conference on Information Systems*, *Atlanta*, *Georgia* (pp. 121–131), December 15–17, 1997.

Heiskanen, A. & Newman, M. (1998). The dynamics of IS procurement, case study of a budgeting and financial reporting system. In Baets, W. R. J. (Ed.) *Proceedings of the 6th European Conference on Information Systems*, *Aix-En-Provence* (pp. 839-852), June 3-6 1998.

Heiskanen, A., Newman, M & Saarinen, V. (1998). Innovations in fiefdoms: Developing a common student information system in six Finnish universities. In T. J. Larsen, L. Levine, & J. I. DeGross (Eds.), *Proceedings of the IFIP Working Groups 8.2 and 8.6 Joint Working Conference*, *Helsinki* (pp. 455–469), December 10–13, 1998.

Heiskanen, A., Newman, M. & Similä, J. (1996).Software contracting: A process model approach. In J. I. DeGross, S. Jarvenpaa, & A. Srinivasan (Eds.), *Proceedings of the Seventeenth International Conference on Information Systems*, *Ohio*, *USA* (pp. 51–62), 1996.

Heiskanen, A., Newman, M., & Similä, J. (2000). The social dynamics of software development. *Accounting, Management and Information Technologies, 10*, 1–32.

Heiskanen, A., & Similä, J. (1992). Gatekeepers in the action structure of software contracting: A case study of the evolution of user-developer relationships. *ACM Computer Personnel, 14*(1 & 2), 30–44.

Heiskanen, A., Newman, M., & Eklin, M. (2008). Control, trust, power, and the dynamics of information system outsourcing relationships: A process study of contractual software development. *Journal of Strategic Information Systems, 17*, 268–286.

Hodgkinson, C. (1983). *The philosophy of leadership*. New York: St Martin's Press.

Jasperson, J., Carte, T. A., Saunders, C. S., Butler, B. S., Croes, H. J. P., & Zheng, W. (2002). Review: Power and information technology research: A metatriangulation review. *MIS Quarterly, 26*(4), 397–459.

Jehn, K. A., & Mannix, E. A. (2001). The dynamic nature of conflict: A longitudinal study of intragroup conflict and group performance. *Academy of Management Journal, 44*(2), 238–251.

Jokelin (2000). Riskienhallinta tietojärjestelmän käyttöönotossa (Risk management in information system adoption). Unpublished master's thesis, Lappeenranta University of Technology.

Keil, M., Tan, B. C. Y., Wei, K., Saarinen, T., Tuunainen, V., & Wassenaar, A. (2000). A cross-cultural study on escalation of commitment behavior in software projects. *MIS Quarterly, 24*, 299–324.

Kern, T., & Willcocks, L. (2000). Exploring information technology outsourcing relationships: Theory and practice. *Journal of Strategic Information Systems, 9*, 321–350.

Kern, T. & Willcocks, L. P. (2008). *The relationship advantage*: *Information technologies*, *sourcing*, *and management*. Oxford: Oxford University Press. (Reprint 2008, original printing 2001).

Kirsch, L. J. (1997). The management of complex tTasks in organizations: Controlling the systems development process. *Organization Science, 7*(1), 1–21.

Kirsch, L. J., Ko, D. G., & Haney, M. H. (2010). Investigating the antecedents of team-based clan control: Adding social capital as a predictor. *Organization Science, 21*(2), 469–489.

Klein, H. K., & Rowe, F. (2008). Marshalling the professional experience of doctoral students: A contribution to the practical relevance debate. *MIS Quarterly, 32*(4), 675–686.

Klepper, R. (1995). The management of partnering development in IS outsourcing. *Journal of Information Technology, 10*(4), 249–258.

Kotlarsky, J., & Oshri, I. (2005). Social ties, knowledge sharing and successful collaboration in globally distributed system development projects. *European Journal of Information Systems, 14*(1), 37–48.

Lacity, M. C., Khan, S. A., & Willcocks, L. P. (2009). A review of the IT outsourcing literature: insights for practice. *Journal of Strategic Information Systems, 18*(3), 130–146.

Lacity, M. C., & Willcocks, L. P. (1998). An empirical investigation of information technology sourcing practices: Lessons from experience. *MIS Quarterly, 22*(3), 363–408.

Lacity, M. C., Willcocks, L. P., & Feeny, D. F. (1996). The value of selective IT outsourcing. *Sloan Management Review, Spring, 1996*, 13–25.

Lacity, M. C. & Hirschheim, R. (1993). Information systems outsourcing: Myths, metaphors and realities, Wiley.

Laudon, K. C., & Laudon, J. P. (2002). *Management information systems—managing the digital firm* (7th ed.). Upper Saddle River, NJ: Prentice-Hall.

Levina, N. (2005). Collaborating on multiparty information systems development projects: A collective reflection-in-action view. *Information Systems Research, 16*(2), 109–130.

Levina, N., & Orlikowski, W. J. (2009). Understanding shifting power relations within and across organizations: A critical genre analysis. *Academy of Management Journal, 22*(4), 672–703.

Levina, N., & Vaast, E. (2005). The emergence of boundary spanning competence in practice: Implications for Implementation and use of information systems. *MIS Quarterly, 29*(2), 335–363.

Markus, M.L. & Robey, D. (1988). Information technology and organizational change: Causal structure in theory and research. *Management Science*, *34*(5), 583–598.

Mason, R. O., McKenney, J. L., & Copeland, D. G. (1997a). Developing an historical tradition in MIS research. *MIS Quarterly, 21*, 257–278.

Mason, R. O., McKenney, J. L., & Copeland, D. G. (1997b). An historical method for MIS research: Steps and assumptions. *MIS Quarterly, 21*, 307–320.

McCall, J. B., & Warrington, M. B. (1989). *Marketing by agreement*. Chichester: Wiley.

McEvily, B., Perrone, V. & Zaheer, A. (Eds.) (2003). Introduction to the special issue on trust in an organizational context. *Organization Science*, *14*(1), 1–4.

McFarlan, F. W., & Nolan, R. L. (1995). How to manage an IT outsourcing alliance. *Sloan Management Review, 36*(2), 9–23.

McGrath, K. (2006). Affection not affliction: The role of emotions in information systems and organisational change. *Information and Organisation, 16*, 277–303.

McKenney, J. L., Mason, R. O., & Copeland, D. G. (1997). Bank of America: The crest and trough of technological leadership. *MIS Quarterly, 21*, 321–353.

McWilliams, A. & Gray, S. R. (1995). Understanding quasi-integration. *The Journal of Business Strategies*, *12*(Spring), 69–85. http://coba.shsu.edu/jbs/vol12/no1/12-1-5.html.

Mohr, J., & Spekman, R. (1994). Characteristics of partnership success: Partnership attributes, communication behavior, and conflict resolution techniques. *Strategic Management Journal, 15*, 135–152.

Möllering, G. (2005). The trust/control duality: An integrative perspective on positive expectations of others. *International Sociology, 20*(3), 283–305.

Newman, M., & Sabherwal, R. (1996). Determinants of commitment to information systems development: A longitudinal investigation. *MIS Quarterly, 20*(1), 23–54.

Ngwenyama, O. K., & Bryson, N. (1999). Making the information systems outsourcing decision: A transaction cost approach to analyzing outsourcing decision problems. *European Journal of Operational Research, 115*(2), 351–367.

Nurmi, A., Hallikainen, P. & Rossi, M. (2008). Coordination of complex information system development projects: A case study of Finnish universities. In S. Rivard & B. A. Aubert (Eds.), *Advances in management information systems: Information technology outsourcing* (pp. 245–264). New York: M.E. Sharpe Inc

Pannirselvam, G. P., Love, M. S., & Madupalli, R. K. (2011). IT outsourcing: Culture/cohesion's impact on vendor performance. *International Journal of Business, Humanities and Technology, 1*(3), 266–278.

Panteli, N., & Sockalingam, S. (2005). Trust and conflict within virtual inter-organisational alliances: A framework for facilitating knowledge sharing. *Decision Support Systems, 39*(4), 599–617.

Pentland, B. T. (1999). Building process theory with narrative: From description to explanation. *Academy of Management Review, 24*(4), 711–724.

Pettigrew, A. (1972). Information control as a power resource. *Sociology, 6*(2), 187–204.

Pfeffer, J., & Sutton, R. I. (2000). *The knowing-doing gap: How smart companies turn knowledge into action*. Boston: Harvard Business School Press.

Puolanne E. (2007). Presentation by the consortium director at the Oodi-day. 17.10.2007.

Ravishankar, M. N., & Pan, S. K. (2006). The influence of organisational identification on organisational knowledge management. *International Journal of Management Science, 32*(2), 221–234.

Reed, M. I. (2001). Organization, trust and control: A realist analysis. *Organization Studies, 22*(2), 201–228.

Richmond, W. B., Seidmann, A., & Whinston, A. B. (1992). Incomplete contracting issues in information systems development outsourcing. *Decision Support Systems, 8*, 459–477.

Robey, D., Bourdeau, M. C., & Rose, G. M. (2000). Information technology and organisational learning: A review and assessment of research. *Accounting Management and Information Tecnologies, 10*(2), 125–155.

Robey, D., & Farrow, D. L. (1982). User involvement in information system development: A conflict model and empirical test. *Management Science, 28*, 73–85.

Robey, D., & Farrow, D. L. (1989). Group process and conflict in system development: A conflict model and empirical test. *Management Science, 35*, 1172–1191.

Robey, D., Smith, L. A., & Vijayasarathy, L. R. (1993). Perceptions of conflict and success in information system development projects. *Journal of Management Information System, 10*, 123–139.

Rustagi, S., King, W. R., & Kirsch, L. J. (2008). Predictors of formal control usage in IT outsourcing partnerships. *Information Systems Research, 19*(2), 126–143.

Saarinen, V. (2001). Kohti valtakunnallista opiskelijatietojärjestelmää – tapaustutkimus kuuden yliopiston yhteistyöstä (Towards nation-wide student records system—A case study of the cooperation of six universities). Unpublished master's thesis, Department of Information Processing Sciences, University of Oulu.

Sambamurthy, V. & Jarvenpaa, S. (2002). JSIS editorial—special issue on "Trust in the digital economy". *Journal of Strategic Information Systems*, *11*, 183–185.

Schultze, U. (2000). A confessional account of an ethnography about knowledge work. *MIS Quarterly, 24*(1), 3–41.

Schön, D. (1983). *The reflective practitioner, how professionals think in action*. New York: Basic Books.

Standish Group International, I. (2004). Chaos Demographics—2004 third quarter research report.

Storbacka, K., Strandvik, T., & Grönroos, C. (1994). Managing customer relationships for profit: The dynamics of relationship quality. *International Journal of Service Industry Management, 5*(5), 21–38.

Tapio, S. (2002) Heila-tietojärjestelmäprojekti ja sen ongelmat: Tutkimus Helsingin yliopiston henkilöstöhallinnon tietojärjestelmän kehitys- ja käyttöönottotyöstä asiakkaan näkökulmasta (The Heila information system development project and its problems: An investigation of the personnel administration system development and adoption work as seen by the client). Unpublished master's thesis, Depatrment of Education, University of Helsinki.

Whitten, D., & Wakefield, R. L. (2006). Measuring switching costs in IT outsourcing services. *Journal of Strategic Information Systems, 15*, 219–248.

Yin, R. K. (2003). Case study research: Design and methods (3rd ed., Vol. 5). Thousand Oaks, CA: Sage.

Managing Knowledge Transfer in Software-Maintenance Outsourcing Transitions: A System-Dynamics Perspective

Oliver Krancher and Jens Dibbern

Abstract The existing literature suggests that transitions in software-maintenance offshore outsourcing projects are prone to knowledge transfer blockades, i.e. situations in which the activities that would yield effective knowledge transfer do not occur, and that client management involvement is central to overcome them. However, the theoretical understanding of the knowledge transfer blockade is limited, and the reactive management behavior reported in case studies suggests that practitioners are frequently astonished by the dynamics that may give rise to the blockade. Drawing on recent research from offshore sourcing and reference theories, this study proposes a system dynamics framework to explain why knowledge transfer blockades emerge and how and why client management can overcome the blockade. The results suggest that blockades emerge from a vicious circle of weak learning due to cognitive overload of vendor staff and resulting negative ability attributions that result in reduced helping behavior and thus aggravate cognitive load. Client management may avoid these vicious circles by selecting vendor staff with strong prior related experience. Longer phases of coexistence of vendor staff and subject matter experts and high formal and clan controls may also mitigate vicious circles.

Keywords Outsourcing · Transition phase · Knowledge transfer · Knowledge management · System dynamics · Knowledge transfer blockade

O. Krancher (✉) · J. Dibbern
Institute of Information Systems, University of Bern, Engehaldenstr. 8,
3012 Bern, Switzerland
e-mail: oliver.krancher@iwi.unibe.ch

J. Dibbern
e-mail: jens.dibbern@iwi.unibe.ch

R. Hirschheim et al. (eds.), *Information Systems Outsourcing*, Progress in IS,
DOI 10.1007/978-3-662-43820-6_9

1 Introduction

Businesses continue to outsource software-maintenance work to offshore vendors given scarce domestic personnel and labor cost advantages in countries such as India (Oshri et al. 2011). Yet, many software-maintenance offshore outsourcing (SMOO) endeavors do not meet the initial expectations (Booth 2013; Dibbern et al. 2008; Gregory et al. 2009; Wende and Philip 2011). Ineffective knowledge transfer to vendor staff is a frequent source of failure, in particular when vast amounts of client-specific knowledge need to be transferred (Chua and Pan 2008; Dibbern et al. 2008; Oshri et al. 2011; Westner and Strahringer 2010). Knowledge transfer may be defined as the process (Szulanski 2000) through which vendor engineers acquire the task knowledge (i.e. the knowledge required to perform the software-maintenance tasks).

Knowledge transfer is particularly salient and critical during the transition phase (Chua and Pan 2008; Dibbern et al. 2008). This phase succeeds the contract signing and ends when the vendor team is able to take over delivery (Tiwari 2009). Vendors frequently send engineers to the client site during transition to help them acquire knowledge on the client's software applications, business processes, organizational structure, software-maintenance processes, and client-specific technologies (Chua and Pan 2008; Dibbern et al. 2008). They acquire knowledge by interacting with the client's subject matter experts (SME), by studying documents and software, and by working on software-maintenance tasks (Gregory et al. 2009; Krancher and Dibbern 2012; Nicholson and Sahay 2004). Yet, this learning process is frequently problematic. Case studies report that the engineers of the offshore unit were cognitively overloaded by the amount of client-specific information to be learned (Chua and Pan 2008; Krancher and Dibbern 2012). As a result of problematic knowledge transfer, the offshore teams may not be able to fully take over the tasks at the planned end of transition (Chua and Pan 2008), which may yield extra costs for knowledge transfer, specification, coordination, and control that offset the savings through labor cost advantages (Dibbern et al. 2008). Software-maintenance tasks may be particularly prone to problematic knowledge transfer because of the high cognitive demands that maintenance imposes on the individual engineer (Pennington 1987; Von Mayrhauser and Vans 1995) and because of the central role of domain-specific experience for maintenance productivity (Boh et al. 2007). Effectively managing knowledge transfer during transition may thus greatly contribute to the success of SMOO projects.

Recent research has improved our theoretical understanding of the mechanisms that may operate during knowledge transfer in SMOO transitions. Drawing on in-depth longitudinal data from five SMOO projects, Krancher and Dibbern (2012) found that the knowledge acquisition by vendor engineers could be well predicted by cognitive load theory (CLT) (Sweller et al. 1998; Van Merriënboer and Sweller 2005). In this perspective, the high cognitive demands that are frequently imposed on the engineers of the offshore unit (Chua and Pan 2008; Dibbern et al. 2008) impair not only their task performance, but also their learning, i.e. their improvement of task

performance over time. Stably high cognitive load (i.e. cognitive demands that the tasks impose on vendor engineers) may thus result in continuously low task performance unless remedies against high cognitive are provided. Two broad strategies may be effective remedies to regulate cognitive load: (1) help by the SME and (2) simple-to-complex sequencing of the tasks assigned to the vendor engineer (Krancher and Dibbern 2012). The need for these strategies may change over time. With increasing expertise, vendor engineers may perceive lower cognitive loads and therefore require less help or simple-to-complex sequencing.

While help and simple-to-complex sequencing may mitigate the cognitive loads on vendor engineers and thereby initially improve their learning, they may not materialize without management involvement given the high barriers imposed by cultural differences, language barriers, low familiarity with the SME, little prior related experience, and conflict (Dibbern et al. 2008; Gregory et al. 2009; Krancher and Slaughter 2013). Vendor engineers may initially exert only weak self-control of their learning process (Krancher and Slaughter 2013). This is because they may not be able to and may not dare to consult appropriate help or enforce simple-to-complex sequencing when their expertise is low and their relationships with SME lack trust (Krancher and Slaughter 2013). The control of learning activities may thus partially depend on outcomes of learning activities such as expertise and trust. This may give rise to complex dynamic interactions (Krancher and Slaughter 2013).

While learning and control may thus be subject to complex reciprocal interactions, client management is interested in favorably shaping these interactions. At least three client management decisions may affect the dynamics of learning and control. First, client management may or may not engage in vendor personnel selection to influence the initial expertise level of the staff assigned to the project. While managers frequently perceived staff selection as critical for the outcomes of outsourcing projects (Dibbern et al. 2008; Gregory et al. 2009), the theoretical understanding of the impact of staff selection is limited. Second, managers choose the amount of organizational controls related to knowledge transfer (Gregory et al. 2009; Krancher and Slaughter 2013). Evidence suggests that management may frequently fail to anticipate the need for controls, trusting in the self-control by the vendor (Dibbern et al. 2008; Gregory et al. 2009). Third, client management may decide on the duration of coexistence, the period during which the SME are assigned to the project to provide help to the vendor engineers. Whereas short coexistence periods risk prematurely interrupting knowledge transfer, long coexistence durations may jeopardize the business case of offshoring given the high cost rates of experts. Client management may frequently underestimate the need for coexistence and face unexpected costs for the SME involvement as a consequence (Dibbern et al. 2008). The reactive mode in which client management made and revised these decisions in the cases reported in the literature suggests that there is a practical need to understand how management decisions affect the dynamics in transitions. The study at hand aims at fulfilling this need by addressing the following question:

How do the client management decisions (1) on the involvement in staff selection, (2) on organizational controls, and (3) on coexistence duration impact transition outcomes in SMOO?

The question is addressed adopting the system dynamics paradigm (Forrester 1961). We propose a system dynamics model of learning and control during SMOO transitions based on prior case study results and reference theories. To ease understanding, we present three increasingly complex models and discuss how client management decisions impact the dynamics in these models and the resulting transition outcomes. The study contributes to knowledge transfer research by integrating theories of individual learning and control into a dynamic model and by proposing how learning and control may interact over time. We also provide practical implications for managing knowledge transfer in SMOO transitions.

2 A Dynamic Model of Learning and Control in SMOO Transitions

In this paper, a system-dynamics model of learning and control during SMOO transitions is developed from prior case study results and the literature. After a brief introduction into the system dynamics paradigm, three increasingly complex systems are modeled to explore and illustrate the dynamics in SMOO transitions.

2.1 The System Dynamics Paradigm

The system dynamics paradigm helps explore the dynamics that operate in complex systems by means of formal simulation (Forrester 1961). We chose system-dynamics simulation for two reasons. First, simulation is an effective tool for theory development when basic processes are known, but the interactions of these processes are vaguely understood (Davis et al. 2007). Prior case studies (Krancher and Dibbern 2012; Krancher and Slaughter 2013) gave insights into the basic processes of SMOO transitions. These include learning cognitively demanding tasks, which may be explained by CLT (Sweller et al. 1998), and controlling the support provided in this learning process, which may be explained by control theory (Kirsch 1996; Ouchi 1979) and attributional theory (Weiner 1985). While thus well-developed theory of the basic processes exists, the interactions of these processes have received little attention. Second, we chose the system dynamics paradigm because our case study results indicate that feedback loops (which we will describe in the next subsections) may operate. The system dynamics approach is a powerful tool for exploring the dynamics in feedback loops (Davis et al. 2007; Forrester 1987). The behavior of complex systems made up of multiple feedback loops is frequently difficult to grasp not because exogenous forces are unknown,

but because the interactions of the causal mechanisms endogenous to the system are too complex to be accessible to human intuition or cross-sectional data analysis (Forrester 1987; see also Van de Ven and Poole 1995 for similar claims, which, however, are not related to the system dynamics paradigm). In this view, interventions to a system by management or other stakeholders may often not result in the expected outcomes because the feedback mechanisms in complex systems are not taken into account (Forrester 1987). Prior studies have applied the paradigm to study dynamics in software projects (Abdel-Hamid and Madnick 1989), in organizational self-regulation (Rudolph and Repenning 2002), and in cognitive-load-based learning (Sawicka 2008).

In the following sections, three increasingly complex models of cognitive-load-based learning are developed. The models aim at predicting the learning process of a vendor engineer who is confronted with a series of learning tasks over 100 time periods (Krancher and Dibbern 2012; Van Merriënboer et al. 2003) and who may or may not benefit from support by the SME. This implies a focus on individual learning, which may be a foundation to group learning processes that may emerge at later stages of the project (Kim 1993; Nonaka 1994), but remain outside the scope of this study. The models thus simplify reality in assuming one vendor engineer and one SME.

2.2 *Model 1: A Simple Model of Cognitive-Load-Based Learning*

Figure 1 depicts a simple model of cognitive-load-based learning using the stock-and-flow notation. Table 1 lists the definitions of the variables in this and the subsequent models. The theoretical arguments behind the model and the stock-and-flow notation are explained next.

CLT theory assumes that humans learn by acquiring and refining schemas in their long-term memory (Kalyuga et al. 2003; Sweller et al. 1998; Van Merriënboer and Sweller 2005). Experts hold powerful schemas that enable them to make sense of the world within the domains of their expertise and to solve problems. Conversely, novices lack such schemas and are thus frequently overstrained by novel information and by problem-solving tasks. Learning is thus increase of expertise. CLT holds that the effectiveness of learning (i.e. the degree to which a setting allows learners to acquire or refine schemas) depends on the cognitive load on the learner. Learning is ineffective when tasks impose too high or too low cognitive loads on learners (Sweller et al. 1998; Van Merriënboer and Sweller 2005). When tasks impose high cognitive loads, the learners are overstrained by the complexity of the task and lack working-memory capacity to generalize from the concrete experience to schemas (Sweller et al. 1998; Van Merriënboer and Sweller 2005). Tasks that impose low cognitive loads do not bear significant learning opportunities because the learners may be largely familiar with the domain of the task (Schnotz and Kürschner 2007). Tasks that impose moderate cognitive load are therefore held

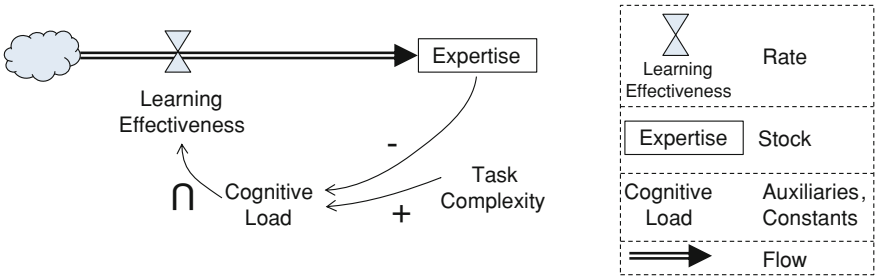


Fig. 1 Model 1: a simple model of cognitive-load-based learning

Table 1 Definitions of key terms

Ability trust The SME's beliefs in the ability of the vendor engineer (adapted from Mayer et al. 1995; McAllister 1995)
Coexistence The phase during which both the SME and the vendor engineers are assigned to the project
Cognitive load The cognitive demands that a maintenance task imposes on the cognitive system of the vendor engineer (Sweller et al. 1998)
Control The amount and intensity of actions to align the behavior of the SME and the vendor engineer with the client's knowledge transfer goals (adapted from Kirsch 1996)
Expertise The power of schemas in the vendor engineer's long-term memory that are related to the maintenance task (Sweller et al. 1998)
Help The amount of social help provided by the SME to the vendor engineer. This includes supportive information and the simplification of task types such as by the use of completion tasks or worked examples (Krancher and Dibbern 2012; Van Merriënboer et al. 2003)
Learning effectiveness The increase in expertise (Sweller et al. 1998)
Self-control The extent to which the vendor engineers engages in control related to her/his own learning
Support Help and simple-to-complex sequencing of tasks
Task complexity The component, coordinative, and dynamic complexity (Wood 1986) associated with a particular maintenance task such as a change request or a software defect
Transition duration The duration of the period after which the vendor engineer is able to deliver according to service levels

to be optimal for learning. The expertise of the learner and the complexity of the task are two main antecedents to cognitive load (Sweller et al. 1998; Van Merriënboer and Sweller 2005). These laws have been found useful to predict how vendor engineers acquire expertise when they work on a series of maintenance tasks during transition (Krancher and Dibbern 2012).

Figure 1 shows how these predictions can be formalized in a stock-and-flow diagram. The diagram shows expertise as a stock, learning effectiveness as a rate, and cognitive load and task complexity as auxiliaries and constants. Stocks are variables that have a memory (Forrester 1961; Sterman 2000). Their values may

increase or decrease over time based on flows. Conversely, the values of rates and auxiliaries are not a function of their values in prior periods. In model 1, expertise is a stock that may increase over time. Learning effectiveness is the rate that determines how strongly expertise increases. The flow that reflects the increases of expertise departs from a cloud symbol, indicating that there is a potentially endless source of expertise to be acquired as long as the inflow rate *learning effectiveness* permits it. In each period, learning effectiveness depends on cognitive load in an inverted-U-shaped relationship, i.e. moderate cognitive load yields the highest learning effectiveness while high and low loads result in weaker learning. The cognitive load at a particular time depends on the expertise at that time and task complexity. Consistent with prior system dynamics research, we assume a scale of 0 (very low) to 1 (very high) for rates, auxiliaries, constants, and the initial values of stocks. Some additional assumptions are needed to mathematically explore the behavior of this dynamic system. These assumptions are described in the Appendix.

Figure 2 shows the behavior of this model if a moderate constant value of task complexity (.4) and a low value of initial expertise (.1) are chosen. The low initial expertise leads to high cognitive load and, consequently, to low learning effectiveness. Due to low learning effectiveness, expertise initially increases only marginally over a sustained period of time. The intuition behind this is that the vendor engineer is overstrained by the demands of the tasks and lacks free mental resources to generalize from his experience to schemas that may ease subsequent task performance. Only after a considerable time of weak learning, expertise reaches levels that provide a significant relief in cognitive load, resulting in higher learning effectiveness. After the maximum of learning effectiveness is reached, further increases in expertise yield cognitive load below the optimal moderate level and, consequently, decreasing learning effectiveness. The resulting expertise curve is S-shaped in contrast to a concave curvilinear relationship frequently found in learning curve research (e.g. Kim et al. 2012; Morrison and Brantner 1992). The S shape emerges because of the period of initially weak learning due to high cognitive load under absence of help.

Although it may be insightful to observe the model dynamics, it is desirable to understand the outcomes of these dynamics. A central outcome of transitions is the transition duration, which we define as the period after which the vendor engineer is able to independently solve tasks to the satisfaction of the client. Because task performance is a dimension of cognitive load (Paas et al. 2003), we use cognitive load as an indicator of task performance in our model. High cognitive loads prevent engineers from conceiving effective solutions to maintenance problems within given solution timeframes. Conversely, low cognitive loads allow automated processing and yield effective solutions to maintenance problems within reasonable timeframes. We assume that the vendor engineer is able to solve tasks to the satisfaction of the client when cognitive load is below or equal to .5. The dotted blue arrows in Fig. 2 show that the vendor engineer has reached this state in period 69 of the simulation run. The input parameters of initial expertise = .1 and task complexity = .4 yield thus a relatively long transition duration of 69 periods because of a long initial period of tedious learning due to high cognitive load.

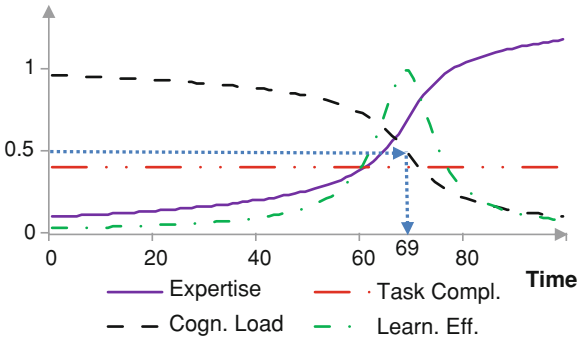


Fig. 2 Model 1 behavior (initial expertise = .1, task complexity = .4)

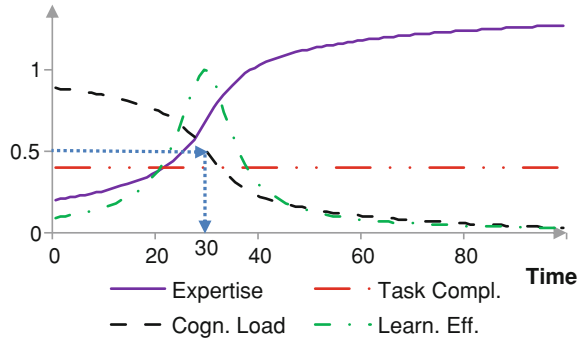


Fig. 3 Model 1 behavior (initial expertise = .2, task complexity = .4)

Model 1 gives an intuition on how initial expertise values may influence transition outcomes. Figures 3 and 4 show the evolutions of the model constructs with initial expertise levels that are slightly higher than in Fig. 2. In Fig. 3, a slightly higher initial expertise value of .2 (in contrast to .1 in Fig. 2) results in a substantially shorter transition duration of 30 periods. A still somewhat higher initial expertise value of .4 in Fig. 4 shortens the transition to 15 periods. In Fig. 3 and Fig. 4, the periods of effective learning starts substantially earlier than in Fig. 2. In essence, the curves are moved to the left, eliminating the tedious initial phase of weak learning. Selecting vendor engineers with prior experience in the domains of the task is a strategy that takes advantage of this effect. This initial analysis suggests that differences in initial experience may translate in a nonlinear relationship into better transition outcomes.

2.3 Model 2: A Model of Cognitive-Load-Based Learning and Static Support

Client management may want to avoid the situation illustrated in Fig. 2. Delivery outcomes will be poor when vendor engineers are constantly overloaded by the

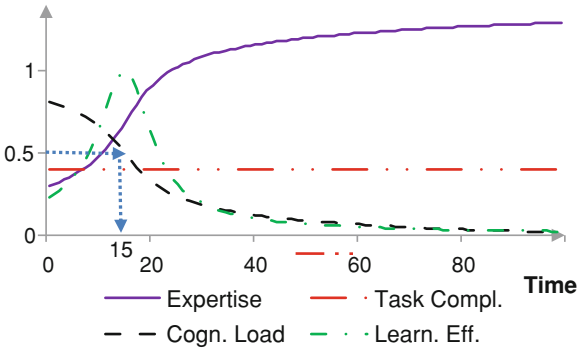


Fig. 4 Model 1 behavior (initial expertise = .3, task complexity = .4)

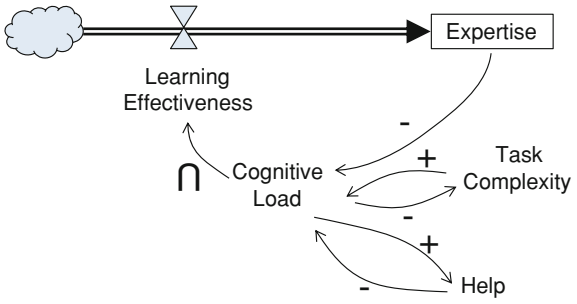


Fig. 5 Model 2: a model of cognitive-load-based learning and static support

demands of the tasks, and business departments may not be willing to wait for acceptable delivery results until period 69. This may be one major reason for the coexistence of vendor engineers and the SME during initial transitions. The SME may support the learning process of vendor engineers by two broad strategies: simple-to-complex sequencing and help (Krancher and Dibbern 2012; Van Merriënboer et al. 2003). Figure 5 shows model 2, which extends model 1 by including static support[1] through simple-to-complex sequencing and help. The model is explained next.

Model 2 assumes that task complexity is not constant, but is adjusted based on the simple-to-complex sequencing principle (Van Merriënboer et al. 2003). A client manager may purposefully assign a simpler maintenance request when she anticipates that a more complex task would put too high cognitive load on the engineer (Krancher and Dibbern 2012). Likewise, she may assign a more complex task when she expects that a simpler task would not bear significant learning opportunities because of too low cognitive load (Krancher and Dibbern 2012). Such behavior is reflected by the feedback loop between cognitive load and task complexity in model 2. In system-dynamics parlance, this is a negative or

[1] The qualifier *static* is used because the foundations that determine whether anticipated cognitive load results in support do not change over time.

balancing feedback loop (Sterman 2000) because the opposing signs of the two arrows contribute to a status of balance. It thus attenuates the impacts of otherwise unfavorably high or low task complexity on learning. A client manager may anticipate the cognitive load before simple-to-complex sequencing (i.e. the cognitive load in absence of simple-to-complex sequencing) based on the task complexity before simple-to-complex sequencing (i.e. the task complexity in absence of simple-to-complex sequencing) and expertise. He may therefore adjust the task complexity accordingly (task complexity after simple-to-complex sequencing) by assigning a different task.

Help is a second strategy to reduce cognitive load beyond simple-to-complex sequencing. Help may take the form of supportive information or simplified task types (Krancher and Dibbern 2012; Van Merriënboer et al. 2003). Examples of supportive information include formal presentations and informal conversations[2] on domain-related concepts such as the software architecture, application domain concepts, or the client's maintenance processes (Chua and Pan 2008). Supportive information can decrease cognitive load when it allows learners to link task-related information to higher-order concepts. Help may also be provided by simplifying task types. Task types are simplified when parts of the solution to a problem are provided or goal conditions are relaxed (Van Merriënboer et al. 2002). For instance, the SME may provide parts of the solution by creating a detailed design document (Dibbern et al. 2008). Help may result both from the proactive anticipation of the need for help based on cognitive-load concerns and from the reactive help seeking behavior of vendor engineers as a result of cognitive overload (Krancher and Dibbern 2012). Model 2 reflects both scenarios by assuming that help is a function of the cognitive load that would materialize if no help were provided. The more this cognitive load exceeds the optimal moderate level, the more help will be provided. The relationships between cognitive load and help are thus another negative or balancing feedback loop. Help thus attenuates the negative impacts of otherwise high cognitive loads on learning. In model 2, cognitive load is a function of three antecedents: expertise, task complexity (after simple-to-complex sequencing), and help. The additional assumptions made to explore the behavior of model 2 are given in the Appendix.

Figure 6 shows the behavior of model 2 assuming the same initial expertise value of .1 and the same task complexity before simple-to-complex sequencing of .4 as in Fig. 2. It is insightful to compare the paths in Fig. 6 (model 2) to the paths in Fig. 2 (model 1). The transition duration is shortened from 69 to 16. This is because simple-to-complex sequencing and help mitigate high cognitive loads. As a consequence of the simple-to-complex sequencing strategy, task complexity is initially lower and later on higher in Fig. 6 than in Fig. 2. Moreover, help is provided in function of cognitive load. As a result, cognitive load is initially lower

[2] Documents may be a further source of supportive information. However, the availability of documents may be to a lesser extent the result of dynamic processes in transitions. For reasons of parsimony, this paper therefore focuses on social help, leaving the influence of documents subject to future research.

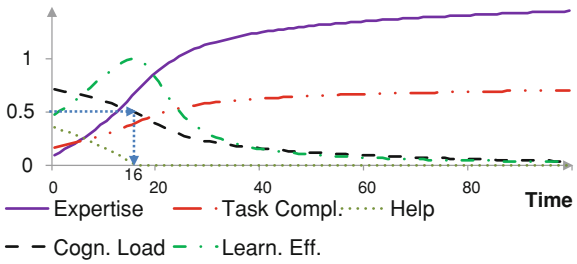


Fig. 6 Model 2 behavior (initial expertise = .1, task complexity before simple-to-complex sequencing = .4)

in Fig. 6 than in Fig. 2, resulting in higher learning effectiveness from the beginning. Also, the curtosis of the learning effectiveness curve is lower, which indicates longer periods of effective learning and yields higher expertise values. Taken together, the results are indicative of the benefits from support (i.e. simple-to-complex sequencing and help) during coexistence.

2.4 Model 3: A Model of Cognitive-Load-Based Learning and Dynamic Support

Although support may positively affect the vendor engineer's learning outcomes, it may be contingent on the willingness of the SME to provide the support and on the ability and willingness of the vendor engineer to make use of the support (Krancher and Slaughter 2013). Many context factors in SMOO may hinder constructive interaction between the vendor engineer and the SME, such as cultural distance, language barriers, conflict, low expertise of the vendor engineer, and low familiarity (Dibbern et al. 2008; Gregory et al. 2009; Krancher and Slaughter 2013). These barriers may be harmful for the vendor engineer's learning outcomes because they may impede the social interactions that would result in the required support (Gregory et al. 2009; Krancher and Slaughter 2013). This observation points the attention to the mechanisms that determine to what extent support is given.

While it is beyond the scope of this article to exhaustively theorize on barriers to knowledge sharing, it is within the scope to discuss how client management decisions and forces endogenous to the model impact support. Figure 7 shows model 3, which includes these antecedents to support. Consistent with the literature (Gregory et al. 2009; Krancher and Slaughter 2013), it suggests that control (Kirsch 1996) moderates whether too high (or too low) cognitive load results in task complexity adjustments or in help. Control has two formative elements: Formal and clan controls (FCC) (Kirsch 1996) and self-control by the vendor engineer. When control is weak, support will be lacking even if needed.

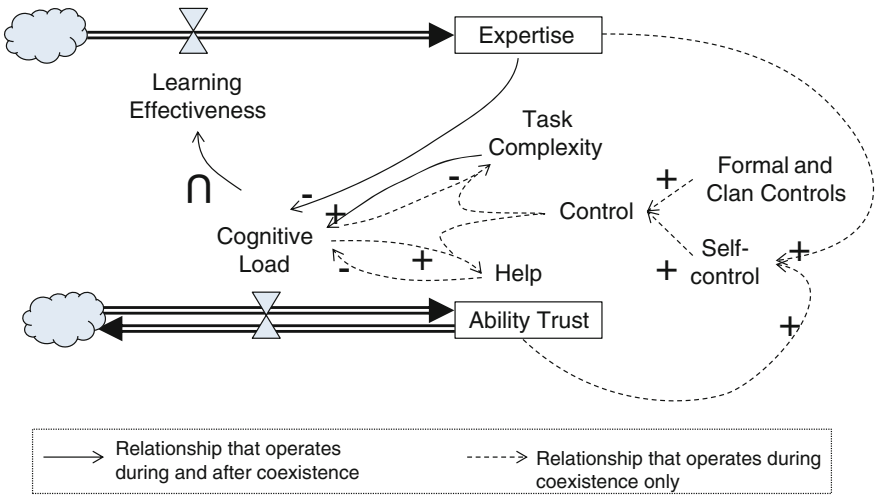


Fig. 7 Model 3: a model of cognitive-load-based learning and dynamic support

Conversely, when substantial control operates, help and task complexity adaption mitigate cognitive load. Whereas formal and clan controls are assumed to be exogenous to the model (i.e. management can choose them), self-control is endogenous. We explain this next.

Self-control may be a function of expertise and of ability trust (Krancher and Slaughter 2013). Expertise enables self-control because experts will have more free mental resources to reflect about the learning process and trigger appropriate corrective actions (Baumeister et al. 1998; Krancher and Slaughter 2013; Moos and Azevedo 2008). Ability trust may influence self-control for two reasons. First, when employees have high trust in the ability of a coworker, they are expected to help overloaded coworkers because they anticipate that their low performance may improve soon due to their high ability (Lepine and Van Dyne 2001; Weiner 1985). Conversely, when employees lack trust in the ability of a coworker, they are expected to cease supportive behavior because they do not expect any change in the performance of the coworker (Lepine and Van Dyne 2001; Weiner 1985). Second, vendor engineers may expect these judgments and refrain from seeking support when the relationship lacks trust (Krancher and Slaughter 2013). These theoretical arguments are reflected in model 3 as follows. Ability trust is included as a stock. It may thus increase or decrease over time. Cognitive load is the rate that determines inflows and outflows to ability trust. High cognitive load implies low task performance (Paas et al. 2003). Under repeatedly high cognitive loads and thus low task performance, the trust in the ability of the vendor engineer decreases (Mayer et al. 1995). In a similar vein, stably low cognitive load will be associated with strong task performance and will yield increases in ability trust.

Making some assumptions (see the Appendix) allows graphically exploring the behavior of the model. Figures 8 and 9 assume again initial expertise of .1 and task

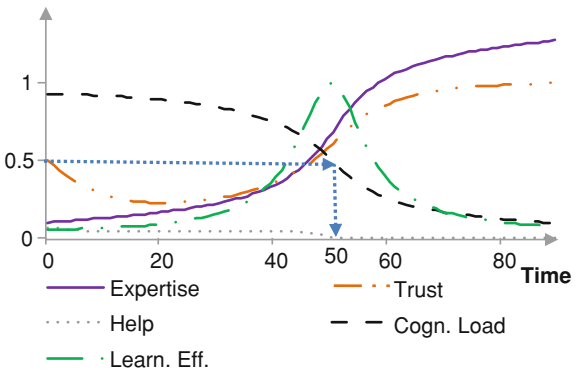


Fig. 8 Model 3 behavior (FCC = 0)

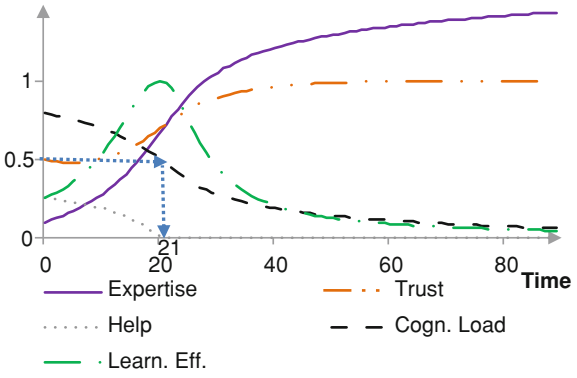


Fig. 9 Model 3 behavior (FCC = 1)

complexity before simple-to-complex sequencing of .4. Moreover, both graphs assume medium (.5) initial ability trust.[3] The only difference between the two figures lies in the amounts of FCC. Whereas no FCC (value of 0) are exerted in Fig. 8, very high FCC (value of 1) are in place in Fig. 9. The two scenarios yield different transition durations of 50 in Fig. 8 and 20 in Fig. 9. It is insightful to observe how the differences in control produce these different outcomes in the two examples. In Fig. 8, little help and little simple-to-complex sequencing (not shown in the graph) are initially provided. This is because FCC are absent and self-control is weak because of rather low trust and expertise. A very long period of weak learning can be observed. Also, ability trust decreases because the SME observes the outcomes of the vendor engineer's cognitive overload over a substantial period of time. Figure 9 shows a different picture. Here, high FCC can partially compensate for the initially weak self-control. As a result, more help and more simple-

[3] Trust may (or may not) initially be at a medium level when trust in the vendor organization cascades into trust in the individual engineer or when subject matter experts were involved into the selection of vendor personnel.

to-complex sequencing (not shown in the graph) are provided. This results in higher values of learning effectiveness from the beginning. Interestingly, improved learning outcomes also translate on the relational level. Because the SME observe higher task performance as a result of lower cognitive load, ability trust initially remains at medium levels and increases far earlier than in Fig. 8.

These observations indicate vicious and virtuous circles that may operate in SMOO transitions. When initial expertise is low and organizational controls are sparse (such as in Fig. 8), one may observe a vicious circle of low support, low learning effectiveness, decreasing ability trust, decreasing self-control (in response to lower trust), less support (in response to less self-control), and thus continuously weak learning. The negative effects of cognitive overload for learning outcomes (Sweller et al. 1998) and for ability attribution (Lepine and Van Dyne 2001; Weiner 1985) reinforce each other. Conversely, when high amounts of FCC are in place, support will be provided despite low self-control. This soon gives rise to a virtuous circle in which effective learning (due to moderate cognitive load) and positive ability attribution reinforce each other.

Model 3 is also useful to explore the role of the duration of the coexistence phase, i.e. the phase during which vendor engineers and SME coexist in the project. Coexistence and transition need not coincide. For instance, management may underestimate the need for training and therefore plan a brief coexistence phase, at the end of which, however, the vendor engineer has not yet acquired the expertise to independently process maintenance requests (i.e. the transition is not yet complete.). Alternatively, coexistence may also be longer than transition. For instance, vendor engineers may augment client teams. These SME will then coexist with the vendor engineers even after the vendor engineers are able to work independently.

Coexistence duration changes the predictions of model 3 in that simple-to-complex sequencing and help are accessible only during coexistence because only then will the SME be available as a source of support. This is reflected in Fig. 7. Whereas the relationships drawn by dashed arrows operate during coexistence only, the relationships indicated by the solid arrows operate both during and after coexistence. Figures 10 and 11 show two otherwise identical transitions (initial expertise = .1, task complexity = .5, FCC = .5) that only differ in the duration of the coexistence phase. Management planned the end of coexistence after 10 out of 100 periods in Fig. 10 (see the dashed line for the end of the coexistence phase). More time was given to the vendor engineer in Fig. 11, where coexistence ended after 30 periods. The differences between the two transitions are remarkable. In Fig. 10, the vendor engineer's learning process is disrupted at a stage during which she/he highly depends on simple-to-complex sequencing and help. Learning is only marginal after the end of coexistence due to very high cognitive load. This translates into a long transition duration of 86 periods. Conversely, the vendor engineer in Fig. 11 had gained more expertise when coexistence ended. He is therefore able to learn somewhat effectively after period 30 even though no

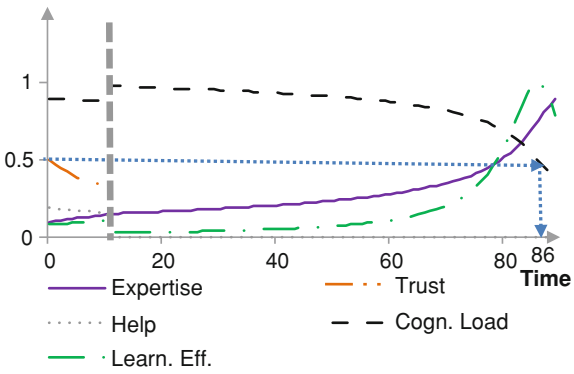


Fig. 10 Model 3 behavior (coexistence ends after 10 out of 100 periods (see *dashed line*))

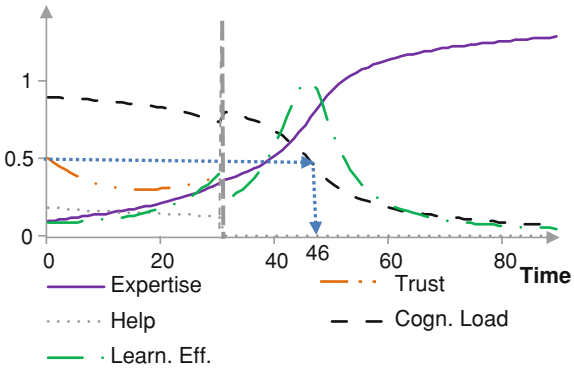


Fig. 11 Model 3 behavior (coexistence ends after 30 out of 100 periods (see *dashed line*))

support is provided any more. The resulting transition duration is 46 periods, which is substantially shorter. The observations suggest that coexistence durations may not be linearly related to transition outcomes.

3 Discussion

The goal of this paper was to explore how three client management decisions (the engagement in vendor staff selection to control their prior experience, the amount of FCC, and the duration of the coexistence phase) affect dynamics in learning and helping behavior in SMOO transitions. Applying the system dynamics paradigm to findings from previous research on SMOO and reference theories, three increasingly complex dynamic models of cognitive-load-based learning and control were developed and explored.

The exploration of models in the previous section indicates that the model is useful to illustrate how three management decisions impact the dynamics in SMO transitions and the resulting outcomes. A first management decision is whether

client management should engage in staff selection to control the initial expertise of vendor engineers. The model indicates that very low initial expertise values may give rise to long periods of tedious, ineffective learning, in which weak learning and decreasing ability trust due to high cognitive reinforce each other in a vicious circle. The selection of staff with appropriate skill sets may thus considerably shorten transition phases and save projects the extra costs caused by cognitively overloaded staff. A second management decision is whether client management should control knowledge transfer. Our results suggest that formal and clan controls initiated by management help compensate for initially weak self-control due to low expertise and trust. Formal and clan controls may thus also help attenuate or eliminate vicious circle of weak learning and decreasing trust that results in weak self-control and thus still higher cognitive load and weaker learning. A third management decision is how long SME should coexist with vendor engineers in the project. Our initial analysis indicates that premature ends of coexistence may disrupt learning and yield substantially longer transition duration. In contrast, ending coexistence at somewhat more advanced stages of the transition may be less problematic because vendor engineers may be more able to self-control their learning at these stages and may be less dependent on SME support.

The paper contributes to the knowledge transfer literature by suggesting explanations for how managerial interventions affect the dynamics in knowledge transfer and the resulting outcomes. We thus offer explanations for "knowledge transfer blockades" (Gregory et al. 2009, p. 1) that are grounded in the interaction of dynamic mechanisms over time. It also suggests new explanations for how and why client management may break knowledge transfer blockades. Awareness of the dynamics explored and illustrated in this paper could thus help practitioners avoid blockades and better manage SMOO transitions. The paper also contributes to the outsourcing literature by suggesting how learning theories, control theory, and attributional theory may be integrated with each other. Although this was not within the primary focus of the paper, the results may also have implications for the debate in the outsourcing literature on whether formal and informal controls are complements or substitutes (Choudhury and Sabherwal 2003; Goo et al. 2009; Gulati 1995; Poppo and Zenger 2002; Woolthuis et al. 2005). Our model adds to this literature by describing a new mechanism that may give rise to a complementary relationship. FCC directed to knowledge transfer may breed trust because they foster support and thus impede negative ability attribution due to cognitive overload (see Figs. 8 and 9). Increasing trust may then allow greater self-control. More FCC will thus be associated with more self-control.

At the current stage, however, the paper suffers from some limitations that may partially be healed in future work. First, few particular cases of combinations of model variable values have been examined in an illustrative manner. This allows limited inference on, for instance, how client management decisions may collectively impact dynamics in transitions. Although the results of the model runs indicate that some nonlinear relationships may operate, the analysis of the effects of management decisions has not yet been systematic. Second, the choices of parameters in the Appendix may raise the question to what extent the findings are

robust to alternative choices. Third, the dynamics in real transitions may be less predictable than suggested in the illustrations of the previous section. For instance, task complexity may vary randomly in function of the modification requests raised by users. Stochastic variation in task complexity may impact the dynamics in the model, e.g. when unusually simple tasks bear valuable learning opportunities for otherwise overloaded vendor engineers. We will conduct a Monte Carlo simulation to mitigate these limitations. A Monte Carlo simulation allows systematically manipulating the input parameters that reflect client management decisions. It also allows exploring to what extent the findings are robust to alternative model parameter choices.

Other limitations of the paper may not be addressed by adding a Monte Carlo simulation. First, the study does not make immediate use of empirical data, which may limit the external validity of the findings. Using new empirical data for validating the model propositions may mitigate this limitation. Second, the weights of the antecedents to cognitive load are based on results from nested case study data, which may be limited in their statistical generalizability. Future empirical research may help ascertain the effect sizes and thus provide a stronger basis for future simulations. Third, the study assumed that tasks are handed over from one SME to one vendor engineer. Although it may not be uncommon that one individual takes over the maintenance of a software application (Krancher and Dibbern 2012), group processes in vendor teams may impact the dynamics assumed in the model of this paper. Group processes are not taken into account in the model. Yet, a solid understanding of individual learning process may provide a fruitful base for theorizing on group learning. Fourth, the theorizing on the effects of FCC assumed that client manager may exert control into directions that support the learning of vendor engineers. This may only materialize when client managers are knowledgeable in the transformation process (Kirsch 1996), i.e. when they have knowledge about how people learn.

Acknowledgements This work has been financially supported by the Swiss National Science Foundation (SNSF) (Grant No. 100018_140407 /1).

Appendix: Model Assumptions

Assumptions in Model 1

The following assumptions are made in model 1:

A1: The values of all rates, auxiliaries, and constants and the start values of stock variables are within a range of 0 (very low) to 1 (very high).

A2: The regression coefficients reported in Krancher and Dibbern (2012) reflect the strengths of the relationships of cognitive load with its antecedents.

A3: The inverted-U-shaped relationship between cognitive load and learning effectiveness obeys the following functional form, where a is a parameter indicating the sensitivity to high or low cognitive loads and 0.5 is assumed to be the optimal level of cognitive load:

$$learning\ effectiveness = e^{-a\cdot(cognitive\ load-0.5)^2}$$

A4: The following integral function describes the evolution of expertise (ex) in function of time t, where b is a parameter for adjusting the scale between learning effectiveness and expertise (learning rate base value):

$$ex(t) = \int_{x=0}^{t} b \cdot learning\ effectiveness(x)\,\mathrm{dt}$$

A5: The vendor engineer is able to solve a task to the satisfaction of the client if the cognitive load is minor than or equal to .5.

A6: The following values have been chosen for the parameters: a = 16; b = 0.05.

Additional Assumptions in Model 2

Model 2 makes the following assumptions in addition to the assumptions made in model 1:

A7: Simple-to-complex sequencing adjusts task complexity so that cognitive load is closer to a medium level (0.5). Task complexity after simple-to-complex sequencing is therefore calculated as follows, where c indicates the magnitude of simple-to-complex sequencing:

$$\begin{aligned} task\ complexity_{afterSTCS} = {} & task\ complexity_{beforeSTCS} + c \cdot (.5 \\ & - cognitive\ load_{beforeSTCS}) \end{aligned}$$

A8: No help is provided if the cognitive load after simple-to-complex sequencing is below a medium level (0.5); else, help is calculated as follows, where d indicates the base line magnitude of help provided (help rate):

$$help = d \cdot (cognitive\ load_{afterSTCS} - .5)$$

A9: The following values have been chosen for the parameters c and d: c = .5; d = 1.

Additional Assumptions in Model 3

Model 3 makes the following assumptions in addition to the assumptions made in model 2:

A10: Control is the weighted sum of FCC and self-control, where f denotes the weight of self-control:

$$control = f \cdot selfcontrol + (1 - f) \cdot FCC$$

A11: Self-control is equally determined by expertise (ex) and ability trust:

$$selfcontrol = \frac{1}{2}(ex + abiltiy\,trust)$$

A12: Ability trust increases or decreases in function of cognitive load, where g denotes the sensitivity to latest cognitive load levels:

$$\begin{aligned} ability\,trust(t) =& (1 - g) \cdot ability\,trust(t - 1) \\ &+ g \cdot \max(0, \min(1, 2 - 2 \cdot cognitive\,load)) \end{aligned}$$

A13: The following values have been chosen for the parameters f and g: f = .5; g = .1.

References

Abdel-Hamid, T. K., & Madnick, S. E. (1989). Lessons learned from modeling the dynamics of software development. *Communications of the ACM, 32*(12), 1426–1438.

Baumeister, R. F., Bratslavsky, E., Muraven, M., & Tice, D. M. (1998). Ego depletion: Is the active self a limited resource? *Journal of Personality and Social Psychology, 74*, 1252–1265.

Boh, W. F., Slaughter, S. A., & Espinosa, J. A. (2007). Learning from experience in software development: A multilevel analysis. *Management Science, 53*(8), 1315–1331.

Booth, T. (2013). Here, there and everywhere—special report: Outsourcing and offshoring. *The Economist*. The Economist Newspaper Limited, pp. 2–16.

Choudhury, V., & Sabherwal, R. (2003). Portfolios of control in outsourced software development projects. *Information Systems Research, 14*(3), 291–314.

Chua, A., & Pan, S. (2008). Knowledge transfer and organizational learning in IS offshore sourcing. *Omega, 36*(2), 267–281.

Davis, J. P., Eisenhardt, K. M., & Bingham, C. B. (2007). Developing theory through simulation methods. *Academy of Management Review, 32*(2), 480–499.

Dibbern, J., Winkler, J., & Heinzl, A. (2008). Explaining variations in client extra costs between software projects offshored to India. *MIS Quarterly, 32*(2), 333–366.

Forrester, J. W. (1961). *Industrial dynamics*. Cambridge, MA: MIT Press.

Forrester, J. W. (1987). Lessons from system dynamics modeling. *System Dynamics Review, 3*(2), 136–149.

Goo, J., Kishore, R., Rao, H., & Nam, K. (2009). The role of service level agreements in relational management of information technology outsourcing: An empirical study. *MIS Quarterly, 33*(1), 8.

Gregory, R., Beck, R., & Prifling, M. (2009). Breaching the knowledge transfer blockade in it offshore outsourcing projects—a case from the financial services industry. *The 43th Hawaii International Conference on Systems Sciences*, Big Island, USA.

Gulati, R. (1995). Does familiarity breed trust? the implications of repeated ties for contractual choice in alliances. *Academy of Management Journal, 38*(1), 85–112.

Kalyuga, S., Ayres, P., Chandler, P., & Sweller, J. (2003). The expertise reversal effect. *Educational Psychologist, 38*(1), 23–31.

Kim, D. H. (1993). The link between individual and organizational learning. *Sloan Management Review, 35*(1), 37–50.

Kim, Y., Krishnan, R., & Argote, L. (2012). The learning curve of it knowledge workers in a computing call center. *Information Systems Research, 23*(3), 887–902.

Kirsch, L. (1996). The management of complex tasks in organizations: Controlling the systems development process. *Organization Science, 7*(1), 1–21.

Krancher, O., & Dibbern, J. (2012). Learning software-maintenance tasks in offshoring projects: A cognitive-load perspective. *The 33rd International Conference on Information Systems*. Orlando, USA.

Krancher, O., & Slaughter, S. (2013). Governing individual learning in the transition phase of software maintenance offshoring: A dynamic perspective. *The 46th Hawaii International Conference on System Sciences*. Maui, HI.

Lepine, J. A., & Van Dyne, L. (2001). Peer responses to low performers: An attributional model of helping in the context of groups. *Academy of Management Review, 26*(1), 67–84.

Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An integrative model of organizational trust. *Academy of Management Review, 20*(3), 709–734.

McAllister, D. J. (1995). Affect-and cognition-based trust as foundations for interpersonal cooperation in organizations. *Academy of Management Journal, 38*(1), 24–59.

Moos, D. C., & Azevedo, R. (2008). Self-regulated learning with hypermedia: The role of prior domain knowledge. *Contemporary Educational Psychology, 33*(2), 270–298.

Morrison, R. F., & Brantner, T. M. (1992). What enhances or inhibits learning a new job? A basic career issue. *Journal of Applied Psychology, 77*(6), 926.

Nicholson, B., & Sahay, S. (2004). Embedded knowledge and offshore software development. *Information and Organization, 14*(4), 329–365.

Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization Science, 5*(1), 14–37.

Oshri, I., Kotlarsky, J., & Willcocks, L. P. (2011). *The handbook of global outsourcing and offshoring*. Houndmills, United Kingdom: Palgrave MacMillan.

Ouchi, W. G. (1979). A conceptual framework for the design of organizational control mechanisms. *Management Science*, *25*(9), 833–848.

Paas, F., Tuovinen, J. E., Tabbers, H., & Van Gerven, P. W. M. (2003). Cognitive load measurement as a means to advance cognitive load theory. *Educational Psychologist, 38*(1), 63–71.

Pennington, N. (1987). Stimulus structures and mental representations in expert comprehension of computer programs. *Cognitive Psychology, 19*(3), 295–341.

Poppo, L., & Zenger, T. (2002). Do formal contracts and relational governance function as substitutes or complements? *Strategic Management Journal, 23*(8), 707–725.

Rudolph, J. W., & Repenning, N. P. (2002). Disaster dynamics: Understanding the role of quantity in organizational collapse. *Administrative Science Quarterly*, *47*(1), 1–30.

Sawicka, A. (2008). Dynamics of cognitive load theory: A model-based approach. *Computers in Human Behavior, 24*(3), 1041–1066.

Schnotz, W., & Kürschner, C. (2007). A reconsideration of cognitive load theory. *Educational Psychology Review, 19*(4), 469–508.

Sterman, J. D. (2000). *Business dynamics: Systems thinking and modeling for a complex world*. New York: Irwin/McGraw-Hill.

Sweller, J., Van Merrienboer, J. J. G., & Paas, F. G. W. C. (1998). Cognitive architecture and instructional design. *Educational Psychology Review, 10*(3), 251–296.

Szulanski, G. (2000). The process of knowledge transfer: A diachronic analysis of stickiness. *Organizational Behavior and Human Decision Processes, 82*(1), 9–27.

Tiwari, V. (2009). Transition during offshore outsourcing: A process model. *The 30th International Conference of Information Systems*, Phoenix, AZ.

Van de Ven, A. H., & Poole, M. S. (1995). Explaining development and change in organizations. *Academy of Management Review, 20*(3), 510–540.

Van Merriënboer, J. J. G., Clark, R. E., & De Croock, M. B. M. (2002). Blueprints for complex learning: The 4c/Id-model. *Educational Technology Research and Development, 50*(2), 39–64.

Van Merriënboer, J. J. G., Kirschner, P. A., & Kester, L. (2003). Taking the load off a learner's mind: Instructional design for complex learning. *Educational Psychologist, 38*(1), 5–13.

Van Merriënboer, J. J. G., & Sweller, J. (2005). Cognitive load theory and complex learning: Recent developments and future directions. *Educational Psychology Review, 17*(2), 147–177.

Von Mayrhauser, A., & Vans, A. M. (1995). Program comprehension during software maintenance and evolution. *Computer, 28*(8), 44–55.

Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review, 92*(4), 548.

Wende, E., & Philip, T. (2011). Instant messenger in offshore outsourced software development projects: Experiences from a case study. *The 44th Hawaii International Conference on System Sciences*, Koloa, HI.

Westner, M., & Strahringer, S. (2010). Determinants of success in IS offshoring projects: Results from an empirical study of German companies. *Information & Management, 47*(5), 291–299.

Wood, R. E. (1986). Task complexity: Definition of the construct. *Organizational Behavior and Human Decision Processes, 37*(1), 60–82.

Woolthuis, R. K., Hillebrand, B., & Nooteboom, B. (2005). Trust, contract and relationship development. *Organization Studies, 26*(6), 813–840.

Part IV
Multi-vendor and Multi-client Ecosystem Management

From Onshore to Offshore of IT Services Outsourcing: History of One Large Australian Organisation's Journey

Julie Fisher, Rudy Hirschheim, Robert Jacobs and Ashley Lazaro

Abstract IT outsourcing is common business practice and in recent years has moved to the use of offshore IT service companies. In 2008 we described the outsourcing approach of a large Australian company (Alpha Corporation) over a 10 year period (1997–2006) beginning with the initial decision to outsource in 1997. There are few studies which have documented outsourcing arrangements in as large a corporation as Alpha over such an extended period of time. Taking a historical perspective we briefly discuss the external factors relating to government policy which led to the initial changes in Alpha as the organisation moved from a public to a private company. The move to full privatisation was a key driver for decisions to outsource IT services. We explore from the perspective of external factors and internal IT changes, how Alpha's outsourcing arrangements matured from 2003 to 2011. The discussion includes the decision Alpha corporation took to engage IT services vendors in India and the impact these changes had on the outsourcing arrangements. Finally we reflect on the learning from this case study, including how the company dealt with the various outsourcing and offshore arrangements during a major company transformation.

Keywords Outsourcing · Offshore · IT services · Telecommunications

J. Fisher (✉)
Monash University, P. O. Box 197, Caulfield East, VIC 3145, Australia
e-mail: Julie.Fisher@Monash.edu

R. Hirschheim
Louisiana State University, 2221 Business Education Complex, Nicholson Extension, Baton Rouge, LA 70803, USA
e-mail: rudy@lsu.edu

R. Jacobs
Outsourcing Consultant, 68 Holmes Rd, Moonee Ponds, Melbourne, VIC 3039, Australia
e-mail: r.jacobs@bigpond.net.au

A. Lazaro
National Broadband Network Company (NBN Co), 535 Bourke St, Melbourne VIC 3000, Australia
e-mail: ashleylazaro@nbnco.com.au

R. Hirschheim et al. (eds.), *Information Systems Outsourcing*, Progress in IS,
DOI 10.1007/978-3-662-43820-6_10

1 Introduction

Much has been written on the topic of information technology (IT) outsourcing since it became a common business practice. Research in IT outsourcing has been published from the early 1990s (Dibbern et al. 2004). A longitudinal study of the onshore outsourcing journey of one large organisation (Alpha Corporation) over a 10 year period (1997–2006) has been previously published (Fisher et al. 2008). That paper documented what we described as three waves of outsourcing, including the decision-making process of Alpha Corporation over that ten year period. We reflected on what was then, current thinking relating to outsourcing decisions and how the company matured in its approach.

In this paper we provide more detail on the context which led to the initial decision to outsource IT services and, then, to move these services off shore. In order to better contextualise the outsourcing decision making process, we discuss external factors (Government policy changes), internal company changes, and changes to the internal IT function. The period 2003–2011 is covered, including the company's decision to move offshore, noting that, at the time the company took this decision it was the largest offshoring arrangement in Australia and still possibly the largest ever undertaken in Australia, and internationally.

To investigate this case we use the historical research method as described by Porra et al. (2013). As the authors argue, histories are an account of what has happened, and enable researchers to analyse, make sense and explain events. Whilst there have been a number of case studies looking at the impact of outsourcing on a particular company, there are few if any, historical studies of cases that have documented a long history of outsourcing decisions and changed outsourcing arrangements. The Alpha case is an example of a long term study of one large company that has experienced a variety of outsourcing changes, and we report on the totality of what they have done and the impacts.

2 From IT Outsourcing to Offshoring

There is an extensive literature base on IT outsourcing as noted by Dibbern et al. (2004) and Lacity et al. (2010). Typically, the early arrangements involved single vendors providing all services to a landscape today which has matured to the point where companies are more selective as to what and to whom they outsource (Hirschheim et al. 2002) their IT services and development. It is not our intention here to revisit that literature as many before us have covered it thoroughly.

Briefly the four most commonly cited rationales for outsourcing reported by Lacity et al. (2010) and supported by others are:

- Reduction in IT costs and improved operational efficiency (DiRomualdo and Gurbaxani 1998; Smith and McKeen 2004; Pelsak 2012).

- Enabling business to focus on other activities (Smith and McKeen 2004; Valorinta 2011).
- To access skills and expertise giving the organisation more flexibility (Smith and McKeen 2004).
- To improve business performance through leveraging the capabilities of an outsource provider (DiRomualdo and Gurbaxani 1998; Lacity et al. 2010). This can lead to innovations on the part of the vendors (Jayatilaka 2009).

Next we explore some of the current thinking on the issues organisations face in their outsourcing decision making.

2.1 Factors in Outsourcing and Offshoring of IT Services

Numerous researchers have documented a range of risks and issues with IT outsourcing and offshoring practice. Just as companies in the 1990s moved to outsource IT services and development primarily for reasons of cost we can see costs as a key driver for the move to offshoring.

Iacovou and Nakatsu (2008) explored with managers, risk factors in IT off shoring, their research identified 25 risk factors which were ranked. Palvia et al. (2011) investigated what they call "critical issues" from the perspective of Indian Information Systems vendors and identified 21 critical issues associated with IT offshoring. A review of the literature published in top journals by Wiener et al. (2010) explored IS offshoring from the perspective of project management. They identified three project management challenges and four factors they called "Determinants for ISO (Project) Performance/Success". In summary, drawing on the research mentioned above, the key issues reported include:

- The need for management commitment particularly where the organisation maybe an immature outsourcer. This commitment includes the support from and involvement in the decision making process by both business and IT executives (Winkler et al. 2006; Iacovou and Nakatsu 2008; Lacity et al. 2010; Willcocks 2010; Beulen et al. 2011; Palvia et al. 2011; Valorinta 2011; Zimmermann 2011).
- The importance of careful decision making on what will be outsourced and what will be managed in-house. This requires a full understanding of the business and technical knowledge of the client organisation. Critical decisions include the selection of people and skills including the skills required internally and those to be provided by outsourcing vendors. Offshore teams need to understand the staffing requirements, ensuring that the right skills are available when needed with an obligation to ensure no substitution of more experienced technical people with those less experienced (Smith and McKeen 2004; Winkler et al. 2006; Dibbern et al. 2008; Iacovou and Nakatsu 2008; Philip et al. 2009; Reynolds and Wilcocks 2009; Mathew 2011; Palvia et al. 2011).

- Ensuring good communications between the client and vendor is particularly important when key decisions are made. Geographic location can have an impact where there are time differences making person-to-person communication and meetings more difficult. Time can be wasted in many email exchanges trying to resolve issues (Avison and Banks 2008; Dibbern et al. 2008; Iacovou and Nakatsu 2008; Mahnke et al. 2008; Philip et al. 2009; Schwarz et al. 2009; Wiener et al. 2010; Beulen et al. 2011; Palvia et al. 2011).
- Having adequate documentation, such as well thought out and detailed contracts which incorporate the employment of appropriate IT technical expertise, service level agreements, and well described and clear requirements. Formally documented processes, including roles and responsibilities particularly for project management are essential (Barthelemy and Geyer 2004; Smith and McKeen 2004; Winkler et al. 2006; Iacovou and Nakatsu 2008; Mahnke et al. 2008; Rottman and Lacity 2008; Philip et al. 2009; Schwarz et al. 2009; Goo 2010; Lacity et al. 2010; Wiener et al. 2010; Mathew 2011; Palvia et al. 2011).
- Legal issues relate to this including contract negotiation, enforcement and contract management including managing IP (Gopal et al. 2003; Barthelemy and Geyer 2004; Smith and McKeen 2004; Winkler et al. 2006; Iacovou and Nakatsu 2008; Mahnke et al. 2008; Rottman and Lacity 2008; Philip et al. 2009; Schwarz et al. 2009; Goo 2010; Lacity et al. 2010; Wiener et al. 2010; Mathew 2011; Palvia et al. 2011).
- Understanding the full costs of all outsourcing activities and ongoing cost management is crucial. In the case of offshore activities some costs may go unidentified. These include the need for more detailed documentation and specifications, language translation, the need for face to face meetings and the associated travel and more time required to coordinate teams at a distance (Ho et al. 2003; Dibbern et al. 2008; Iacovou and Nakatsu 2008; Mahnke et al. 2008; Rottman and Lacity 2008; Schwarz et al. 2009; Willcocks 2010; Mathew 2011).
- Ensuring adequate knowledge sharing or knowledge transfer which impact on outcomes as critical information needed for the project or service delivery is provided. (Kotlarsky and Oshri 2005; Rottman and Lacity 2008; Wiener et al. 2010; Beulen et al. 2011)
- There can be difficulties where different cultures are involved, arising from different styles of working and work practices which may present challenges to building effective teams. Other issues include reaching a common understanding, enabling open discussion and resolving conflict. Understanding of hierarchy in the Indian context is required (Nicholson and Sahay 2004; Winkler et al. 2006; Avison and Banks 2008; Dibbern et al. 2008; Mahnke et al. 2008; Philip et al. 2009; Rai et al. 2009; Wiener et al. 2010; Palvia et al. 2011).

2.2 Offshoring of IT to India

India today is a major player in IT offshoring with a number of large Indian organisations supplying offshore capabilities globally. There are many published papers detailing Indian case studies. Despite the distance between India and Europe, the US and Australia, India has been a natural choice for many organisations for a range of reasons (Ang and Inkpen 2008):there are many skilled and trained IT professionals in India; English is widely spoken; and, labour costs are lower (Carmel and Agarwal 2002; Dibbern et al. 2008; Joshi and Mudigonda 2008).

3 Research Approach

In order to better understand the nature of outsourcing and how it has evolved at Alpha, we adopted an historical research method to study how and why Alpha management chose the approaches they chose in their outsourcing decisions. We felt that an historical lens would add insight into a process which is typically perceived as rationally driven but rarely studied over long periods. In the field of IS, there are, however, few exemplars for using an historical research approach. Fortunately, the work of Porra et al. (2013), who studied the history of IT at Texaco, provides a guide for how to conduct historical research (See also Mason et al. Mason et al. 1997; Porra et al. 2013).

Writing history, however, is far from straightforward. It involves the historical researcher attempting to make sense of 'reality' when in fact 'reality' is grounded in the environment and experience of each individual, which is likely to be different for each individual, and thus can never be perfectly understood. The job of the historical researcher is to make sense of this 'reality' using the lens of history as a vehicle for 'reading' the story.

According to Topolski (1976) the historical method is really a class of methods aimed at presenting and interpreting the past. Historians often conceive of historical research as an objective pursuit that uncovers the true nature of the past, which stands in stark contrast with interpretive approaches which eschew the notion of any 'true nature'. In our research we chose to adopt a more interpretive perspective of historical research. More specifically, we constructed an Outsourcing timeline at Alpha which can best be characterized as a history building exercise in the spirit of deconstructionist writings. We then offer an explanation on why we think the Alpha Outsourcing story happened the way it did, and what its affects were.

In our construction of Alpha's Outsourcing history, we tried to embrace the spirit of deconstructionist history (Derrida 1978). According to this stance, we regarded Alpha's Outsourcing history a narrative of the past (Munslow 1997). In such narratives, the reality of the past is the written document by the historian rather than the past as it actually happened. Just as it is impossible to have a

narrative without a narrator, we cannot have a history without a historian. Thus, every history contains ideas or theories about the nature of change as held by historians. It is the historian's interpretation of the past. As such it is subject to debate, disconfirmation, and the possibility of other historians offering equally compelling alternative explanations.

In offering our account of the history, we see that in retrospect, Alpha's Outsourcing history was largely a success although it contained episodes of both success and failure. As Alpha's experience with outsourcing grew, it became more comfortable with embracing new forms of outsourcing. The experiences of Alpha allow us to offer some lessons which hopefully will prove valuable for other organizations as they evolve their own outsourcing strategies.

The data for the case study comes from two of the authors who worked for the organisation at senior levels where outsourcing decisions were made. Both therefore have a deep knowledge and experience of the IT outsourcing arrangements and its history. One author left the organisation in 2003 and at the time was the National Sourcing Manager for IT procurement. The second was a business unit CIO (mobiles) within the federated IT organisation and was appointed acting CIO for a period of time prior to the permanent appointment. He held senior positions during the offshoring decision making period and has substantial knowledge of and insights into the outsourcing/offshore arrangements in Alpha Corporation. He left the organisation in 2011 and began work with one of the vendors providing offshoring services for Alpha Corporation. He has therefore, been able to provide a perspective from both within Alpha as the customer and outside as the vendor. In addition, publicly available documents detailing different aspects of the organisation's decisions and reports to the market were analysed and used to illustrate and support the details of the case study presented. These documents included: (1) company annual reports (2003–2010); (2) annual lodgements to the Australian Stock Exchange in the form of investment analyst briefings (2003–2010). These are presented to the market analysts by the senior executive team (CIO and CFO). The lodgements include details on the company's financial and business strategy decisions; (3) industry press reports; (4) Australian Government website which detailed the timeline from the incorporation of the company in 1991 to late 2003 when the decision to sell the remaining shares in Alpha was made by the Government. This website also included details on the share offer price, returns from the sale, returns to the government, etc.

4 The Case Study

Alpha Corporation was the subject of a published case study in IT outsourcing covering the period 1996–2003, during which Alpha progressively outsourced its IT application services and data centre operations (Fisher et al. 2008). This paper again explores Alpha but in a wider timeframe—roughly 15 years until recently (2012) so to place the IT outsourcing in the politico/business/market context that

has influenced and driven the IT decisions made by Alpha. In particular, we focus on the external pressures (external to both the organisation and IT services area) and internal pressures coming from the IT services area.

Although our analysis begins in 1996, we do provide a limited description of the period from the early 1990s when major changes were made to Alpha at that time a government owned monopoly, to create a commercial organisation, and to open Alpha's market to competition, by the then Government. The paper covers Alpha's experience of moving to off-shore IT providers, and then the outcomes for IT of a decision by Alpha to undertake a major business transformation, involving replacement of its core technology platforms, the related IT applications and operations, and redesign of Alpha's business organisation and processes.

Any major Government policy shift with respect to an industry will require adjustments within that industry. The paper is presented as a series of specific time periods which relate to major IT changes within Alpha, driven by internal factors and external market forces. For each period we provide a brief overview of the external factors which impacted the Alpha organisation, the impact on its IT function and the consequential outsourcing decisions.

4.1 Background to Alpha Corporation

Alpha is a large telecommunications company with a dominant market share and with 90 years' experience in providing essential utility services. It is a full services provider, providing a complete range of telecommunications products to the Australian market, including fixed line telephony, mobile phones, internet data services, private networks, and pay TV. Alpha's telecommunications products and services are primarily technology based, and are continually adapting and changing with the impacts of new technologies and market competition.

From being a government owned monopoly, Alpha was transformed from an engineering/technology based government department, to a commercial corporation, and ultimately to a publicly owned share traded company, over the period from 1990 to 2003.

As part of the transition, Alpha's internal business service functions were reorganized and centralised, and full costing and transfer pricing of these services was implemented. Functions were progressively reviewed against external market service providers, and then outsourced in part or wholly to the external market, including services for: accounting, training, fleet management, engineering construction, warehousing, information technology, and property and accommodation. IT was one of the last functions to be outsourced, with the initial major deal, with a large multinational corporation (Delta), occurring in 1997.

The introduction of market competition in the early 1990s placed immediate pressure on Alpha's profitability (see Fig. 1), since the new competitors were new start-up companies with lower costs compared with Alpha's much higher fixed cost base.

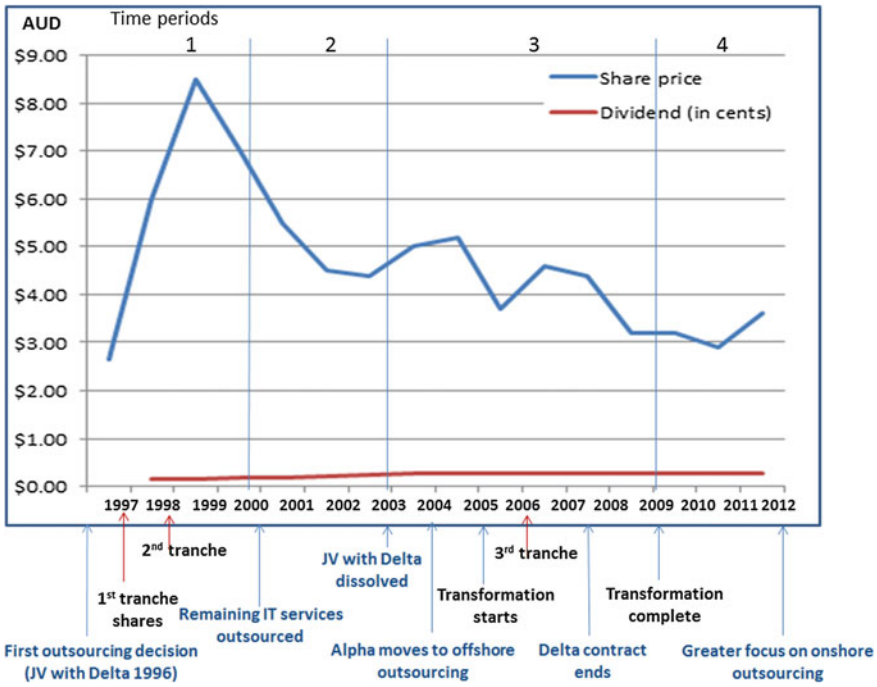


Fig. 1 Alpha share price and the dividend return (1996–2012)

4.1.1 Alpha Financials

Figure 1 provides an overview of Alpha share price from the sale of the first tranche of shares to the end of 2012 and the dividends paid to investors over the same period of time. Included is a timeline of events.

Figure 1 details the share price and dividend paid to share-holders from the time of privatisation to 2012. It can be seen that while the dividend remained steady, the share price declined. In 2000 the dividend was 18c per share, in 2003, 24c per share and from 2005 until 2012, 28 cents per share was paid to shareholders.

4.2 Government Monopoly to an Incorporated Company (1991–1995)

In November 1991, as part of economic reforms by the Australian government, Alpha was incorporated—ceasing to be a Government department (but wholly government owned), and was required to begin trading subject to the requirements of Australian Corporation law.

Alpha was restructured and incorporated in 1991 as part of the Government's policies of reforming government businesses into commercial company structures. A senior experienced CEO was recruited from the USA to oversee the change of Alpha to become market and customer product based company.

Competition was introduced into the telecommunications market initially in 1992 for carrier (long distance) services and for mobile telephony. The new market entrant purchased the AUSSAT satellite communication network, enabling immediate competition with Alpha, and built a new mobile telephony network. Alpha was required to provide various infrastructure and interconnection services at a regulated wholesale rate for the new competitors. During this time a major restructure of Alpha was necessary given the cost pressure from the new player in the market.

4.2.1 IT Services at Alpha

Alpha was an early user of large scale computing for its engineering and billing needs. The IT service function evolved in-house, from managing the earliest 'data processing' systems, to operation of a full scale modern corporate platform, with three large data centers for mainframe computer systems. All IT work was done in house, including coding, support, maintenance, and development. In this period, Alpha's internal IT group had more than 3000 staff and contractors. IT was one of the last functions to be centralized, but this had minimal impact on staff numbers.

4.3 The Move to Privatization Begins (1996–2000)

The election of a conservative Government in 1996, with an election mandate to sell one third of the company, started the process to privatise Alpha. This was politically contentious because of the government's ongoing budget need for the revenue generated by Alpha, as well as the continuing role Alpha had in providing regulated services to rural and remote communities, and the need for investment and service quality guarantees for this role. The public listing required Alpha to demonstrate and achieve market benchmark financial ratios. These factors all increased pressures to reduce costs and to maintain revenues and profit margins.

The initial 1997 share offer was more than four times over subscribed and raised around AUD$16bn for the government, in addition to a AUD$3bn special dividend paid just prior to the float. A large number (2.5 million) of small 'mum and dad' shareholders purchased shares in Alpha, as did most of Alpha's employees. This ensured that Alpha's business success or failure would be a broad community issue, and created an imperative for Alpha to maintain profitability and dividend payments.

In 1998 the Government announced the decision to fully privatise Alpha, with the initial further sale of shares in Alpha to the level of 49 % public ownership,

including an agreement to provide aAUD$1bn package for rural and regional infrastructure upgrades.This second share sale, completed in October 1999, generated proceeds for the government of around AUD$16bn (the issue price was roughly double the initial 1997 issue price), and left the Government with a 51% share, and control. Again there was wide investment by small shareholders, and continuing pressure on Alpha to maintain share price and dividend levels. History has shown that Alpha's share price subsequently fell to well below this second issue price leaving many small investors with losses, and with reputational issues for both Alpha and the government.

At the time of the second share issue there were two other significant changes impacting Alpha:

- Alpha's monopoly of the local copper loop network ended, with Alpha then facing full competition for all telephony services, including fixed line telephony and data.
- The Chairman of the Board and the Alpha CEO who had overseen the corporate development from 1992, through to privatisation, both left the company, and a new Chairman and CEO were appointed.

4.3.1 IT Changes During the Privatisation Period 1995–2000

Typically industry practice is for IT budgets to be managed by the sponsoring business units, apart from core infrastructure such as data centres. This gives business units control over decisions regarding scope of IT changes and work priorities.

A 'federated' IT organisation: Alpha's IT organization was decentralized in 1999 and functions distributed to the various Business Units (BU), with a corporate IT function coordinating the IT budgets. Each BU had their own CIO and a team of architects and program managers. All systems work was managed and delivered by Alpha's BUs which was able to order IT work on a cost based basis from in-house or outsource service providers depending on particular application support arrangements.

4.3.2 Outsourcing of IT Services

1997 was the start of Alpha's outsourcing journey with a (JV) partnership between Alpha and a large multinational IT service provider (Delta) under a major 10 year contract for IT application support and maintenance, and for all data centre operations services. The arrangement involved the transfer of around 2000 staff from Alpha to Delta, and at the time was the largest outsourcing arrangement in Australia. Alpha retained in-house IT services for two key business platforms: the customer billing platform, and the ERP systems.

Completion of the IT outsourcing In 2000, given the experience with the Delta agreement, and with the benefit of wider industry best practice, Alpha reviewed their IT outsourcing arrangements and sought to outsource the remainder of their in house applications, and to change the scope of the outsourcing arrangements with Delta. Following a tender process, a new five year contract was signed with two new outsource providers to provide outsourcing services for the Billing and ERP platforms, however only limited changes were possible to the in-place contract with Delta.

The budgets for IT application support and maintenance were the responsibility of the sponsoring BU. The corporate CIO and his small central office managed the major centralized infrastructure such as the data centres, and provided coordination and standardization between the BU IT teams. The interactions between the BUs and the outsourcers had to support the work ordering and delivery processes that were focused on the BU. Where the BU requirement involved multiple system changes with multiple outsource providers there was a need for a mechanism where one outsource provider assumed sole responsibility to co-ordinate all work for that change.

4.4 Towards Full Privatisation (2001–2003)

The conservative Government was re-elected for a third term in late 2001, and Alpha was again the subject of a key communications policy. A decision to sell the remaining 51 % of shares was taken, but only if Alpha would again commit to improvements in regional telecommunications services. The approval for the sale passed through the parliament in mid-2003 with the sale to be completed in 2006. The sale terms provided the government with a continued range of legislative powers over Alpha which included an obligation by Alpha to provide financial and other information to the government. The Communications Minister had power to direct Alpha to act in the public interest, and to prevent Alpha from reducing the government's equity in the company (for example by issuing new shares).

At the end of 2003, as part of its business evolution and under competitive and technology pressures Alpha restructured its BUs. The Mobiles telephony business, which had been stand-alone, was integrated back into the corporation. The BUs now were: Enterprise customers, Mobiles, Wholesale, Consumer, and Business.

4.4.1 A Review of Alpha's IT

Alpha recruited a new corporate CIO in 2001. He instigated a review of Alpha's IT, and restructured the IT function. This restructure was an opportunity to centralize some IT functions from the BUs, and to bring other IT functions (IT strategy, business cases, architecture, platform strategy) in-house from existing outsource providers enabling:

- Delivery of IT by 'solution centres' on a cross BU basis–and based on standardized platforms (including for ERP, CRM. Billing, middleware, data warehousing, etc.)—noting that similar platforms were being used by different BUs, but with variations and duplication in function.
- Central architecture control based on these core platforms: including SAP, CRM, data warehousing, billing.
- Retention of the central infrastructure group.
- A new vendor strategy, with a move to offshore outsource service delivery.

This new IT organization was focused around the selection and management of the key future platforms. A core precept was that product/platform vendors would not also provide system integration services (and vice versa). For example, it was found that the outsourcing companies were writing business cases for IT works on behalf of Alpha's BUs allowing a vendor to choose software and hardware so as to channel additional services to that vendor.

Alpha nominated specific areas where they would take accountability, and there was a skills rebalancing—into program management, business analysis, and operations, involving IT staffing increased by approximately 20 % (approximately 200 staff).

The BU CIOs were retained but with a focus on definition of business functionality, and coordination of BU priorities within the delivery solution centres. Additional to the established IT outsource providers, some BUs had other small outsource arrangements, including with Indian companies which were establishing themselves in Australia at that time.

4.4.2 Alpha's IT Outsourcing Moves Offshore

In 2003 the JV agreement between Alpha and Delta was dissolved and the contract renegotiated: to change to the entity which delivered the services; and to remove most of the onerous guarantees around work volumes and cash flows. This enabled the CIO to implement a new vendor strategy and to direct some of this work to other providers.

The new Alpha CIO had experience of outsourcing service delivery by Indian providers, and held the view that the service cost and quality was superior. As key business drivers, the CIO undertook to achieve improvements in delivery quality and timeliness; and cost reductions of 20–30 %. Alpha took the decision that a substantial amount of IT work would now be provided offshore, to achieve significant savings in cost, and improvements in delivery. This was a change in company policy as the key shareholder (the government) had previously required that all outsourcing be provided onshore as a public policy issue for Alpha.

In mid-2003 the CIO and his IT leadership team visited India. The Alpha team visited various Indian companies, assessing each according to their capabilities in the functional areas identified through the IT restructure. The companies visited had experience and established global delivery models, involving a mix of

(client location) onshore resources (20–30 %) and lower cost offshore delivery resources (70–80 %).

With an understanding of Alpha's application landscape the IT team agreed on the new vendor strategy having assessed each Indian company for capability; experience, number of international clients and the number of people working internationally. This guided the team in the assigning of IT functions (services, scope) to particular Indian providers, on the basis of their capability. Key vendors chosen were Infosys, Satyam, HP (India) and Delta (India) and the decision was taken to terminate the contract with Deloitte which had been managing the ERP platform.

The IT application services chosen to move to Indian offshore outsourcing providers included the services provided by Delta, which at the time had no offshore resource capability. It was made clear to Delta that they needed offshore outsource capability to be price competitive for Alpha. Delta undertook a new relationship with Delta India, a separate Delta company, and changed to the offshore delivery model and pricing.

Following a commercial process, Alpha completed new IT outsource agreements and the transition to offshore outsource providers was completed in 2004. At the time this was the largest IT offshore outsourcing project for an Australian corporation:

- InfoSys and Satyam were engaged
- The second wave outsourcing agreement with Deloitte was terminated (moved to Satyam)
- Application services provided by Delta were moved to InfoSys, or to Delta India
- Application services provided by EDS/HP were changed to delivery by HP India. (note EDS was acquired by HP in 2008).

The vendor agreements were of two types: fixed price for agreed scope of application support and maintenance work; and agreed (variable price based on time and materials) price work for (discretionary) system modifications and enhancements. The contracts were new: they had no work guarantees, but included discounts for high volume; the onshore/offshore work was defined, and the 'blended' labour rates carefully monitored; there were new processes to manage incidents; there were new processes for the respective workforce, including management of time zone issues.

Alpha's global delivery model Although Alpha did not have any experience with offshore outsourcing and Indian vendors, Infosys and Satyam each had a global delivery model and a transition methodology that was used to transition Alpha's applications.

Alpha's IT global delivery model is similar to that pioneered by Infosys, and involves vendor teams located onshore with the client organisation, to manage delivery and to provide the interaction and co-ordination with vendor teams located in various other offshore locations.

4.4.3 Summary of the Outcomes from Offshore IT Outsourcing

The offshore outsourcing was/is cost monitored and managed by Alpha, particularly for the fixed price maintenance support services, and the objectives: of cost reduction and quality improvement were realized. For other discretionary project services it is less clear, other than for the lower 'blended' labour rate, since IT services are only a part of a larger picture of specification, delivery, and implementation. Alpha retains essentially the same IT functional organization and IT outsourcing practice that was set up in this period.

The CIO who sponsored and drove the off shore outsourcing, left Alpha in 2004. The IT organization and offshore outsourcing approach he implemented remains largely in place at this time.

4.5 Full Privatisation of Alpha and a Business Transformation (2004–2009)

2006 saw the sale of the remaining Alpha shares in government hands. Again the public share offer was oversubscribed, with an estimated return to the government of AUD$8bn. A government owned investment vehicle, the Future Fund, retained 17 % of Alpha's shares. At the time of writing, the government, through the Future Fund, controls just over 10 % of Alpha.

Alpha's share price had languished since the highs of around $7 in 2000 and the sale price of the final parcel of Alpha shares dropped to just under AUD$4 (see Fig. 1). The reasons for the share price drop included the intense competitive price pressures in the high margin products: mobiles, and local loop; and there was pressure for Alpha to find new product revenue streams: including from international Telco business investment; and from content provision. It was also clear that Alpha was under invested in its core platform technology and IT systems, in part as a result of the high dividend policy and the demands for capital returns to the government. Alpha had an aging and obsolete network, and an inefficient patchwork of supporting IT systems. The combined effects of unsustainable dividends, loss of mobiles market share, poor customer relations led to decline in share price, with poor prospects of recovery.

At a Corporate level, competitive pressures on Alpha, and debate and disagreement at Board level over strategic direction led to the resignation and replacement of the Chairman, and the appointment in 2005 of a new CEO with a US Telco background. The new CEO brought with him a team of key senior people from the United States.

4.5.1 Alpha's Business Transformation Decision and IT Transformation: 2005

This change at Board and CEO levels, including the engagement in Operations and Technology roles of new key senior executives with US Telco experience, led to a major company business review. A decision to undertake a major replacement and upgrade of Alpha's network and IT technology platforms, and a business transformation of Alpha Corporation, was outlined to the share market in Nov 2005 disclosures. The project would essentially replace and renew all of Alpha's legacy platforms with new integrated platforms, including customer access technology, and the supporting IT platforms. The objective was to establish competitive advantages of scale and integration over Alpha's (smaller) competitors. The key elements of this transformation were:

- Modernize the core digital network technology
- Replace the mobile data and telephony platforms
- Replace the existing 'legacy' IT systems with best practice 'Off The Shelf' (OTS) platforms
- Implement a new business organization and integration of products
- Reduce the complexity and number of IT systems
- Reduce the number of key vendors providing platforms

The transformation cost was approximately AUD$14bn, of which new IT spending was approximately AUD$4bn and the network platform approximately AUD$10Bn. To implement such a large strategy, a specific set of key global vendors were selected, with a focus on experience, and capability to deliver against a tight schedule.

The key project imperatives included focus on achieving the required functionality, delivered within the timeframe. To achieve these, Alpha assumed the 'prime contractor' project direction role, with strict project coordination and communication processes imposed on the vendors.

A new and separate IT organization was established to deliver the IT transformation. Key vendors were chosen based on the products they sold or serviced, and on their worldwide expertise and ability to deliver large transformation programs. Most of the work was carried out by onshore project teams.

Accenture was the prime contractor for delivery of the new IT providing the software platforms strategy, architecture, and program delivery and also provided support and maintenance under short term contracts.

The legacy IT was initially managed separately, but with a view to integrating and taking up the new platforms as the project progressed. This proved unworkable, and the legacy IT and the transformation IT project were brought together and coordinated under the overall project executive.

4.5.2 IT Outsource Providers' Review

The transformation project activities: business analysis, specification, package configuration and implementation change management, had less direct need for offshore outsource resources, and a greater need for the higher level onshore outsource IT expertise. It is estimated that the peak activity of the project (involving approximately 7,000 IT staff) had a ratio of offshore/onshore labour of 50:50. With the completion of the project, this ratio has reverted to 80:20, across the outsource providers.

The Indian 'legacy' outsource providers were not engaged for this new IT delivery work, but continued to support the 'legacy 'systems. In practice, the need to integrate new platforms with the legacy systems led to increased work volumes for the Indian providers.

The Delta outsource agreement ended in 2007 (after 10 years) enabling a renegotiation. At this time, Alpha evaluated their vendor strategy with a view to further rationalisation. The agreement with Satyam was subsequently terminated, resulting in Alpha having IT service agreements with three key providers: Accenture (for the new systems), Infosys (legacy systems) and HP (legacy billing). Under a new deal with Delta, the vendor would provide only data centre and infrastructure services.

4.6 Transformation Complete (2009-Current)

Alpha's transformation project was completed by 2009 after 4–5 years of effort. The CEO who initiated and directed the transformation, and the senior executives who delivered the work left Alpha by early 2009, and a new CEO was appointed in 2009.

A major ongoing business transformation project is in place, and is ongoing, to redefine and simplify Alpha's telephony and data products based on the new platforms and exploiting the inherent capabilities of internet online platforms, such as lower costs due to customer online self-service.

4.6.1 IT Work and Outsourcing Post Transformation

Ongoing enhancements and migrations and system decommissioning have become part of the 'business as usual' ongoing IT investment program. Alpha now has a new technology platform and associated support IT systems.

Alpha continues today with the tasks of migrating the last of the 9 m+ customers, deleting legacy products, and decommissioning the legacy IT systems. The new systems are managed by a local company primarily with onshore resources.

The legacy systems were largely bespoke. Custom built and coded specifically for Alpha's business needs. The new systems are industry standard off-the-shelf

(OTS) software owned and licensed from large third party software providers. The task of maintaining and enhancing these package products is undertaken by the software providers who have their own offshore software development resources. There are ongoing integration customizations, maintenance and enhancements required by Alpha, and currently provided under Alpha's offshore outsource arrangements.

5 Learning from Experience

The early outsourcing experience of Alpha is described in our first paper (Fisher et al. 2008). Although broadly successful, there were many issues with the operation of the first IT outsourcing agreement: with hind sight, issues arising from inexperience with the scale and nature of the commitments by each party. Key issues included: the term of agreement (10 years) was too long; there were onerous contract termination conditions that constrained Alpha's ability to negotiate changes to the arrangement, as Alpha's business conditions changed; and there were inherent conflicts of interest in the JV arrangement between a supplier (Delta) and a customer (Alpha). Pricing changes were a particularly difficult issue—immediately on contract signing there were significant additional IT programs of work: to modernize or replace older systems with the Year 2000 date risks; and to prepare for a new consumption tax (a GST) introduced by the Government to commence in July 2000. These programs, on top of the business as usual systems work, resulted in an increase in IT enhancement workload, and over-recovery of costs by Delta. New lower price arrangements worked fine initially, but, when work volumes eventually reduced to the expected level from the highs created by Y2K and the GST, Alpha ordered work unnecessarily to maintain volume discounts.

In the next section we discuss some of the issues and responses by Alpha in moving IT service provision offshore.

5.1 Transition to Offshore

There has been significant research published on factors or issues that are likely to impact on the success of offshore IT service arrangements (see for example Winkler et al. 2006; Rottman and Lacity 2009; Wiener et al. 2010; Palvia et al. 2011). We explore our case study using two published frameworks Winkler et al. (2009) and Palvia et al. (2011). These two studies were deemed to be the most relevant to our case study given Alpha moved IT service provision to India.

- Research by Winkler et al. (2009) examined offshoring success from the perspective of culture. They propose that cultural differences are "power distance,

IS designer values, criticism behaviour, activity". Cultural differences were seen to influence behaviour relating to service delivery however, they claim, effective management can address these. Behavioral differences can have an effect on the quality of the relationship which is defined as consisting of trust, performance, cooperation and conflict between the vendor and client. This in turn will impact on the outcomes defined as "Cost reduction, Resource quality, Increased flexibility, Service quality" and these together lead to overall satisfaction and by implication success.

- Palvia et al. (2011)'s work examined issues specifically related to Indian outsourcing vendors. They identified three vendor issues which are critical to IS outsourcing success. Most important of these they argue, is the relationship with the client which included communication, top management involvement and documentation detailing the client's processes. Second was the extent to which the client is ready and has the capability. This was demonstrated by the involvement of appropriate people for knowledge transfer, legal matters, readiness of the client to re-engineer their processes, staffing and clear definition of roles and responsibilities. Lastly and least important Palvia et al. (2011) claim for the vendors were issues relating to culture, language, time zones and resistance to outsourcing by the clients and employees.

These two studies encapsulate many of the key issues relating to offshore IT service arrangements. We acknowledge there are other related studies however; these two provide the most useful lenses through which to view our findings. We identified three areas we believe capture the essence of the two frameworks, these are leadership and management, readiness to outsource offshore and dealing with culture.

5.1.1 Leadership and Management

As highlighted by both Palvia et al. (2011) and Winkler et al. (2009), strong leadership and top management support is critically important and is needed within both the client and vendor organisation. Client relationships Palvia et al. (2011) argue is the most important criteria for success in offshoring from a vendor perspective. Alpha already had a relationship with two of the onshore vendors who had Indian offshore divisions. Infosys was Indian based but bought a small company providing services to Alpha giving them an Australian base. With vendors having both an onshore and offshore presence relationships with the vendors was made easier.

The decision to initially outsource IT services and then to move services offshore to India was taken at very senior levels within Alpha both with senior business and IT management involved. Senior executives in the vendor organisations were also engaged in the process early.

In the early stages Alpha needed to manage public perceptions and political reaction to sending Australian jobs to India. Pressure was exerted on sitting MPs

by onshore vendors. This was managed successfully by Alpha through a media campaign initiated by senior managers.

Within Alpha there was a period of systems operational instability during the vendor transition. This was expected and was managed within the transition methodology and within the expected timeframe.

Both Infosys and Alpha needed to manage transition risks arising from a particular small Australian company which was providing business critical software and support in an outsourcing arrangement for Alpha's sales and business platforms. Communications, documentation, training and knowledge transfer of this company needed to be managed. Senior management at Infosys decided to acquire the company outright. This company thus provided Infosys with a base organisation in Australia and became the current Infosys Australia.

Although Alpha's senior managers recognised the need for regular contact with the offshore vendors it was not until later that it was appreciated that more regular visits to the India were needed. It was later acknowledged that these visits should have been more frequent given the size of the outsourcing work undertaken offshore. These arrangements were costly but crucial for dealing with the disconnect in terms of expectations.

There was some pushback by current vendors, notably Delta (Australia), requiring them to change their organizations in order to continue to provide IT services to Alpha. Companies needed to engage offshore resources which initially Delta (Australia) did not have and required Delta to cut a deal with their Indian division where previously there had been no commercial relationship. Alpha was now able benefit from Indian offshore pricing.

5.1.2 Readiness and Commitment to Outsource Offshore

Readiness of an organisation to engage with outsourcing and offshore IT service delivery is frequently mentioned in the literature. The research of Palvia et al. (2011) found that vendors saw readiness and commitment to outsourcing as important for overall success of outsourcing arrangements. They highlighted the importance of the client having clearly defined roles and responsibilities and processes in place.

In the case of Alpha it was possibly the most important factor in what was regarded as a successful offshore initiative. By 2003 Alpha had 6 years of outsourcing experience; Alpha's IT services were already significantly outsourced, and the business overheads relating to restructuring had already taken place. Alpha had a mature IT outsourcing culture and organization, with established commercial arrangements suited to outsourcing. While noting that offshore outsourcing required some onshore/offshore mix of operational delivery functions (a global delivery model) Alpha was in a strong position to move IT work offshore when it did, with a focus on vendor capability. One outcome of this was the ability of Alpha to seamlessly transition to new vendor arrangements as was the case in 2007 when Alpha again reviewed their arrangements and rationalised the number of vendors reducing from four primary vendors to three.

Further readiness can be illustrated by the Business Units seeing little change in the delivery of IT services in the transition to offshore IT service provision ensuring there were minimal issues within the organisation. The offshore arrangements saved the BUs money.

Alpha had a comprehensive risk management methodology for projects based on Australian standards and ISO standards for risk management. This detailed risk management process was used to identify and mitigate the key risks and issues, in particular.

- Profiles of risks around key people, knowledge retention, resources were established and managed by Alpha
- Key individuals were recruited into the vendor organizations, or to Alpha.

Given Alpha's early outsourcing experience, the engagement model proposed with the vendors was not overly complicated: the commercial construct for payment was an agreed daily rate for various IT personnel competency levels. New to Alpha was the onshore-offshore labour ratio and a 'blended' rate calculated from the onshore and offshore components. To ensure the cost benefits were realized, the contract allowed Alpha to manage the blended rate ratio (notionally 70 % offshore and 30 % onshore). The ratios could vary depending on the activity however this would have to be signed off by Alpha. This caused some tensions since Alpha staff would prefer that more onshore people be used because, they would argue, they were unsure about the offshore people and whether they would deliver as required.

KPIs and service level agreements were different to the onshore contracts which used an administratively complex service measurement approach, with performance debits/credits for failure to meet performance levels. The offshore agreements use a balanced scorecard approach, which was easier to manage.

5.1.3 Managing Culture

It is widely recognised that culture, language and geographic locations impact on the outcomes of offshore outsourcing arrangements. Winkler et al. (2009) highlight the role strong leadership and management play in addressing potential issues relating to cultural differences. On the other hand, whilst Palvia et al. (2011) recognise the impact cultural differences may have, the results of their research suggest vendors do not see cultural differences as important as language and geographic location.

Alpha recognised that cultural difference were likely to be a problem. Senior management took a leading role in addressing this. In the early days Alpha engaged an external facilitator with experience specifically with Indian vendors. This facilitator conducted joint sessions with both the Alpha and Indian vendor teams to deal with, for example:

- Terminology: As observed by Winkler et al. (2009) Indian vendors can have cultural difficulties saying 'no'. It was found that often the Indian vendors will say 'yes' even though they cannot deliver.

- Although all members of both teams were speaking English, with differences in accents and terminology usage, it was still not easy to understand everything that was said.
- Interaction: the Indian vendors would not push back on things they knew did not make sense or were wrong or where they would do something differently. This Winkler et al. (2009) suggest may be an indication of a power distance issue.
- It was also found that the Indians would accept what they were given to do and do it that way even if there was a better way.

Issues arose in onshore—offshore remote operations, due to nuances of effects of time zones, and the offshore vendors not having a sufficient understanding of the size and complexity of Alpha.

There were also differences in expectations. The offshore teams did not always understand Alpha's expectations. To address this issue, senior Alpha executives visited India every 8 months, and executives from Infosys and Satyam also came to Australia regularly for the first 3 years. This resulted in higher, unanticipated costs.

Legal issues relating to contracts and Intellectual Property were not an issue for Alpha. Indian and Australian law is based on English law resulting in a common understanding of the meaning of contracts terms, and in similar business practices. Indian legal firms were used to set up the contracts. Although there could be no guarantees with respect to contracts with Indian companies, contract law is essentially the same and to date there have been no legal issues. Further, the companies Alpha dealt with are large multi-national companies and looking to continue to work with other Australian companies.

6 Discussion

Alpha's experience with outsourcing prior to the decision to move offshore resulted in a model where systems that were high risk (critical to the operation of the company) were owned and managed internally by Alpha. Low risk systems, such as legacy systems, were owned by the vendors. Although Alpha had an established IT outsource culture at the time the offshore decisions were made, a range of new transition issues had to be managed.

Because of the pressure Alpha was under post privatisation to maintain the dividend yield to shareholders, cost was a major driver for the first outsourcing decisions. Similarly, the move offshore was implemented when the company looked for a 20–30 % savings in its IT budget.

Alpha corporation by 2013 had completed its transformation process and as part of that transformation, the outsourcing arrangements were refined. Today the

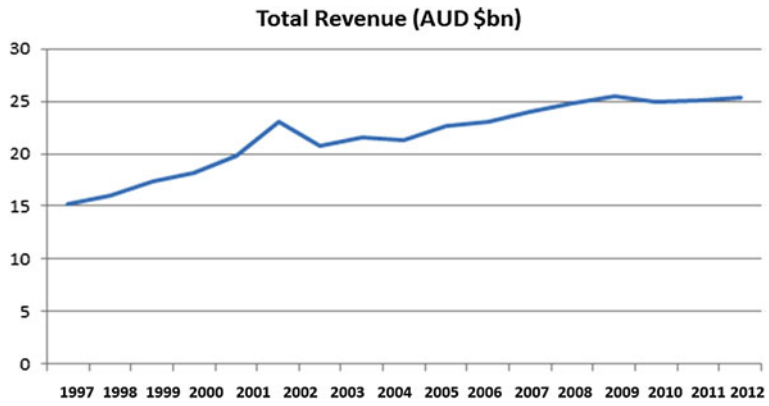


Fig. 2 Total revenues earned by Alpha (1996–2012)

company employs a standard international onshore/offshore sourcing model. They are able to accurately measure onshore/offshore components to ensure that cost-benefits are achieved. During the transformation period there was no attempt to measure the onshore/offshore costs because of the focus on system transformation.

Figure 2, details the significant revenue Alpha returned to the Government resulting in further pressure on IT budgets which in turn drove outsourcing and in particular offshore decisions from 2005.

In the period up to full privatization in 2005 the company was under-investing in infrastructure, including IT, because of the 'special dividends' the Government owner was extracting.

Once the transformation and reinvestment in infrastructure had been made after full privatisation, Alpha's share price began to rise (see Fig. 1). At this time, having reviewed operations across the organization and in particular, implemented a new strategy for IT moving to off the shelf software, Alpha again reviewed outsourcing arrangements and now has a stronger focus on onshore outsource providers and a declining reliance on offshore IT service provision.

6.1 Was the Offshoring of IT Services Successful?

Overall, Alpha Corporation views their outsourcing/offshoring arrangements to be successful. They achieved a reduction in costs and the quality of IT services improved. The BUs appear happy with IT services provision. Success for Alpha was defined as cost reduction (i.e. achieved 30 % plus cost savings) given the offshore-onshore model. This model worked successfully and as a result the company had better quality software and better software maintenance. There were improvements on all of the service level metrics such as response time, level of rework, number of faults, and fault clearance times. Initially the outsourcing model

Alpha designed aimed to achieve a 70-30 split between offshore and onshore work and costs. During the transformation delivery project, that split reversed, with as much as 80 % of the work undertaken onshore. However, once that was complete the 70-30 offshore/onshore work ratio is again in place.

Issues arose from the (newness/immaturity) of the Australian onshore vendor organization and resourcing of these by the Indian companies. The Indian companies did not have established onshore business entities or suitable skilled onshore expertise. Infosys addressed this in part by purchasing a company with an established contract with Alpha and a core cohort of experienced IT people. Each of the new Indian based vendors had to address this problem also. Satyam formed a relationship with the Victorian Government where they were to establish a business entity close to Melbourne. This deal collapsed when Satyam corporate problems surfaced. Delta on the other hand needed to establish a new business relationship with their Indian organisation.

Alpha achieved better quality service outcomes and cost reductions from the offshore arrangements.

Although cost savings were achieved with respect to rates this was only one measure. More was delivered however, the rate charged for delivery accounted for only half the cost. The other half was the internal effort involved in achieving the lower rate. For Alpha the question therefore was: Were the savings greater when the effort involved is taken into account, compared with the previous approach to IT service delivery? If the effort was the same and the rates lower then yes, however if the internal effort was higher then there were no savings. From Alpha's perspective it was successful:

- Alpha achieved improved service levels and quality (a conservative estimate of 15–20 % improvement)
- Targeted cost reductions of approximately (30 %) were achieved. When the company went offshore there were specified target budget reductions for the services and these were achieved.
- Alpha saw little change in the way they performed their business processes with the outsource provider, there was no perceptible increase in effort.
- The Indian vendors had stricter quality control and compliance mechanisms. With stricter process compliance the delivered products were better quality and tested more thoroughly. The offshore vendors, with lower labour costs, spent more time getting the process right. In particular the number of defects was lower and there were fewer incidents in production. Further, the contract pricing included penalties for severity 1 and 2 incidents. The contract pricing did not include any price component for penalties against quality standards. In practice, Infosys consistently met their target levels and avoided penalties.
- Alpha as a mature, experienced player in the outsourcing game ensured better internal management of contracts and vendors. Management costs decreased over time. Alpha managed more closely, often duplicating work at the outset, a trusted relationship developed quickly with the result that overall contract management effort was lower.

7 Conclusion

While the outsourcing of IT services is now common place and has been well studied, there are few longitudinal, historical studies of outsourcing in large organisations. Examining the outsourcing arrangements of a large organisation over an extended period of time provides us with unique insights on the internal and external forces at play, decision-making, and how the organisation learned from previous experiences. Our case study, covering a period of 16 years, highlights how Alpha matured in its approach in sourcing its IT function. In our story we have provided details relating to the external environment and the impact that had on Alpha's IT function which subsequently influenced outsourcing and finally offshore decisions.

Cost reduction was a major driver for the initial outsourcing decisions and, as the company moved to privitisation, cost reductions in the IT budge became even more of an imperative. However as Alpha restructured their IT function there was an acceptance by the organisation that costs were less important, quality and on time delivery of systems were a higher priority. In the decision to use Indian offshore vendors for some IT service provision the company had to carefully manage not only the internal and external pressures but also the relationship with their external stakeholders and their internal business units. While managing offshore arrangements is complex, as the case of Alpha shows, it can be successfully done.

Today Alpha is a very different organisation in terms of its IT function, compared with where it was at the start of its journey in 1996. IT service provision is now provided internally for business critical systems. Non-critical systems support and maintenance is outsourced predominantly offshore and a number of vendors own and maintain other non-critical applications. Alpha today continues to achieve a 70 % + target for outsourced offshore work.

This case study highlights that moving IT services to outsourcing and offshore arrangements is not straightforward. Even for a mature outsource organisation such as Alpha, moving offshore did present challenges and there were unforeseen issues. Yet, as the case shows, offshoring can be an important and effective IT sourcing strategy.

References

Ang, S., & Inkpen, A. (2008). Cultural intelligence and offshore outsourcing success: A framework of firm-level intercultural capability. *Decision Sciences, 39*, 337–358.

Avison, D., & Banks, P. (2008). Cross-cultural (mis)communication in IS offshoring: Understanding through conversation analysis. *Journal of Information Technology, 23*, 249–268.

Barthelemy, J., & Geyer, D. (2004). The determinants of total IT outsourcing: An empirical investigation of French and German firms. *The Journal of Computer Information Systems, 44*, 91–97.

Beulen, E., Tiwari, V., & van Eric, H. (2011). Understanding transition performance during offshore IT outsourcing. *Strategic Outsourcing: An International Journal, 4*, 204–227.

Carmel, E., & Agarwal, R. (2002). The maturation of offshore sourcing of information technology work. *MIS Quarterly Executive, 1*, 65–77.

Derrida, J. (1978). *Writing and difference*. Chicago, IL: University of Chicago Press

Dibbern, J., Golesd, T., Hirschheim, R., & Jayatilaka, B. (2004). Information systems outsourcing: A survey and analysis of the literature. *Database, 35*, 6–102.

Dibbern, J., Winkler, J., & Heinzl, A. (2008). Explaining variations in client costs between software projects offshored to India. *MIS Quarterly, 32*, 333–366.

DiRomualdo, A., & Gurbaxani, V. (1998). Strategic intent for IT outsourcing. *Sloan Management Review, 39*, 67–81.

Fisher, J., Hirschheim, R., & Jacobs, R. (2008). Understanding the outsourcing learning curve: a longitudinal analysis of a large Australian company. *Information Systems Frontiers, 10*, 165–178.

Goo, J. (2010). Structure of service level agreements (SLA) in IT outsourcing: The construct and its measurement. *Information Systems Frontiers, 12*, 185–205.

Gopal, A., Sivaramakrishnan, K., Krishnan, M. S., & Mukhopadhyay, T. (2003). Contracts in offshore software development: An empirical analysis. *Management Science, 49*, 1671–1683.

Hirschheim, R., Heinzl, A., & Dibbern, J. (2002). Information technology outsourcing in the new economy—an introduction to the outsourcing and offshoring landscape. In R. Hirschheim, A. Heinzl , & J. Dibbern (Eds.) *Information systems outsourcing: Enduring themes, new perspectives and global challenges* (pp. 3–23). Berlin: Springer

Ho, V., Ang, S., & Straub, D. (2003). When subordinates become IT contractors: Persistent managerial expectations in IT outsourcing. *Information Systems Research, 14*, 66–125.

Iacovou, C., & Nakatsu, R. (2008). A risk profile of offshore—outsourced development projects. *Communications of the ACM, 51*, 89–94.

Jayatilaka B (2009) Reaching Across Organizational Boundaries for New Ideas: Innovation from IT Outsourcing Vendors. In *Information Systems Outsourcing: Enduring Themes, New Perspectives and Global Challenges*. Hirschheim R, Heinzl A, andDibbern J (ed.), Third edition (ed.), Vol. pp. 255-75. Springer, Berlin.

Joshi, K., & Mudigonda, S. (2008). An analysis of India's future attractiveness as an offshore destination for IT and IT-enabled services. *Journal of Information Technology, 23*, 215–227.

Kotlarsky, J., & Oshri, I. (2005). Social ties, knowledge sharing and successful collaboration in globally distributed system development projects. *European Journal of Information Systems, 14*, 37–48.

Lacity, M. C., Khan, S., Yan, A., & Willcocks, L. P. (2010). A review of the IT outsourcing empirical literature and future research directions. *Journal of Information Technology, 25*, 395–433.

Mahnke, V., Wareham, J., & Bjorn-Andersen, N. (2008). Offshore middlemen: Transnational intermediation in technology sourcing. *Journal of Information Technology, 23*, 18–30.

Mason, R., McKenney, J., & Copeland, D. (1997). Developing an historical tradition in MIS research. *MIS Quarterly, 21*, 257–278.

Mathew, S. K. (2011). Mitigation of risks due to service provider behavior in offshore software development. *Strategic Outsourcing: An International Journal, 4*, 179–200.

Munslow, A. (1997). *Deconstructing History*. New York, NY: Routledge.

Nicholson, B., & Sahay, S. (2004). Embedded knowledge and offshore software development. *Information and Organization, 14*, 329–336.

Palvia, S., Palvia, P., Xia, W., & King, R. (2011). Critical issues of IT outsourcing vendors in India. *Communications of the Association for Information Systems, 29*, 203–219.

Pelsak, A. (2012). Outsourcing and offshore outsourcing of information technology in major corporations. *Management Research Review, 35*, 14–31.

Philip, T., Schwabe, G., & Ewusi-Mensah, K. (2009). Critical issues of offshore software development project failures. *International Conference on Information Systems (ICIS)* (pp. 1–10). Arizona: AIS.

Porra, J., Hirschheim, R., & Parks, M. (2013). The historical research method and information systems research. *Journal of the Association for Information Systems (forthcoming).*

Rai, A., Maruping, L., & Venkatesh, V. (2009). Offshore information systems project success: The role of social indebtedness and cultural characteristics. *MIS Quarterly, 33*, 617–641.

Reynolds, P., & Wilcocks, L. (2009). Building and integrating core IT capabilities in alignment with the business: Lessons from the commonwealth bank 1997–2007. In R. Hirschheim, A. Heinzl, & J. Dibbern (Eds.) *Information systems outsourcing: Enduring themes, new perspectives and global challenges* (3rd ed., pp. 77–103). Berlin: Springer

Rottman, J., & Lacity, M. (2009). A US client's learning from outsourcing IT work offshore. In R. Hirschheim, A. Heinzl, & J. Dibbern (Eds.) *Information systems outsourcing: Enduring themes, new perspectives and global challenges* (3rd ed., pp. 443–69). Berlin: Springer.

Rottman, J. W., & Lacity, M. C. (2008). A US Client's learning from outsourcing IT work offshore. *Information Systems Frontiers, 10*, 259–275.

Schwarz, A., Hirschheim, R., Jayatilaka, B., & Goles, T. (2009). A conjoint approach to understanding IT application services outsourcing. *Journal of the Association for Information Systems, 10*, 748–781.

Smith, H., & McKeen, J. (2004). Developments in practice XIV: IT sourcing—how far can you go? *Communications of the Association for Information Systems, 14*, 508–520.

Topolski, J. (1976). *Methodology of History*. Dordrecht, NL: D. Reidel Publishing Company.

Valorinta, M. (2011). IT alignment and the boundaries of the IT function. *Journal of Information Technology, 26*, 46–59.

Wiener, M., Vogel, B., & Amberg, M. (2010). Information systems offshoring—a literature review and analysis. *Communications of the Association for Information Systems, 2*, 455–489.

Willcocks, L. (2010). The next step for the CEO. *Strategic Outsourcing: An International Journal, 3*, 62–66.

Winkler, J., Dibbern, J., & Heinzl, A. (2009). The impact of cultural differences in offshore outsourcing: Case study results from German–Indian application development projects. In R. Hirschheim, A. Heinzl, & J. Dibbern (Eds.) *Information systems outsourcing: Enduring themes, new perspectives and global challenges* (3rd(ed., pp. 471–95). Berlin: Springer.

Winkler, J., Dibbern, J., & Heinzl, A. (2006). Success in offshoring of application development—does culture matter? *14th European Conference on Information Systems*. Goteburg: Goteborg University.

Zimmermann, A. (2011). Offshoring attitudes, relational behavious and departmental culture. *European Conference on Information Systems.* Helsinki.

Towards Understanding Knowledge Integration in Multi-Sourcing Engagements

Xiaowei Jin, Julia Kotlarsky and Ilan Oshri

Abstract Nowadays organizations are increasingly outsourcing interdependent business processes and IT services to multiple vendors. While practiced broadly, the multi-sourcing model still presents major challenges to both client and vendor firms. In particular, firms struggle with the integration of knowledge between the client firm and providers of interdependent services. Building on the extant literature, this paper develops an integrative view on knowledge integration in multi-sourcing contexts.

Keywords Multi-sourcing · Knowledge integration · Coordination · Outsourcing · Knowledge boundaries

1 Background and Motivation

Multi-sourcing (also referred to as "multi-vendor" or "multi-supplier" sourcing) is the practice when client firms buy interdependent IT and business services from internal and/or external vendors to seek optimal business goals (Bapna et al. 2010; Oshri et al. 2011). The multi-sourcing model is becoming a dominant sourcing model for organizations that rely heavily on third parties to provide IT, business processes and services. Indeed, there is growing evidence that organizations shy away from

X. Jin · I. Oshri
Centre for Global Sourcing and Services, Loughborough School of Business and Economics, Loughborough, Leicestershire LE11 3TU, UK
e-mail: x.jin@lboro.ac.uk

I. Oshri
e-mail: i.oshri@lboro.ac.uk

J. Kotlarsky (✉)
Aston Business School, Aston University, Aston Triangle, Birmingham B4 7ET, UK
e-mail: j.kotlarsky@aston.ac.uk

R. Hirschheim et al. (eds.), *Information Systems Outsourcing*, Progress in IS,
DOI 10.1007/978-3-662-43820-6_11

large-scale long-term contracts with a single vendor to undertake smaller contracts of shorter duration with multiple vendors. A recent Tata Consultancy Services (TCS) report also indicated that more than 90 % of all outsourcing landscapes are multi-vendor.[1] (See examples of multi-vendor engagements in Appendix 1).

There are numerous reasons for client firms to pursue a multi-sourcing model. Multi-sourcing is believed to mitigate risk of failure in outsourcing and allow client firms to benefit from best-of-breed vendors (Cohen and Young 2006). According to Levina and Su (2008) multi-sourcing allows clients to benefit from competition between vendors on price and quality as well as may drive vendors to offer innovation to their clients. However, multi-sourcing does not come easy. It requires a set of managerial capabilities to manage various aspects that amplify in the multi-sourcing setting such as task complexity, task interdependence and workflow integration.

For example, the Royal Dutch Shell's multi-sourcing contract with AT&T, T-Systems and EDS signed in 2008 illustrates the complexity of such deals. In this contract, there are interdependencies between telecommunication networks (AT&T), application storage systems (T-Systems) and infrastructure (EDS) that required vendors to maintain high level of interactions and mitigate risks deriving from interdependencies between the outsourced tasks. Cliff Saran, the managing editor (technology) of Computer Weekly,[2] comments on the complexity in Shell's multi-sourcing contract:

> How does EDS exercise control over AT&T and T-Systems, especially given that certain desktop support functions, such as a roll-out of Windows Vista, is predicated on AT&T's network service? Similarly, how does EDS exercise control over decision support desktop software, which needs to take a data feed from the SAP system, managed by T-Systems. The other dilemma for Shell is how it can trust EDS to deliver the outsourced service if EDS faces a default by one of the other parties?

The above quote illustrates interdependency between the vendors and the client systems in Shell's multi-sourcing deal. Bapna et al. (2010) refer to this unique characteristic of multi-sourcing as *task interdependency* defined as the degree to which the outputs of these different stakeholders affect each other. One implication of such task interdependency is the lack of visibility to each vendor's contribution toward the fulfillment of the interdependent task to the degree that the client firm cannot incentivize or reward, based on the relative contribution of each vendor. No less important is the negative implication of such interdependency where vendors may abuse the lack of exposure of their contribution to shirking responsibilities (Bapna et al. 2010).

---

[1] http://www.tcs.com/resources/white_papers/Pages/evolution-it-service-management-multi-sourcing-world.aspx.

[2] http://www.computerweekly.com/news/2240085620/Shell-offers-lessons-on-outsourcing-contracts.

Despite such challenges, multi-sourcing is still a promising avenue to benefit from the joint contribution of multiple vendors. However, achieving a joint contribution in such settings requires firms to consider the integration of knowledge across the multiple vendors involved, in an attempt to increase awareness about the effect of each vendor's contribution on the multi-sourcing joint effort.

While task interdependency has been discussed in the Information Systems (IS) outsourcing literature, its implication for joint multi-sourcing delivery is still unknown. In particular, the interest of this paper to understand the implications of task dependency for knowledge integration is motivated by the lack of insight into the complexity of the multi-sourcing settings. Therefore, in this paper we seek to understand what knowledge implications arise from task interdependency in multi-sourcing settings. To achieve this objective we review and synthese extant literature on knowledge integration and coordination from a multi-sourcing viewpoint.

2 Knowledge Integration in the Multi-Sourcing Context

Multi-sourcing from the IS viewpoint is dealing with a scenario where a client firm has contracts with several suppliers providing interdependent IT and business services (Carmel and Agarwal 2002; Cullen et al. 2005; Currie 1998; Lacity and Willcocks 1998). Examining the stream of studies on multi-vendor settings reveals that by and large the literature has traditionally focused on issues relating to supply chain management, in particular in the context of manufacturing and retail (Levina and Su 2008). A central stream in the multi-sourcing literature from supply chain management is the risk mitigation strategy which motivates firms to adopt this strategy. While also applicable to the services context, multi-sourcing in IT and business process outsourcing raises additional concerns. For one, multi-sourcing in IT and business processes highlights the complexity in managing interdependencies between tasks that have been outsourced to different vendors (i.e., Bapna et al. 2010). Indeed, the IS literature has already attempted to capture the complexity involved in managing multi-sourcing settings. For example, Su and Levina (2011) offer a typology of multi-sourcing settings in which the *breadth* and *depth* of the multi-sourcing relationships serve as two key dimensions in their framework. The breadth of the supply base reflects on the number of suppliers the focal firm uses for a given business function and the depth of a supply relationship considers the client's level of investment in a particular supply relationship for a given function. Such categorization has advanced our understanding regarding the various types of multi-sourcing types and the investment needed in each category in order to benefit from the multi-sourcing setting. Other studies focus on operational challenges client firms may face when engaging in multi-sourcing settings. For example, (Bapna et al. 2010; Oshri et al. 2011) point out to one fundamental differentiating characteristic of multi-sourcing arrangements from a single vendor deal which is about the interdependency between services or processes contracted

to different vendors. In particular, Bapna et al. (2010) highlight that task interdependencies in multi-sourcing arrangements create challenges associated with the ability to observe and measure the performance of individual vendors when the outcome of a project is dependent on the effort of multiple suppliers.

One possible way to deal with the lack of sight of each vendor's contribution to the joint multi-sourcing effort is the integration of knowledge across the vendor team. However, in integrating such knowledge additional challenges may arise. First, the integration of knowledge often cannot be de-coupled from its context, in particular this is relevant to the knowledge which is tacit and embedded in social and practical contexts (Levina and Vaast 2005; Orlikowski 2002). Further, knowledge boundaries between individuals and teams may emerge, impeding knowledge integration processes (Kotlarsky et al. 2012; Levina and Vaast 2008).

There has been a considerable amount of research on inter-organizational knowledge sharing and collaboration (Myers and Cheung 2008) and knowledge integration in cross-functional teams (Kellogg et al. 2006; Majchrzak et al. 2012), which is relevant to the multi-sourcing environment. Although the literature on knowledge integration is extensive, the concept has been defined in various ways. For example, knowledge integration is defined as "the process of combining, applying, and assimilating disparate specialized knowledge" (p. 264) stressing the integration activities as a series of processes of knowledge identification and reconfiguration that leads to creating new knowledge (Berggren et al. 2011). Others view knowledge integration as the process of transferring, translating and transforming knowledge (Carlile 2004). Knowledge integration is also defined as "the capabilities to bring together and combine knowledge elements to perform innovative activities" (Dibiaggio and Nasiriyar 2009, p. 268). Further, knowledge integration can be studied at the project or cross-functional team level (e.g. Majchrzak et al. 2012), depending on the level of impact expected from the integration of knowledge.

As multi-sourcing arrangements involve multiple vendors that typically come from different knowledge domains, we perceive the knowledge integration to take place on inter-organizational and cross-functional levels. As such, knowledge integration is the synthesis of specialized knowledge into situation-specific systemic knowledge. Further, the challenges involved in knowledge integration concern "overcoming barriers to the flow and transfer of knowledge arising from pre-existing divisions of practice among team members" (Scarbrough et al. 2004, p. 1582).

Having examined the complexity involved in knowledge integration in multi-sourcing settings, we now examine antecedents of knowledge integration such settings.

3 Antecedents of Knowledge Integration in Multi-Sourcing

3.1 Knowledge Boundaries

There are different views about the effect of common knowledge on knowledge integration. Some researchers claim that common knowledge, defined as "a resource for mobilizing knowledge across practice boundaries that has most resonance with our work on inter-professional collaborations" (Edwards 2012, p. 25) is a prerequisite for integrating knowledge (Grant 1996b). Others claim that common knowledge can be kept to a minimum, while maintaining an efficient knowledge integration (Berggren et al. 2011). For instance, a team with high knowledge heterogeneity is more likely to absorb external knowledge from multiple domains (Cohen and Levinthal 1990). Therefore possessing high levels of knowledge heterogeneity (Tiwana and McLean 2005) may enable the integration of external knowledge (Zahra and George 2002). Excessive heterogeneous knowledge may in fact result in a lack of common knowledge for team members from diverse functional areas, and the pertinence of one another's knowledge can be difficult to identify. Consequently, barriers to knowledge integration may arise. Such barriers are associated with knowledge boundaries that individuals from different areas of practice will encounter when attempting to integrate their differentiated knowledge.

In the multi-sourcing context, members of diverse teams usually possess different business and technical knowledge which leads to differences in viewpoints, languages and symbols (Rico et al. 2008). Considering that interdependency between services provided by different vendors is a key characteristic of multi-sourcing (Bapna et al. 2010), multi-vendor arrangements require to not only spanning across functional and technological domains but also overcoming various knowledge boundaries. As such, the nature of the knowledge integration is between firms where boundaries are rather salient as a result of vendor specialization and the high degree of the vendor's knowledge heterogeneity (Tiwana and McLean 2005). Heterogeneous specialized knowledge in multi-sourcing may result in a lack of common knowledge between project members from varying functional areas, thus making the process of knowledge integration rather difficult. According to Carlile (2004), knowledge boundaries are known as syntactic (i.e., differences in lexicon), semantic (i.e., differences in interpretations) and pragmatic (i.e., differences in interests) boundaries. It flows from the above that:

Proposition 1 In a multi-sourcing arrangement, the syntactic, semantic, and pragmatic knowledge boundaries between the client and multiple vendors will impede the development of common ground among partners, thereby will negatively influence the knowledge integration process.

3.2 Team Identification

Literature also posits that social identity, collaborative environment, and collective beliefs may influence the knowledge integration process. For example, shared values and behaviors encourage employees to concentrate on corporate interests, and this in turn affects the ability, motivation and opportunity to achieve knowledge integration (Argote et al. 2003; Kogut and Zander 1992). Smith et al. (2005) illustrate how the collective teamwork environment positively affects knowledge creativity, including knowledge integration. Similarly, cultural awareness, the cultural norms and beliefs of a team, has been proposed as having a positive impact on knowledge integration processes in global R&D networks (Erkelens et al. 2010).

As research expanded our understanding regarding the links between social factors and knowledge processes, Ahuja et al. (2011) discovered that team identification (the degree to which team members identify with the whole team) positively affect knowledge integration.

Examining these insights in the context of outsourcing, we posit that members representing different vendors involved in multi-sourcing will face a challenge when attempting to create a joint team identity when trying to develop cross-vendor identification and enhance the emotional bond between members of the multi-vendors team. Past studies also hint at the tendency of inter-organizational teams to gravitate towards their "local" interest rather than the "global" goals, thus failing to develop identification with the multi-vendor teams (Lembke and Wilson 1998). In such contested terrain, we posit that vendors in multi-sourcing settings need to foster a team identity to benefit from joint commitment and a shared goal. Therefore we propose the following:

Proposition 2 Fostering (a higher level of) identification within a multi-vendor project team will facilitate the knowledge integration process by mitigating the diversity of individual interests and goals.

3.3 Relational Proximity

There is evidence that relational (trust and identity) and structural (cohesion) embeddedness affect knowledge integration (Erkelens et al. 2010). The network structure (i.e., of team, project, organization, and industry) and its social density contribute to developing trust, thus facilitating the sharing of information within a network (Coleman 1988).

Drawing from these studies to the context of the multi-vendor environment, we assert that strong relationships between members of multi-vendor teams are likely to improve their interactions and the quality of communications, leading to better knowledge integration. Indeed, strong relationships among team members enhance

the perceived validity of communications by shaping the cognitive structure of communications between team members (Gardner et al. 2012). As such, the "perspective-taking" ability developed by members of the team (Krauss and Fussell 1990) may advance better understanding across the multiple teams and increase awareness regarding the area of responsibility of each vendor (Gardner et al. 2012). Strong relationships among members of a multi-sourcing team may also lead to a higher degree of participation and motivation to engage in joint-problem solving (Gardner et al. 2012). Thus, we propose the following:

Proposition 3 Strong relationships between multi-sourcing partners will positively affect the knowledge integration process by facilitating reciprocal trust and improving on-going communications.

3.4 Task Attributes

There has also been evidence about the link between the complexity and uncertainty of tasks and the ability to integrate their embedded knowledge (e.g. Ahuja et al. 2011; Grant 1996a; Stock and Tatikonda 2008). For instance, Ahuja et al. (2011) demonstrates that, in a highly complex process such as software development, the more complex the project requirements are, the more difficult it is to integrate its relevant knowledge. Clearly, uncertainty emanating from unclear project requirements and unfamiliar technologies (Berggren et al. 2011) are likely to negatively affect the quality of specifications, which in turn will worsen the outcomes of the knowledge integration process.

In a multi-sourcing engagement, the modularity and complexity of outsourced tasks is likely to influence knowledge integration between the client and vendors. More specifically, the sourcing contract, in which integration terms and intended objectives are outlined will very likely increase accountability of the vendors, pushing them to invest in integration processes. For instance, if modularity of the multi-sourcing task is high, its ownership and control could be easily transferred among vendors through clearly defined specific performance standards (Bapna et al. 2010). However, if modularity of task is low, or the task is more complex and uncertain, the client's ability to observe and measure the individual contribution of each vendor decreases. Consequently, the client would find it difficult to establish reward and penalty mechanisms based on individual performance of vendors. Therefore, we propose the following:

Proposition 4 The ability to observe and/or measure contributions of different vendors to the joint outcome of the multi-sourcing arrangement will increase motivation and accountability of vendors engaging in integrating knowledge.

4 Coordination as a Facilitator of Knowledge Integration in Multi-Sourcing

This section discusses the role of coordination mechanisms in facilitating the knowledge integration in the multi-sourcing context. Central to the coordination literature is the notion of task interdependencies in collaborative activities (Crowston 1997). Early studies focus on developing a typology for resource-based dependencies as well as workflow management, defining interdependencies as "constraints on the occurrence and temporal order of the certain significant events" (Attie et al. 1996, p. 224). We adopt the view of the relationship between the challenge of task interdependency and the possible solution through coordination to suggest that *coordination* is "the integration of organizational work under conditions of task interdependence and uncertainty" (Faraj and Xiao 2006, p. 1156).

Classical coordination theory identifies different types of coordination mechanisms many of which has been studied as dyads, e.g., plan versus feedback, impersonal versus mutual adjustment, formal versus informal, programmed versus nonprogrammer. In the recent review of coordination literature Okhuysen and Bechky (2009) identify five different types of mechanisms that encapsulate how emergent practices assist in coordination: (1) plans and rules; (2) objects and representations; (3) roles; (4) routines; and (5) proximity. This review also suggest three outcomes of coordinative action—*accountability* that makes clear who is responsible for each element of the task, *predictability* that enables independent actors to anticipate subsequent task-related activities and *common understanding* that provides a shared perspective on the whole task—which are the means by which people collectively accomplish their interdependence tasks in the workplace (Okhuysen and Bechky 2009, p. 483). As Okhuysen and Bechky (2009) note, current coordination theory has studied different *objects* of coordinative action, among them *task* (the most common one), and *knowledge* (Majchrzak et al. 2007) that received more attention in recent years.

To understand the role of coordination mechanisms in multi-sourcing, we consider coordinative efforts aimed at integrating knowledge in inter-organizational settings. However, coordination in multi-sourcing settings goes beyond the sequential coordination of rules to actually enhanced flexibility (Okhuysen and Bechky 2009) required to deal with uncertainty, novelty and problem complexity. As mentioned earlier, the highly specialized knowledge each vendor possesses is likely to challenge team members when attempting to sequence their activity.

Indeed recent years have witnessed growing interest in unconventional and ad hoc forms of organizing (e.g. globally distributed and virtual teams). In the context of outsourcing Sabherwal (2003) identified 22 coordination mechanisms summarized in four categories: (1) standards, (2) plans, (3) formal mutual adjustment, and (4) informal mutual adjustment. This study compares the client and vendor's perspectives on coordination and claims that coordination mechanisms adopted by client and vendor firms are different, more specifically, informal coordination is

preferred by clients while standards and plans are commonly adopted in vendor firms. Therefore, we propose:

Proposition 5 In a multi-sourcing arrangement, client and vendor firms will need to develop a jointly acceptable set of coordination mechanisms. These coordination mechanisms will be successful if they, on the one hand, capture a common understanding of the collaborative outcome (i.e., the joint goal translated into agreed terminology), and, on the other hand, reflect the individual goals of each individual party.

In practical terms, this proposition means that outcomes delivered by individual vendors should be included as (partial) input in the joint coordination mechanisms that are understood and accepted by all parties involved.

Another recent development in the coordination literature has emphasized the management of interdependencies and coordinating of knowledge (Faraj and Xiao 2006; Srikanth and Puranam 2011) through tacit coordination mechanisms, such as reliance on pre-project familiarity among team members, shared knowledge of each other's work procedures, and visibility of information (Srikanth and Puranam 2011). Such coordination practices are designed to enhance the common ground among interdependent groups that are involved in a collaborative task (Bechky 2003; Majchrzak et al. 2012). In particular, conversational interactions are reported as an important mechanism to coordinate work and knowledge in socially structured settings (Bechky 2003; Carlile 2004). This approach also enhances the negotiation of cross-functional understanding, and facilitates the new knowledge generation in organizations (Tsoukas 2009). In light of the above observations, we suggest the following:

Proposition 6 Adopting tacit coordination mechanisms among parties involved in the multi-sourcing arrangement will help to deal with knowledge boundaries, and will be positively associated with knowledge integration. This in turn will have a positive impact on the multi-sourcing performance.

It has been established that the adoption of ICT in outsourcing leads to better coordination as it facilitates knowledge sharing among the outsourcing partners. In addition, the use of a variety of ICT in a project is likely to improve knowledge transfer and enhance knowledge integration. Indeed, various technological aspects and artifacts were examined in the context of knowledge processes such as communication platforms, knowledge channels, infrastructure diversity, and the extent of technology usage. For example, Balaji and Ahuja (2005) found that the integration of internal and external knowledge is enhanced as a result of the extent of technological deployment and use. Others have emphasized the role that the communication platform plays in knowledge integration, indicating its positive contribution to interactions between members of teams (Hung et al. 2008). On the other hand, evidence suggests that the lack of commonality in technological infrastructures between the client and vendors results in an increased complexity to

achieve smooth communications (e.g. Ahuja et al. 2011). While it is commonly accepted that IT infrastructure plays a major role in supporting communications and the coordination of work in dispersed teams (Kotlarsky et al. 2008), it has become evident that integrating multiple technological infrastructures is rather challenging. Recent studies, however, highlight the role that visual representations play in supporting knowledge integration through blueprints, diagrams, drawing in which different parties can upload visual representations associated with their specialized knowledge into joint virtual space. Termed "trading zones" (Kellogg et al. 2006), such a technological infrastructure in the form of a joint online space that facilitates the coordination of knowledge across boundaries. Therefore, we extrapolate to the multi-sourcing setting the following:

Proposition 7 The ability of different parties involved in the multi-sourcing arrangement to create joint online spaces will have a positive effect on knowledge integration, as it will streamline communications and introduce joint structures for the sharing of knowledge.

5 Outcomes of Knowledge Integration in Multi-Sourcing

Multiple studies have produced empirical evidence that links knowledge integration with improved performance. For example, Patnayakuni and Ruppel (2006) show that the ability to integrate tacit knowledge positively affects development performance. Indeed there are numerous studies, on the firm level, that report the positive impact of knowledge integration on product time-to-market, user satisfaction, and a firm's dynamic capabilities (Berggren et al. 2011).

In projects that involve multiple parties, knowledge integration has a strong, positive influence on alliance performance[3] (Tiwana 2008) which is relevant to understanding the implications for multi-sourcing projects.

Innovation has also been identified as one important outcome of knowledge integration (Dibiaggio and Nasiriyar 2009). In particular, knowledge integration has been found to facilitate product innovation (De Luca and Atuahene-Gima 2007), radical innovation (Zhou and Li 2012), and the firm's innovative capability (Tushman and O'Reilly 2006). Furthermore, Tiwana and McLean (2005) argue that team creativity in information systems development projects is one outcome of knowledge integration. It is also reported that teams that involve members from different organizations or different knowledge domains integrate complementary knowledge which in turn enhances innovative performance (Dibiaggio and Nasiriyar 2009). Bringing these observations together we posit the following:

[3] Tiwana (2008) assesses alliance performance through alliance ambidexterity which is "the capacity to simultaneously exhibit alignment with alliance objectives and adaptiveness to changes in the environment" (Tiwana 2008, p. 253).

Proposition 8 The integration of knowledge between multi-sourcing partners will improve joint (multi-sourcing) performance, and will facilitate innovation in the multi-sourcing arrangement. While the client is likely to be the main party to benefit from such innovation, vendor firms will be able to benefit as well by adopting innovative approaches or outcomes into their practices.

6 Implications for Theory and Practice

6.1 Theoretical Implications

This paper examines the implications for task interdependency knowledge integration in multi-vendor settings. We argue that, first, task interdependency calls for a higher degree of coordination among vendors. Second, the complexity of the multi-vendor setting in which members of multi-vendor team possess different expertise is likely to result in salient boundaries, hampering efforts to coordinate work. Third, in the multi-sourcing setting high task complexity and uncertainty make it challenging for the client to introduce rewards or penalties for individual vendors.

The man contribution of this paper is to IS outsourcing literature, as it aims to understand links between task interdependencies, knowledge integration, coordinative mechanisms and multi-sourcing performance. Although the outsourcing literature has examined a wide range of knowledge-related issues (Leonardi and Bailey 2008; Levina and Vaast 2005; Oshri et al. 2008; Vlaar et al. 2008), the multi-sourcing context has not been examined from a knowledge perspective. In this regard, we contribute to the growing literature on knowledge processes in IS outsourcing. Furthermore, this paper responds to the assertion by Bapna et al. (2010) that the current dyadic client-vendor outsourcing literature is not sufficient to observe the nuances of multi-sourcing. We expand the rather limited literature on multi-sourcing which currently examines sourcing configurations and strategy (Levina and Su 2008; Su and Levina 2011), contract management or relationship issues (Herz et al. 2010) by conceptualizing the complexity in multi-sourcing arrangements, from a knowledge process perspective. The propositions offered in this paper open new avenues for empirical research on the antecedents and coordination mechanisms relevant for the multi-sourcing setting and the impact of outsourcing performance.

6.2 Managerial Implications

Our research offers managers several insights about the factors affecting performance in multi-sourcing settings. In particular, we highlight the need to integrate knowledge across multiple vendors to ensure the development of awareness of who

is doing what and how one vendor's outcome may negatively affect the performance of another. Propositions formulated in this paper should guide managers from client and vendor firms in designing their multi-vendor engagements.

Appendix 1: Examples of Multi-Sourcing

Vendor	Services provided
P&G' global business services	
HP	The development of IT applications and the operation of data centers and IT support
IBM	Employee services (e.g. payroll, travel support, expatriate services, etc.)
Jones Lang LaSalle(JLL)	The management of offices and technical centers, including their maintenance
British petroleum (BP)'s IT services	
Accenture	Management and development of SAP system
IBM	Service desk support
TCS, Infosys and Wipro	Support and develop applications for business units in the BP oil and gas supply chain
General motors (GM)'s IT services	
EDS	Mainframes, servers, desktops, LAN operations, and application integration and management
HP	Server management and enterprise application integration and management
Capgemini	Enterprise application integration and management
IBM	Enterprise application integration and management
Compuware Covisin	Unspecified contract value to support the business-to-business supply chain
Wipro Technologies	Unspecified contract value to support middleware applications and data integration
Ministry of justice (MoJ)'s shared services program	
Steria	Common back-office operating platform
Savvis	Hosting services on an infrastructure-as-a-service basis
Accenture	Leading systems integration
ABN Amro's IT services	
IBM	Bank's global IT Infrastructure, including servers, storage and desktops
Infosys, TCS and Patni	Application support and enhancements
Accenture	Application development
Open to competitive bidding among the five vendors	New application development

References

Ahuja, M., Sinclair, R., & Sarker, S. (2011). *The influence of outsourcing models on vendor knowledge integration*. Paper presented at the PACIS 2011.

Argote, L., McEvily, B., & Reagans, R. (2003). Managing knowledge in organizations: An integrative framework and review of emerging themes. *Management Science, 49*(4), 571–582.

Attie, P. C., Singh, M. P., Emerson, E. A., Sheth, A., & Rusinkiewicz, M. (1996). Scheduling workflows by enforcing intertask dependencies. *Distributed Systems Engineering, 3*(4), 222–238.

Balaji, S., & Ahuja, M. K. (2005). *Critical team-level success factors of offshore outsourced projects: A knowledge integration perspective*. *The 38th Hawaii International Conference on Systems Sciences.*

Bapna, R., Barua, A., Mani, D., & Mehra, A. (2010). Research commentary: Cooperation, coordination, and governance in multisourcing: An agenda for analytical and empirical research. *Information Systems Research, 21*(4), 785–795.

Bechky, B. A. (2003). Sharing meaning across occupational communities: The transformation of understanding on a production floor. *Organization Science, 14*(3), 312–330.

Berggren, C., Bergek, A., Bengtsson, L., Söderlund, J., & Hobday, M. (2011). *knowledge integration and innovation: Critical challenges facing international technology-based firms*. Oxford: Oxford University Press.

Carlile, P. R. (2004). Transferring, translating, and transforming: An integrative framework for managing knowledge across boundaries. *Organization Science, 15*(5), 555–568.

Carmel, E., & Agarwal, R. (2002). The maturation of offshore sourcing of information technology work. *MIS Quarterly Executive, 1*(2), 65–77.

Cohen, L., & Young, A. (2006). *Multisourcing: Moving beyond outsourcing to achieve growth and agility*. Boston: Harvard Business Press.

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly, 35*(1), 128–152.

Coleman, J. S. (1988). Social capital in the creation of human capital. *American journal of sociology, 94*, 95–120.

Crowston, K. (1997). A coordination theory approach to organizational process design. *Organization Science, 8*(2), 157–175.

Cullen, S., Seddon, P. B., & Willcocks, L. P. (2005). IT outsourcing configuration: Research into defining and designing outsourcing arrangements. *The Journal of Strategic Information Systems, 14*(4), 357–387.

Currie, W. L. (1998). Using multiple suppliers to mitigate the risk of IT outsourcing at ICI and Wessex water. *Journal of Information Technology, 13*(3), 169–180.

De Luca, L. M., & Atuahene-Gima, K. (2007). Market knowledge dimensions and cross-functional collaboration: Examining the different routes to product innovation performance. *Journal of Marketing, 71*(1), 95–112.

Dibiaggio, L., & Nasiriyar, M. (2009). Knowledge integration and vertical specialization in the semiconductor industry. *European Management Review, 6*(4), 265–276.

Edwards, A. (2012). The role of common knowledge in achieving collaboration across practices. *Learning, Culture and Social Interaction, 1*(1), 22–32.

Erkelens, R., Hooff, B., Vlaar, P., & Huysman, M. (2010). Knowledge integration in global R&D networks. In I. Oshri, & J. Kotlarsky (Eds.), *Global sourcing of information technology and business processes* (pp. 82–102). New York: Springer.

Faraj, S., & Xiao, Y. (2006). Coordination in fast-response organizations. *Management Science, 52*(8), 1155–1169.

Gardner, H. K., Gino, F., & Staats, B. R. (2012). Dynamically integrating knowledge in teams: Transforming resources into performance. *Academy of Management Journal, 55*(4), 998–1022.

Grant, R. M. (1996a). Prospering in dynamically-competitive environments: Organizational capability as knowledge integration. *Organization Science, 7*(4), 375–387.

Grant, R. M. (1996b). Toward a knowledge-based theory of the firm. *Strategic Management Journal*, *17* (Winter Special Issue), 109–122.

Herz, T. P., Hamel, F., Uebernickel, F., & Brenner, W. (2010). *Deriving a research agenda for the management of multisourcing relationships based on a literature review*. *AMCIS 2010 Proceedings.*

Hung, H. F., Kao, H. P., & Chu, Y. Y. (2008). An empirical study on knowledge integration, technology innovation and experimental practice. *Expert Systems with Applications, 35*(1–2), 177–186.

Kellogg, K. C., Orlikowski, W. J., & Yates, J. A. (2006). Life in the trading zone: Structuring coordination across boundaries in postbureaucratic organizations. *Organization Science, 17*(1), 22–44.

Kogut, B., & Zander, U. (1992). Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization Science, 3*(3), 383–397.

Kotlarsky, J., van den Hooff, B., & Houtman, L. (2012). Are we on the same page? Knowledge boundaries and transactive memory system development in cross-functional teams. *Communication Research,* 1–26. doi:10.1177/0093650212469402.

Kotlarsky, J., Van Fenema, P. C., & Willcocks, L. P. (2008). Developing a knowledge-based perspective on coordination: The case of global software projects. *Information and Management, 45*(2), 96–108.

Krauss, R. M., & Fussell, S. R. (1990). Mutual knowledge and communicative effectiveness. In G. Jolene, E. K. Robert, & E. Carmen (Eds.), *Intellectual teamwork* (pp. 111–145). Mahwah: L. Erlbaum Associates Inc.

Lacity, M. C., & Willcocks, L. P. (1998). An empirical investigation of information technology sourcing practices: Lessons from experience. *MIS Quarterly, 22*(3), 363–408.

Lembke, S., & Wilson, M. G. (1998). Putting the "team" into teamwork: Alternative theoretical contributions for contemporary management practice. *Human Relations, 51*(7), 927–944.

Leonardi, P. M., & Bailey, D. E. (2008). Transformational technologies and the creation of new work practices: Making implicit knowledge explicit in task-based offshoring. *MIS Quarterly, 32*(2), 411–436.

Levina, N., & Su, N. (2008). Global multisourcing strategy: The emergence of a supplier portfolio in services offshoring. *Decision Sciences, 39*(3), 541–570.

Levina, N., & Vaast, E. (2005). The emergence of boundary spanning competence in practice: Implications for implementation and use of information systems. *MIS Quarterly, 29*(2), 335–363.

Levina, N., & Vaast, E. (2008). Innovating or doing as told? Status differences and overlapping boundaries in offshore collaboration. *MIS Quarterly, 32*(2), 307–332.

Majchrzak, A., Jarvenpaa, S. L., & Hollingshead, A. B. (2007). Coordinating expertise among emergent groups responding to disasters. *Organization Science, 18*(1), 147–161.

Majchrzak, A., More, P. H. B., & Faraj, S. (2012). Transcending knowledge differences in cross-functional teams. *Organization Science, 23*(4), 951–970.

Myers, M. B., & Cheung, M. S. (2008). Sharing global supply chain knowledge. *MIT Sloan Management Review, 49*(4), 67–73.

Okhuysen, G. A., & Bechky, B. A. (2009). Coordination in organizations: An integrative perspective. *The Academy of Management Annals, 3*(1), 463–502.

Orlikowski, W. J. (2002). Knowing in practice: Enacting a collective capability in distributed organizing. *Organization Science, 13*(3), 249–273.

Oshri, I., Kotlarsky, J., & Willcocks, L. (2011). *The handbook of global outsourcing and offshoring* (2nd ed.). England: Palgrave Macmillan.

Oshri, I., van Fenema, P. C., & Kotlarsky, J. (2008). Knowledge transfer in globally distributed teams: the role of transactive memory. *Information Systems Journal, 18*(6), 593–616.

Patnayakuni, R., & Ruppel, C. P. (2006). Managing the complementarity of knowledge integration and process formalization for systems development performance. *Journal of the Association for Information Systems, 7*(8), 545–567.

Rico, R., Sanchez-Manzanares, M., Gil, F., & Gibson, C. (2008). Team implicit coordination processes: A team knowledge-based approach. *Academy of Management Review, 33*(1), 163–184.

Sabherwal, R. (2003). The evolution of coordination in outsourced software development projects: A comparison of client and vendor perspectives. *Information and Organization, 13*(3), 153–202.

Scarbrough, H., Swan, J., Laurent, S., Bresnen, M., Edelman, L., & Newell, S. (2004). Project-based learning and the role of learning boundaries. *Organization Studies, 25*(9), 1579–1600.

Smith, K. G., Collins, C. J., & Clark, K. D. (2005). Existing knowledge, knowledge creation capability, and the rate of new product introduction in high-technology firms. *The Academy of Management Journal, 48*(2), 346–357.

Srikanth, K., & Puranam, P. (2011). Integrating distributed work: Comparing task design, communication, and tacit coordination mechanisms. *Strategic Management Journal, 32*(8), 849–875.

Stock, G. N., & Tatikonda, M. V. (2008). The joint influence of technology uncertainty and interorganizational interaction on external technology integration success. *Journal of Operations Management, 26*(1), 65–80.

Su, N., & Levina, N. (2011). Global multisourcing strategy: Integrating learning from manufacturing into IT service outsourcing. *IEEE Transactions on Engineering Management, 58*(4), 717–729.

Tiwana, A. (2008). Do bridging ties complement strong ties? An empirical examination of alliance ambidexterity. *Strategic Management Journal, 29*(3), 251–272.

Tiwana, A., & McLean, E. R. (2005). Expertise integration and creativity in information systems development. *Journal of Management Information Systems, 22*(1), 13–43.

Tsoukas, H. (2009). A dialogical approach to the creation of new knowledge in organizations. *Organization Science, 20*(6), 941–957.

Tushman, M. L., & O'Reilly, C. A. (2006). Ambidextrous organizations: Managing evolutionary and revolutionary change. *Managing Innovation and Change*.

Vlaar, P. W. L., van Fenema, P. C., & Tiwari, V. (2008). Cocreating understanding and value in distributed work: how members of onsite and offshore vendor teams give, make, demand and break sense. *MIS Quarterly, 32*(2), 227–255.

Zahra, S. A., & George, G. (2002). Absorptive capacity: A review, reconceptualization, and extension. *Academy of Management Review, 27*(2), 185–203.

Zhou, K. Z., & Li, C. B. (2012). How knowledge affects radical innovation: Knowledge base, market knowledge acquisition, and internal knowledge sharing. *Strategic Management Journal, 33*(9), 1090–1102.

Who Is the Favored Bride? Challenges in Switching to a Multi-vendor Offshoring Strategy

Martin Wiener and Carol S. Saunders

Abstract This chapter explores the governance benefits and challenges that arise when a client firm switches from a single- to a multi-vendor offshoring strategy. It also looks at the management tactics that firms use for dealing with the arising challenges. To do so, we examine the case of a global corporation, which recently took the decision to onboard two additional offshore vendors after having worked exclusively with an Indian IT vendor for more than a decade.

Keywords IT single- versus multi-sourcing · Multi-vendor offshoring (MVO) · MVO benefits · MVO challenges · Management tactics

1 Introduction

IT offshoring refers to the relocation of IT services to vendors located in foreign countries, mainly low-cost countries such as India (Carmel and Tjia 2005; Holmström Olsson et al. 2008). From the late 1990s, companies worldwide started to increasingly engage in offshore activities, primarily to cut costs and get access

M. Wiener (✉) · C.S. Saunders
Dr. Theo and Friedl Schöller Research Center for Business and Society,
University of Erlangen-Nuremberg, Erlangen, Germany
e-mail: martin.wiener@fau.de

C.S. Saunders
e-mail: csaunders@bus.ucf.edu

M. Wiener
Department of Management and Organization, Stockholm School of Economics,
P.O Box 6501, 11 383 Stockholm, Sweden

C.S. Saunders
Department of Management, University of Central Florida,
P.O Box 161400, Orlando, FL 32816-1400, USA

R. Hirschheim et al. (eds.), *Information Systems Outsourcing*, Progress in IS,
DOI 10.1007/978-3-662-43820-6_12

to skilled and qualified IT resources (Dibbern et al. 2008). Nowadays, IT offshoring represents a well-established business practice.

The increasing proliferation of IT offshoring practices seems to be closely related to the emergence of new IT sourcing strategies, as reflected in the significant transformation the global IT outsourcing market has undergone over the last decade (Bapna et al. 2010): Early outsourcing arrangements were typically characterized by long-term contracts with a strategic (domestic) outsourcing partner (for example, General Motor's ten-year outsourcing contract with EDS). In contrast, more recent outsourcing deals often involve multiple, geographically dispersed vendors and run over a shorter time span (e.g., Dutch banking giant ABN AMRO's five-year deal with Accenture, IBM, Infosys, Patni Computer Systems, and Tata Consultancy Services). This so-called multi-sourcing, the umbrella term that includes multi-vendor offshoring, is a situation when a client firm sources IT services and projects from multiple (offshore) vendors (Cohen and Young 2006; Levina and Su 2008).

According to Bapna et al. (2010), multi-sourcing "represents the leading edge of modern organizational forms" (p. 785). Recent studies confirm that multi-sourcing is a growing trend because of the risks of failure associated with single-souring (Bhattacharya et al. 2012). More specifically, a multi-sourcing strategy is expected to allow client firms to access a broader vendor skill set, to lower IT service costs due to competition among vendors, to reduce opportunistic rent appropriation by any vendor, as well as to better adapt to changing market conditions (Bapna et al. 2010; Cohen and Young 2006; Levina and Su 2008).

Despite these obvious benefits, multi-sourcing also creates significant governance challenges. However, so far, research on multi-sourcing governance and the associated challenges still remains scarce. Rather, prior research on IT outsourcing and offshoring has focused almost exclusively on the governance of dyadic client-vendor relationships (e.g., Choudhury and Sabherwal 2003; Dibbern et al. 2008; Goo et al. 2009). While many of the governance challenges identified in such relationships might even be escalated in multi-sourcing contexts, the latter also adds many new challenges not encountered in single-sourcing contexts (Bapna et al. 2010). Thus, the straightforward exploration of prior research findings falls short of addressing the specific and nuanced governance challenges that arise when multiple vendors, who are competitors, have to cooperate to achieve the client's business objectives.

To address this gap in earlier literature, the study at hand explores the governance challenges that arise when a client firm switches from a single- to a multi-vendor offshoring strategy. It also looks at the management tactics that firms use for dealing with the arising challenges. To do so, we examine the case of a global corporation, which recently took the decision to onboard two additional offshore vendors after having worked exclusively with an Indian IT vendor for more than a decade.

2 Theoretical Conceptualization and Background

2.1 Multi-vendor Offshoring

Before the emergence of *multi-sourcing* (also referred to as multi-vendor sourcing), basic sourcing options in practice were typically classified along the following two dimensions (e.g., Holmström Olsson et al. 2008): The first dimension is about sourcing governance, i.e., whether an activity is performed by an organization itself (in-house) or by another organization (outsourced). The second dimension is about sourcing location, i.e., whether an activity is performed in the same locale (onshore) or in a foreign locale (offshore). Here, multi-sourcing adds a third dimension, which is about the number of sourcing partners.

One of the first IT multi-sourcing arrangements was Eastman Kodak's landmark decision to outsource its IT operations to IBM, Digital Equipment Corporation (DEC), and Businessland back in 1989. The "Kodak deal" drastically changed the way CIOs worked and created a boom in the outsourcing sector. While subsequent IT outsourcing deals primarily involved single-vendor arrangements, since the early 2000s, the growth of multi-sourcing activities has been tremendous (see Fig. 1). For instance, in March 2005, French carmaker Renault awarded outsourcing contracts to Atos Origin, CSC and Hewlett Packard. A short time later, Dutch Bank ABN AMRO signed an IT multi-sourcing deal over $2.2 billion with five vendors (Accenture, IBM, Infosys, Patni, and Tata) in Fall 2005. According to Gartner, this deal was expected to result in cost savings of more than $700 million by 2007, in part by cutting 1,500 jobs and transferring 2,000 jobs to the outsourcing vendors. Soon thereafter, several other client firms, such as Royal Dutch/Shell Group, Bank of America, and ING Group, announced major multi-sourcing deals.

In our study, we focus on *multi-vendor offshoring* (MVO), which refers to the delegation of IT services to multiple offshore vendors who must, at least partly, work collaboratively to achieve the client's business objectives (Bapna et al. 2010). In practice, several forms or models of MVO emerged (e.g., Nagle and Maughan 2008): In a "pure" MVO model, the client itself is responsible for managing the relationships with all of its offshore vendors. In an alternative model, the client selects one of its vendors as a so-called "guardian vendor" (Bapna et al. 2010). Beside task-related responsibilities, the guardian vendor also acts as the primary contact for the client and, in turn, coordinates the other vendors on behalf of the client. For example, ABN AMRO and Shell Group decided to use a guardian vendor model in their recent MVO initiatives (Deloitte 2006). Similarly, the client may involve an "offshore middleman" (Mahnke et al. 2008) such as a consulting firm or a nearshore vendor to broker or intermediate the relationship with its offshore vendor(s). For instance, Holmström Olsson et al. (2008) study two-stage offshoring arrangements where Irish sites act as a "bridge" between U.S. client firms and Indian offshore vendors. This so-called two-stage offshoring may soon become multi-stage offshoring (ibid) as Indian vendors have recently started to shift offshore work to even lower-cost destinations, such as China, Vietnam, and Malaysia.

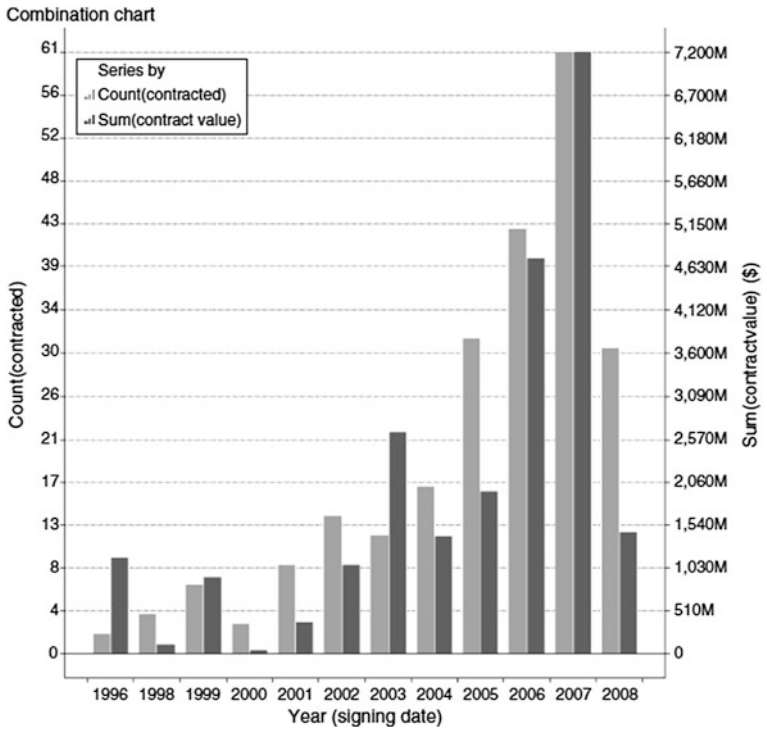


Fig. 1 Growth of multi-sourcing 1996–2008 (Bapna et al. 2010)

In terms of governance complexity, the use of a guardian vendor or "bridged" MVO model is, in principle, very similar to a single-sourcing setup. This is because, in these models, the client is only responsible for managing the dyadic relationship with the guardian vendor and the intermediary, respectively. In our study, we therefore focus on the governance of a pure MVO model, where the client directly interacts with all of its multiple vendors.

2.2 MVO Benefits and Challenges

An increasing number of companies, especially those that already possess considerable experience with "traditional" outsourcing and offshoring (Bapna et al. 2010), are starting to source their IT from multiple vendors. In doing so, companies intend to lower their IT service costs, obtain best-of-breed services for improving their agility, and reduce operational and strategic risks (Cohen and Young 2006). In particular, the adoption of a MVO strategy helps client firms to secure themselves from the risks associated with outsourcing to a single vendor. Such risks include inappropriate vendor selection, vendor lock-in, opportunistic vendor behavior, and

Table 1 Key MVO challenges

Challenge	Short description	References
Increase in management overhead	Additional transaction costs arise from negotiating and enforcing the contract, developing the relationship, etc. with each individual vendor	Carmel and Agarwal (2002)
		Choi and Krause (2006)
		Levina and Su (2008)
		Nagle and Maughan (2008)
Motivation and coordination of vendor cooperation	Interdependencies between outsourced tasks require vendor cooperation and mutual support	Bapna et al. (2010)
		Nagle and Maughan (2008)
Limited transparency and accountability issues	Task interdependencies complicate the assessment of both individual vendor outputs and total outputs	Bapna et al. (2010)
		Nagle and Maughan (2008)
Incentivizing relationship-specific investments	Vendor competition decreases vendor commitment and thus the incentive for each vendor to invest in the relationship with the client	Bakos and Brynjolfsson (1993)
		Levina and Su (2008)
Difficulties in applying relational governance	Competition among vendors impedes the development of mutual trust	Babar et al. (2007)
		Bapna et al. (2010)

limited domains of vendor competence (Bhattacharya et al. 2012; Richardson and Roumasset 1995). Additional key benefits of adopting a MVO strategy include reduction in IT costs due to competition among vendors, access to a diverse set of unique vendor resources, improvement in service quality and time to market, as well as improvements in agility and innovativeness (Bapna et al. 2010; Bhattacharya et al. 2012; Lacity and Willcocks 1998; Levina and Su 2008).

Despite the potential MVO benefits, the governance of MVO initiatives also brings along numerous unique challenges (see also Table 1): First, the greater number of vendors leads to an increase in management overhead on the client side in terms of additional transaction costs (Choi and Krause 2006). This is particularly true for global sourcing of knowledge-intensive IT services, where multiple client-vendor relationships need to be managed over distance (Levina and Su 2008) and considerable relationship-specific investments by both the client and vendors are required (Heeks et al. 2001). In addition, MVO clients not only need to coordinate the relationship with each of their vendors, but also the relationships

among these vendors. This increase in coordination complexity adds extra management overhead costs (Nagle and Maughan 2008). To reduce management overhead, prior research recommends consolidating the number of vendors in later offshoring stages (Carmel and Agarwal 2002).

Second, Bapna et al. (2010) state that "the most important differentiating characteristic of a multi-sourcing environment is the interdependence between the tasks performed by multiple vendors" (p. 789). Against this backdrop, significant governance challenges arise to motivate and coordinate vendor cooperation (Nagle and Maughan 2008). That is, the client needs to make sure that vendors not only fulfill their primary tasks, but also cooperate with, coordinate activities among, and help other vendors to fulfill their primary tasks (Bapna et al. 2010).

Third, task interdependencies among vendors also exacerbate the problem of observability and verification of the quality of interrelated tasks (Bapna et al. 2010). In some cases, only individual vendor outputs, but not the total output, may be observable due to vendor-related silos of management and reporting. In other cases, the client may only observe the total output. Therefore, task interdependencies may lead to limited transparency and accountability issues (Bapna et al. 2010). For instance, in MVO contexts, it can be difficult to pinpoint which vendor is performing poorly or shirking its responsibilities because the output of a task might be dependent on the effort of other vendors (Nagle and Maughan 2008).

Fourth, in multi-sourcing contexts, high competition among vendors may undermine the commitment of each vendor to the client firm (Levina and Su 2008). Ultimately, a lack in commitment is likely to reduce the vendor's willingness to invest in the relationship with the client (Bakos and Brynjolfsson 1993).

Fifth, prior studies find that clients engaged in dyadic outsourcing relationships often heavily rely on relational governance mechanisms in order to promote trust and its underlying normative behaviors (Mani et al. 2011; Rai et al. 2009; Veltri and Saunders 2006). However, high vendor competition in multi-vendor settings may also threaten the development of mutual trust (Babar et al. 2007). Thus, clients are likely to show greater reliance on formal governance mechanisms in such settings. Here, it is even questionable whether a relational governance approach represents a feasible option at all in multi-sourcing contexts (Bapna et al. 2010). This is because creating a good relationship with one vendor may require taking actions that appear to harm the relationship with another vendor.

3 Research Methodology

3.1 Data Collection and Analysis

We chose the case study method as the most suitable one to address the needs of our research, i.e. to conduct an in-depth investigation of IT multi-sourcing in its real life context (Yin 1994). In particular, our longitudinal study was concerned

Table 2 Workshops and Interviews

	Client perspective	Vendor perspective
Number of workshops	1 full-day	–
	1 half-day	
Number of interviews	5	5
Interview duration (total)	8.5 h	6.5 h
Interview transcripts (total)	116 pages	88 pages

with developing a deeper understanding of governance challenges arising when a client firm switches from a single-vendor offshoring (SVO) to a MVO strategy. Given the dearth of research on this phenomenon, the study was exploratory and qualitative in nature and may be termed a revelatory case (ibid). Such a research approach is appropriate when studying contemporary phenomena without the need to control variables or subject behavior.

We entered the case site in summer 2012 and first conducted a series of informal meetings as well as two workshops with key client managers. These managers also provided us with additional case material such as internal documentations, steering board presentations, meeting minutes, etc. Together with the personal meetings and workshops, this material helped us to develop a better understanding of the case study context as well as to sharpen the focus of our research. Based on the insights gained in this preparatory stage, we developed semi-structured interview guidelines. Between November 2012 and April 2013, we then conducted a total of ten interviews according to Myers and Newman's (2007) guidelines for qualitative interviewing. Half of these interviews covered the client perspective, the other half the vendor perspective. This mix enabled a more comprehensive view on the phenomenon and led to more robust results.

All informants held key positions in their organizations: the client informants were jointly responsible for the setup and governance of the MVO strategy and had job titles such as Senior Manager of Offshore Service Center (OSC) Operations and Senior Manager of Corporate Procurement; the vendor informants were responsible for managing the relationship with the client organization and had job titles such as account manager and team lead (see Table 2).

The interviews lasted between one hour and two and a half hours. All interviews were conducted in person, usually by two researchers. One researcher guided the interviewee through the questionnaire, while the other researcher listened, made interview notes, and asked for clarification as required. In addition to the interview notes, all interviews were tape-recorded and transcribed immediately after each interview. In some cases, follow-up phone calls and e-mail correspondence took place to clarify issues emerging during the transcription of the interviews.

The interview transcripts amounted to a total of 204 pages (108,562 words) of case data, and were subjected to content analysis following the coding approach described by Glaser (1978, 1992). The coding process was designed to examine pre-identified MVO challenges from a positive view, as well as to identify

additional challenges in an interpretive manner (cf. Kirsch 2004). Emerging codes and categories were compared with previous research in an iterative manner. As further data collection did not reveal any new insights but rather reinforced the properties of already identified categories, these categories were considered to be theoretically saturated.

3.2 Case Context

The case site is a global corporation in the footwear and apparel industry (called *GlobalCorp* in the following). GlobalCorp has its headquarters in Germany and operates a network of almost 200 subsidiaries worldwide. Over the years, GlobalCorp's business model has shifted dramatically from being a pure wholesaler to engaging in direct interaction with end consumers by opening its own retail stores and e-commerce platforms. With this shift, also the demands for more flexible and innovative IT solutions increased significantly. Consequently, GlobalCorp now regards IT not only as an instrument for driving operational efficiency, but also as an important contributor for competitive differentiation and value creation.

GlobalCorp's IT department (about 1,000 employees) is headquartered in Germany, too. It is responsible for delivering IT services to the business departments and has a long history of IT offshoring activities, which are best described in four major phases:

Phase 1: Bringing offshore resources onsite (1997–2003)

Between 1997 and 2001, GlobalCorp implemented its first IT projects with an Indian tier-1 vendor (called *India1*) using a pure onsite approach. This move was primarily motivated by significant cost saving potentials in terms of per diem rates and the greater flexibility of the Indian vendor to ramp-up and ramp-down resources as compared to local freelancer agencies and consulting firms. In addition, GlobalCorp did not directly pay for daily allowance for the Indian onsite resources, and it only paid for one round trip to India per person in an extended time period.

Phase 2: Leveraging offshore resources (2003–2008)

In 2003, GlobalCorp's top management asked India1 to at least partly offshore its onsite resources involved in an ongoing product lifecycle management project, leading to a dual sourcing approach (i.e., the simultaneous use of onsite and offshore resources). The decision to increase the onsite-offshore ratio was again driven by financial motivations. Compared to the onsite resources, this decision enabled GlobalCorp to cut per diem rates by another 50 percent. It also benefitted India1 by decreasing its asset specificity.

The introduction of the dual sourcing approach brought up the question of how to effectively control the distant offshore resources, which were basically a "black

box". For example, when quality problems arose, it was very difficult for GlobalCorp to figure out what it could do to tackle these problems. The initial idea to involve intermediaries/agencies as "offshore bridge" was discarded for cost reasons. At this point in time, GlobalCorp also discarded the idea to build up its own captive center relatively early since too much effort (for hiring of Indian staff, renting of office buildings in India, etc.) had been needed to establish such a center.

Phase 3: Setting up an offshore service center (2008–2012)

Around 2007, GlobalCorp decided to set up an offshore service center (OSC) together with its Indian offshore partner. This decision was primarily driven by the expected future growth of GlobalCorp's offshore activities and the related need to create additional synergies, improve transparency, and facilitate vendor governance. By consolidating different offshore teams basically in "one room", it was relatively easy for the client to figure out which vendor employees still had free capacity, as well as to shift these employees to another project for support purposes. In addition, the introduction of the OSC enabled GlobalCorp to leverage its offshoring strategy. For example, whenever there was a new request for proposals (RfP), the OSC client manager had to get involved.

To start with, GlobalCorp looked for a suitable IT function that could be shifted to the OSC, and selected Enterprise Application Integration (EAI). Key reasons for selecting EAI were the adequate business volume of this function and the good match with the capabilities of its partner firm, which is certified with CMMI level 5. In 2008, GlobalCorp started to ramp-up the OSC together with India1 in Hyderabad. The OSC was setup as a profit center. On top of the already highly competitive per diem rates, GlobalCorp also defined discount thresholds for new business in the contract. Once per year, India1 had to pay out the corresponding discount, thereby generating "hard" cash for the client.

Phase 4: Switching to a multi-vendor strategy (since 2012)

After working with only one offshore vendor for more than a decade, GlobalCorp got the impression that they were locked in with this single vendor and that this vendor was feeling too comfortable:

> …the vendor was also becoming very complacent. So, they were getting very comfortable and they were not really going the extra miles. They were doing minimum things they were required to do because they were not really competing for their business—they automatically got everything. […] for example, we wanted to increase the quality of services and projects but at the same time reduce cost and we didn't have any leverage at all. So, when we went to the vendor […], they simply refused to negotiate with us on cost. (GlobalCorp manager #1)

GlobalCorp therefore decided to switch to an MVO strategy in order to increase competition among vendors and to "wake up" the main vendor, thereby enabling GlobalCorp to achieve its aggressive goals for the future. In particular, the adoption of a MVO strategy was targeted at getting increased attention from vendor top management, driving innovation, ensuring that GlobalCorp continues

to receive competitive pricing, and improving cost transparency. The switch to a MVO strategy was also supported by the recent entrance of a new CIO. This CIO had worked for considerable time in automotive industry, where multi-sourcing is already a well-established practice.

The initial plan was to select only one additional offshore vendor. However, GlobalCorp felt that, by selecting two vendors, it would be able to put more pressure on India1 with regard to both project-related business and "keep systems running" business. Consequently, GlobalCorp selected two additional offshore vendors (called *Belarus* and *India2*). While Belarus (CMMI level 4) was rated particularly highly in terms of innovation (project-related business), India2 (CMMI level 5) was rated very competitive in terms of pricing (keep-systems-running business). From this point, whenever a new RfP came up, all three offshore vendors were automatically included in the RfP process.

One year after the introduction of its MVO strategy, GlobalCorp already considered its change in offshore sourcing strategy a "success story". In particular, GlobalCorp increased its flexibility by getting less dependent on India1, improving vendor responsiveness, and getting back top management attention from its former single vendor. For instance, as a first reaction to GlobalCorp' MVO strategy, this vendor increased the number of key accounts from two to six managers. In addition, the inclusion of India2 and Belarus resulted in significant cost savings and seemed to have triggered innovative input by the vendors.

4 Case Findings

In our case study, we identified four major sources of MVO challenges: sourcing history (with single vendor), number of vendors, vendor competition, and task interdependencies among vendors.

In the following subsections, we will discuss the MVO challenges arising from these four sources. While we choose to concentrate on these sources and challenges separately to highlight the issues, we recognize that they are all interrelated (see Fig. 2).

4.1 Source 1: Sourcing History (with Single Vendor)

A specific feature of the MVO setup in our case study is that GlobalCorp has already worked with one of its vendors (India1) for more than a decade. This long-term relationship with a single vendor created unique challenges for GlobalCorp's top management, in particular, with regard to establishing an internal MVO culture and understanding as well as an internal acceptance for the two new offshore vendors (India2 and Belarus).

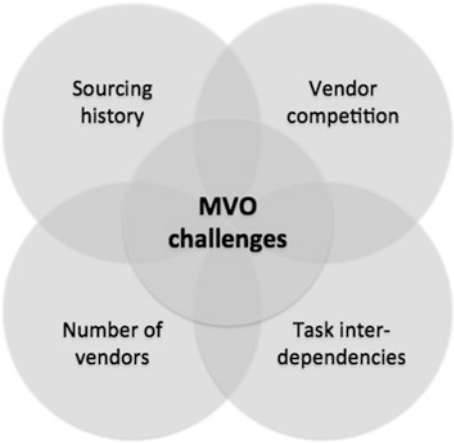


Fig. 2 Sources of MVO challenges

4.1.1 Establishing a MVO Culture and Understanding

Project managers at GlobalCorp especially seem to view an offshore vendor not only as an outsourcing partner but also as a human resource pool. This view can be traced back to the long-term relationship with India1, where vendor staff often worked for an extended time period at the client site. Here, whenever managers lacked onsite personnel for a project, they simply asked the vendor to provide the required resources. Similarly, a key driver of the establishment of the offshore service center (OSC) was the increased ability to freely shift vendor resources from one project to another. This "resource-based" approach to IS offshoring is still deeply anchored in people's minds, and also observable in the new MVO setup as highlighted by a manager from each of the two new vendors:

> While the top management understands the multi-vendor strategy and how it should be leveraged to get benefits, the middle management or, let's say, the junior management does not understand the real multi-vendor strategy and setup. So, what they feel is that multi-vendor strategy […] is always about having two vendors in the same project. That is a first myth we are trying to debunk. (India2 manager)
>
> …at the beginning we were kind of a black horse for GlobalCorp […] I think we are the [only] vendor that has less than 10 percent onsite […] And this was a bit of challenge in the beginning because GlobalCorp was insisting on bringing people onsite. (Belarus manager)

As is evident from these quotes, both new vendors sense problems in how MVO was initially implemented. This created what they understood to be misperceptions at the operational level about their company's role.

On a related note, client (project) managers seem to view the MVO strategy primarily as an opportunity to cut costs. However, this is at least partly in contrast to GlobalCorp's top management intention to also increase service quality and

improve innovativeness by sourcing from multiple vendors. Consequently, vendors also had to deal with a second set of misperceptions at the operational level:

> [Another] myth that people have [is that a] multi-vendor strategy is all about cost-cutting. It is not. A multi-vendor strategy is all about ensuring the highest quality deliverables, bringing in more innovation, reducing risks of a project, bringing in expertise [at] a fair price—at a price you will be comfortable paying. (India2 manager)

In addition, GlobalCorp's middle management sometimes seems to feel uncomfortable with having more than one vendor within a functional area. They then urge project or service managers to work with a particular vendor in this area, thereby potentially diminishing the benefits a MVO strategy has to offer, such as spreading risks across multiple vendors and leveraging their competencies:

> [Multi-vendor management] is as well the freedom […] to choose between different vendors. But if […] I have to work with vendor A then I just can, let's say, design and manage the relationship within that one vendor. (GlobalCorp manager #2)
>
> But I come as well to certain limits because either my boss says 'No, I don't think it's a good idea if we have more than one vendor in [keep systems running]. I don't like that'. Or, 'You cannot do an RfP next year because the risk for me is far too high because now I have [India1] as well in another area and I want to have stability, stability in that whole area'. (GlobalCorp manager #2)

The illustrative quotes above highlight that GlobalCorp's top management still needs to invest considerable efforts in promoting an internal MVO mindset, and in particular in instructing middle and project management about how to make and implement vendor decisions within the strategic MVO framework.

4.1.2 Encouraging Internal Acceptance of New Vendors

Another main challenge that we have not seen discussed to date in the literature is the resistance that the client's middle and lower management display towards working with the two new offshore vendors. As a result of the long-term relationship with India1, GlobalCorp's top management still struggles to get internal acceptance for the new vendors on lower management levels. This struggle is recognized by the vendors:

> The question is on which level the [sourcing] decision is taken, right? Because it might be that the CIO, for instance, wants to have this vendor here. But people on some levels below, who really do the work and are responsible day-to-day for it, they have some different opinion. They don't want to take the risk or it's just more convenient for them. (Belarus manager)

As in any other company, managers at GlobalCorp are judged on their bottom line, and are made responsible if something goes wrong in their area of responsibility. So, after years of interaction with India1 and its employees, client managers often have a close working relationship with the old vendor, as well as a favorable or at least realistic assessment of this vendor's capabilities. Thus,

managers are hesitant to take the risk of onboarding new vendors who may not deliver as promised in the end.

> I think it's just a natural human tendency, so, if I'm a manager working with vendor A and I've been working with them for ten years it's a natural tendency to keep working with them because I don't want to change. (GlobalCorp manager #1)
>
> There are many people within GlobalCorp who are used to working with a vendor, one vendor, let's say, from the last ten years. So, they are very resistant to change. Even though they see a better proposition in an RfP from a separate vendor, the myth that they have is that a known devil is better than the unknown. So, they would rather stick with the current vendor who is giving the same price… (India2 manager)

In general, the client's internal resistance may vary depending on the extent to which competencies are substitutable across vendors. Here, one can assume that, in MVO settings where each vendor possesses a relatively unique set of (non-substitutable) competencies, client managers may be quite willing to hire them for projects requiring those competencies. In contrast, if the new and old vendors have similar skills, why not stay with the "devil" you already know? This is exactly one of the problems in the situation at GlobalCorp where all three vendors have the same basic skill set. Furthermore, at GlobalCorp, some client managers seem to be unaware of the competencies of the new vendors:

> Sometimes people don't know really that [Belarus] and [India2] can do something for them, and they go to [India1] directly. (Belarus manager)

A related problem in GlobalCorp's current MVO setup is that Belarus and India2 need to go through a learning curve to understand the client's business before really being in a position to compete with India1. However, none of the client managers is really willing to be the one who accompanies the new vendors through this learning curve. This was explained by one of GlobalCorp's senior managers:

> …what was happening was [that] a lot of people were reluctant and said: 'OK, not me, not now. Let me first wait for my colleague to experience how good they are.' (GlobalCorp manager #1)

To break the client's internal resistance in working with the new vendors, managers from both Belarus and India2 believe that intervention by GlobalCorp's CIO is needed:

> [GlobalCorp] is probably stuck in a situation where the CIO has to really force people and say that 'Hey, you have to give this project to this guy. I know it's a bid, I know it's a formal RfP, but you can chose only between these two vendors, you can't go beyond these two vendors.' (India2 manager)
>
> …what [GlobalCorp] has to do, from my opinion, is [to] bring this message that you should not stay in this conservative comfort level that you have now with your old vendor and [that] you should try new vendors and see maybe you can get something better. (Belarus manager)

However, one of the vendor managers also cautions that, if the client's CIO tries to force internal acceptance, this may lead to a vicious cycle:

> [If the CIO] sends an e-mail [to the responsible manager], the manager is compelled to do it but does the manager like me at the end of the day? No. Will we have a very good relationship working on that project? Might not be. Will I get another project from him? Surely not. So, it is the hard way because it gives me short-term returns. But in the longer term it might not work out. (India2 manager)

4.2 Source 2: Number of Vendors

In line with prior MVO literature (e.g., Carmel and Agarwal 2002; Levina and Su 2008), we found that GlobalCorp's strategic decision to involve multiple offshore vendors created the internal challenge of how to cope with the considerable increase in management overhead. In this context, we also identified the increase in cultural diversity as another MVO challenge, which has so far not been articulated in earlier literature.

4.2.1 Coping with Increased Management Overhead

Before the introduction of the MVO strategy, GlobalCorp's governance approach can be best described as "people-based" with only very basic IT support. As a consequence, the inclusion of two additional offshore vendors basically tripled the internal administrative overhead:

> …one should not overestimate the cost advantage because you also have to deal with the overhead of our offshoring vendors (GlobalCorp manager #4)

Communication could be anticipated to increase substantially as each new vendor is added to the mix.[1] This was the case at GlobalCorp as additional communication channels were put in place among the vendors.

> …when we identify something we have to communicate it three times now. And maybe we have to go into three task forces. (GlobalCorp manager #3)

In addition, due to the lack in IT support, GlobalCorp was also experiencing problems in dealing with the increased data volumes, and thus became highly dependent on its vendors in terms of reporting:

> …at the end of the year, we need to give [GlobalCorp] a volume discount. [But] for that calculation, they don't have data. So, they come and ask us. These are the things that you expect a mature multi-vendor governance setup would have. (India2 manager)

[1] See Brooks (1975) for a formula to calculate the number of communication channels that will be generated.

Against this background, GlobalCorp realized that better reporting systems for the vendors and internally are needed to reduce its administrative overhead as well as to reduce its dependency on the vendors. A client manager comments:

> …some of the [reporting] gaps cannot be 'healed' with our established systems at the moment. So we must think about how shall we now customize existing systems? Shall we buy new software for that, what can we do? Shall we just do it on a very, very low level of administration with Excel? Whatever, I mean that is a critical topic. Definitely, we know what we should improve, but we also know that we might not have the capabilities to do it ad hoc. (GlobalCorp manager #3)

GlobalCorp also realized that a more formal and standardized governance approach needs to be developed, which allows client managers to treat all vendors in the same way. For instance, GlobalCorp was finding that it can not easily look across master and service level agreements with its vendors since each was at least partly couched in different terms:

> I should have a fixed framework of [contractual agreements] which would apply [to] vendor A, B and C, so that I could compare and I could use those different things [for each vendor]. This would help me as well […] to change between those vendors. (GlobalCorp manager #2)

To increase the maturity of its formal governance framework, GlobalCorp is investing considerable effort into making contractual agreements with the three vendors more comparable. These efforts primarily are aimed at facilitating coordination, decision-making, and transitions among vendors.

4.2.2 Handling Increased Multi-level Cultural Diversity

Another, albeit less mentioned challenge GlobalCorp faced in executing its new MVO strategy is dealing with multiple national and organizational cultures. While this challenge also exists in SVO arrangements, it is clearly exacerbated in MVO environments as emphasized in the quote of a GlobalCorp manager:

> …it's the increase in [overall] complexity but as well the increase in complexity with regard to managing different cultures. […] I'm 'fighting' with the guy from [Belarus] and then the next day I have got the discussion with my Indian colleagues (GlobalCorp manager #2)

Multi-level cultural differences are more pronounced in multi- than in single-vendor sourcing. Within the complex socio-technical MVO context, culture may range from national, regional, organizational or professional (functional) to the team level (Huang and Trauth 2007). For example, at the national level, power distance and uncertainty avoidance are likely to be higher in Belarus than in India. Other differences in the norms and processing are likely to surface as the three vendors interact with GlobalCorp and among themselves. Thus, cultural diversity is expected to increase as the number of vendors and nations they represent increases.

The increase in cultural diversity not only requires client managers to constantly adapt to people from very different cultures in daily interactions, but may also lead to significant differences in status reporting. For instance, while Indian vendors are unlikely to indicate that work is falling behind, the Belarus vendor is more likely to view its work progress as worse than it actually is. This is in line with related studies, which show that culture affects the vendor's willingness to report bad news in IS projects (Keil et al. 2007; Tan et al. 2003). Ultimately, such culture-related differences in project status reporting between the Belarus and Indian vendors make it harder to manage and coordinate vendor activities.

4.3 Source 3: Vendor Competition

GlobalCorp switched to a MVO strategy to keep the former single vendor, India1, on its toes. That is, the two other offshore vendors were introduced to create a more competitive environment. The latter, however, also created new challenges, namely, the challenge of how to shape and retain fair competition among the vendors, as well as to incentivize all three vendors to invest in the relationship with the client.

4.3.1 Shaping and Retaining Fair Competition

One of the greatest challenges for GlobalCorp in managing the relationships with its multiple vendors is creating fair competition among them. A key reason for this was that India1 had a history with GlobalCorp, which allowed this vendor to leverage its long-term relationship:

> So, we have really intimate information about GlobalCorp because of our relationship. And I think we know their problems also better then competition and that's what our focus is as well. (India1 manager)

Managers from both Belarus and India2 are acutely aware of this strategy on the part of the "old" vendor and note:

> …one of the challenges, of course, [is that] we compete with the vendor which is playing here for years, yeah? And we can feel it, yeah? For us it's not easy, at the moment. We try to do it but still we see the lack of experience in some areas. But we try to speed up and if not this year, then next year we will be able to compete on the same level. (Belarus manager)
>
> …the environment they have now is a bit problematic for new vendors to compete with [India1] in this space, because they have a long history working with [GlobalCorp] and of course they have a lot of experience already gained through these years. (Belarus manager)
>
> …the governance mechanisms have to ensure that none of the vendors takes advantage of [GlobalCorp] by leveraging the weakness of the other vendors… (India2 manager)

The problem of fair competition was further exacerbated by GlobalCorp's decision to partly staff projects with personnel from multiple vendors:

> So, we have situations where we have more than one vendor team working on the same project and there sometimes we hear noise. It's only noise when one vendor is complaining about the other vendor, saying this vendor is not playing in a fair way and things like that. (GlobalCorp manager #1)

Consequently, to make sure that all vendors involved in a single project play fairly, GlobalCorp usually assigns a client manager to such projects. This manager then serves as a coordinating and governing agency and tries to ensure that none of the vendors leverages the weakness of the other vendor(s) to GlobalCorp's detriment.

While shaping fair competition represents a key challenge in GlobalCorp's current MVO setup, especially in the long run, another key challenge for the client will be to also keep vendor competition alive. Vendors may find their niche in GlobalCorp's IT project and service portfolio, and view each other as collaborators rather than competitors, thereby undermining one of the basic assumptions underlying GlobalCorp's MVO strategy:

> The key challenge is in the end to really keep competition alive. To find out if and to monitor also if the three vendors […] still have that eagerness or find a way to arrange each other. And that's always something we have to be careful [about] (GlobalCorp manager #3)
>
> …the biggest challenge for us […] is to keep them satisfied and engaged. Obviously the vendors are in the business for making money and they want to get a nice piece of the cake. […] So, we, as [GlobalCorp], in order to have true competition and […] a level playing field, we need to feed them the right amount of business and that is the biggest challenge. Because let me have one big player and they can really afford to squash the competition. (GlobalCorp manager #1)

Thus, GlobalCorp is learning that shaping and retaining fair competition is a delicate balancing act among its three vendors. On one hand, the negative impacts of competition in MVO projects must be held at bay. On the other hand, the competition must be kept alive to encourage innovation and favorable pricing.

4.3.2 Incentivizing Vendors to Invest in the Relationship

Partly related to the challenge of ensuring fair competition among vendors, simultaneously incentivizing multiple vendors to perform is also challenging. In SVO settings, clients can establish their expectations and compensate the vendor when it is able to successfully meet those expectations. In contrast, in MVO environments, the client needs to keep competitors motivated and contented at the same time. A vendor manager uses the analogy of a king who has several wives to illustrate this challenge:

> …how do you ensure that you keep everybody happy without everybody thinking that they are doing the same thing with everybody else. So, the trick is to ensure that the king makes

me feel that I am the most special one for [GlobalCorp] and he does that with my neighbor as well, and my neighbor as well. (India2 manager)

The central objective of this "favored bride" approach is to make sure that each vendor has enough benefits from its work to also justify its investments in the relationship with the client firm as well as its "raison d'être" within the client's MVO strategy.

…it's about how do you make [India2] invest in the relationship. So, the governance aspect has to ensure that all the parties in the multi-vendor situation are interested in continuing the relationship. (India2 manager)

…if [small vendors] don't win the first three bids, they also will be questioning themselves […], are we here just to keep the price competitive […] or is there really growth here? (India1 manager)

…for example, I can still remember [Belarus] for the longest time, for nearly four months, they did not have any project in [GlobalCorp]. So, we added them as a vendor but they did not get really anything. So, they were very upset that they partner with us and they were not getting anything. (GlobalCorp manager #1)

In this context, it seems to be particularly important to assign a critical mass in business volume to each of the multiple vendors:

…in a multi-vendor setup unless you give each vendor a critical mass you'll never see the full benefits. (India2 manager)

To make vendors feel "special", GlobalCorp adopted strategies for managing vendor expectations, reminding them about future efforts to balance the load, and providing an environment for growth.

People need to trust that you have a certain interest in them and it's by setting the right expectations. So, when we introduced the new vendors […], we concretely, physically promised them areas, we at least gave them an outlook what they could expect. And then during the road we constantly again in this informal level try to coach them, try to keep close to them, try to sometimes manage the frustrations if there were frustrations about losing a certain deal. (GlobalCorp manager #4)

…one of the very strong things that we did was also have clear targets for the [senior management team] through our CIO to say 'OK, you will have at least in one of the areas in your portfolio a second vendor'. (GlobalCorp manager #1)

Below, a quote by a vendor manager to illustrate reactions to GlobalCorp's attempts to keep vendors motivated in investing in the relationship:

…if I lose one deal in a big RfP and I think I have done a good job I feel demotivated. I'll go and complain to the sourcing governance team: 'Hey, I have put so much energy and I thought I put the best offer on the table but I still lost. I don't think I want to continue any more with [GlobalCorp].' There are, there have been days with the fact that they need to listen and say: 'Hey, don't worry, there is a good one lined up in the next quarter, I think you will get it.' So, those kind of things are really important. (India2 manager)

4.4 Source 4: Task Interdependencies

One main benefit GlobalCorp was expecting to achieve from switching to a MVO strategy was increasing its flexibility in terms of decision-making and getting access to a broader skill set. However, the introduction of two additional offshore vendors also generated new interdependencies within the client's project portfolio, thereby hampering the desired sourcing flexibility. As noted by Bapna et al. (2010), interdependencies among the tasks performed by multiple vendors are the most important distinguishing factor of MVO environments.

The challenges created by task interdependencies emerge from coordinating actions and assigning accountability. This supports the argument of Hui et al. (2008) that distributing tasks among vendors exacerbates coordination and control problems.

4.4.1 Motivating and Coordinating Vendor Cooperation

One key challenge of task interdependencies is to coordinate the activities of the various vendors. This can be daunting, especially as the projects become more complex and the tasks more interdependent. With just one vendor, the vendor can complete its development activities on its own, reflecting pooled interdependence (Thompson 1967). However with the multiple vendors, GlobalCorp is finding that the products of one vendor become the input for another creating sequential interdependence, over even reciprocal interdependence. The increasing levels of interdependence can be expected to require more coordination through such methods as planning, scheduling and greater information exchange. The sequential interdependence is exemplified with the quote below:

> We had several projects where […] we were dependent on other vendors […], and our result was heavily dependent on what they should do. (Belarus manager)

In addition, there were also projects where team members came from multiple vendors. In such projects, GlobalCorp served as coordinating agency:

> …we have numerous teams where we have a couple of people from [India1] and a couple of people from [Belarus], for example. And there is no contractual aspect to say [Belarus] reports to [India1], or vice versa. So, they are all reporting to the [GlobalCorp] manager, and it's the [GlobalCorp] manager who is responsible to […] get whatever [we] need to get out of these two vendor resources. (GlobalCorp manager #1)

GlobalCorp's decision to serve as coordinating agency also facilitated the motivation of vendors to cooperate with each other, which is mentioned as another key MVO challenge in prior literature (Bapna et al. 2010):

> …we do whatever it takes to make the customer happy with what we have to do, to deliver. And if it means we need to help our competitor to do something, we do it. (Belarus manager)

4.4.2 Dealing with Accountability Issues

In GlobalCorp's competitive MVO environment, task interdependencies arise, making it difficult to assign overall accountability for a project. Here, GlobalCorp's "resource-based" MVO approach in combination with its decision to act as coordinating agency even aggravated accountability issues. The following quote indicates what happens to accountability when personnel from multiple vendors are involved in a single project: It falls to GlobalCorp.

> Today what ends up happening is that a project manager in [GlobalCorp] as soon as he wants to do a project he'll call up [all three vendors] and he would say 'Can you, please, give me two people?'. […] So, there are projects where we have seen all the three companies working in the same project. And that results in accountability issues. So, who takes the responsibility if the project goes wrong? Who takes the responsibility of ensuring responsibility that the timelines are met? Who takes the responsibility of mitigating risks in a project? So, the answer is—GlobalCorp. Because I have put two people but why will I manage the other eight people in the project? It's not my business. (India2 manager)

To deal with accountability issues, client managers are paying particular attention to more clearly determining who is responsible for completing which activities, as evidenced by this quote.

> …you always try to allocate a clear defined responsibility to one vendor to avoid that you get discussions about the outcome. (GlobalCorp manager #4)

Apart from assigning clear vendor responsibilities, GlobalCorp also does not always seem to be employing its original (resource-based) approach to MVO. Instead of serving as coordinating agency and taking over accountability for projects, GlobalCorp now started to shift project accountability to a single vendor:

> Normally, GlobalCorp used to work in a way that they are responsible completely for their projects. Nowadays they want to change it a bit and kind of outsource the project itself to a vendor. So, if this will happen then the vendor will take the complete responsibility as well. Up until now, in most of the cases, GlobalCorp was responsible itself for the project outcome. (Belarus manager)

While this approach is likely to decrease accountability issues, it may have a negative impact on vendors' willingness to cooperate with other vendors (see above). In other words, the vendor which is accountable for a project may be less willing to accept the risk of working with other vendors on this project, and vice versa.

5 Discussion and Conclusions

In our case study, we identified eight key challenges that emerged as a result of GlobalCorp's switch from a single- to a multi-sourcing strategy. These challenges can be classified along two major dimensions: the primarily concerned management *level* (top vs. operational level) and management *area* (internal accommodations vs.

Table 3 MVO challenges by management level and area

Area level	Internal accommodations	Vendor relationships
Top management	Source 1: Sourcing history	Source 3: Vendor competition
	• Establishing a MVO culture and understanding*	• Shaping and retaining fair competition*
	• Encouraging internal acceptance of new vendors*	• Incentivizing vendors to invest in the relationship
Operational management	Source 2: Number of vendors	Source 4: Task interdependencies
	• Coping with increased management overhead	• Motivating and coordinating vendor cooperation
	• Handling increased multi-level cultural diversity*	• Dealing with accountability issues

Note *Not discussed in prior literature (compare Table 1 in Sect. 2.2)

vendor relationships). Each quadrant of the resulting 2 × 2 matrix reflects one of the four identified key sources of MVO challenges (see Table 3).

While some of the identified MVO challenges have already been discussed in prior literature, we also found several "new" challenges (marked with an asterisk in Table 3 above). At least partly, this may be attributed to our study's focus on the switch from a SVO to a MVO strategy. For instance, given its long history of single-sourcing and, in particular, its close relationship with one of the MVO vendors (India1), GlobalCorp's top management experienced significant challenges in establishing a MVO mindset and getting acceptance for the two recently added offshore vendors (Belarus and India2) within the client organization.

However, we also identified other novel challenges, which seem to emerge in MVO settings regardless of the client's sourcing history. For example, as soon as multiple vendors are involved, client managers need to deal with an increased diversity in terms of (national and organizational) cultures. This cultural multiplicity not only demands greater flexibility by client managers in their social interactions with vendor representatives, but also greater awareness in terms of managing culturally diverse vendors. Among others, cultural differences between vendors may lead to significant differences in reporting behaviors, including blame-shifting (Keil et al. 2007) and optimistic or pessimistic biasing (Iacovou et al. 2009; Snow et al. 2007). It also may lead to measures to enhance standardization.

Moreover, our case findings seem to debunk the myth that relational governance may not be applicable in MVO settings (Bapna et al. 2010). Rather, our study suggests that it is a question of how to combine formal and relational governance. More specifically, what we see from our case study is that the client company uses a dual governance approach to manage the relationships with its offshore vendors. This governance approach is best described as a "good cop—bad cop" approach. The "good cop" role is performed by a group of senior managers who work closely together with the three vendors, thereby heavily relying on

relational governance mechanisms to steer and advise the vendors as well as to solve emerging problems. The "bad cop" role is performed by one of the departments responsible for IT services procurement. This department's governance approach is much more formal and thus contract- and compliance-driven. In addition, as a third governance body, the client has established a steering board committee on the top management level with each vendor. The steering board committees bring together the client managers performing the good cop and bad cop roles, respectively, and thus ensure the alignment of the applied dual governance approach. This finding seems to refine prior results on the governance of client-vendor relationships, which suggests that formal and relational governance mechanisms complement each other in such relationships (e.g., Poppo and Zenger 2002). Specifically, our case study indicates that the complementarity of formal and relational governance occurs through the combination of formal and relational governance approaches on different managerial levels.

Finally, our study recognizes three MVO models: "pure", guardian vendor (Bapna et al. 2010) and "bridged" (Holmström Olsson et al. 2008). GlobalCorp adopted a pure MVO model to create competition among offshore vendors. In this model the client firm directly interacts with all of its multiple vendors and is also responsible for coordinating the activities of these vendors. Because of the focus on competition among vendors, we were able to observe a number of challenges that were not described in earlier studies involving guardian vendor or bridged MVO models.

The findings of our study should be interpreted with three major limitations in mind. First, as mentioned above, our study focused on a MVO context where one of the multiple vendors used to be the preferred, single offshore vendor before the introduction of the client's multi-sourcing strategy. Second, GlobalCorp is in the early stages of MVO, and thus still in the process of identifying appropriate management tactics and assessing the effectiveness of such tactics for addressing the experienced challenges. Third, we focused on only one MVO model. An interesting avenue for future research might be to study the factors that influence the client's selection of different MVO models.

Consistent with earlier calls for more research on the vendor role in outsourcing relationships (Lee 2008; Levina and Ross 2003), another promising direction for future research would be to study MVO arrangements from a vendor perspective. For instance, while prior studies identify a myriad of client benefits (e.g., Bapna et al. 2010; Cohen and Young 2006; Levina and Su 2008), we are not aware of any study that has looked at potential vendor benefits. Interestingly, our case study indicates that all three vendors realized expanded revenues from their GlobalCorp accounts. Even the former single vendor (India1) learned from the other two preferred vendors when GlobalCorp switched to a MVO strategy. This observation is in line with Bapna et al. (2010) who argue that "a significant amount of learning in multisourcing is expected to occur between vendors" (p. 794). They therefore suggest the development of a learning taxonomy as well as the identification of formal and informal mechanisms that facilitate vendor learning as fruitful paths for future research.

In conclusion, our study contributes to prior literature by providing a framework of key MVO challenges and the sources of such challenges. We hope that our framework provides a useful foundation for studying the governance of multi-sourcing arrangements and inspires future work on this increasingly important phenomenon.

References

Babar, M. A., Verner, J. M., & Nguyen, P. T. (2007). Establishing and maintaining trust in software outsourcing relationships: An empirical investigation. *Journal of Systems and Software, 80*(9), 1438–1449.

Bakos, Y., & Brynjolfsson, E. (1993). From vendors to partners: Information technology and incomplete contracts in buyer-supplier relationships. *Journal of Organizational Computing, 3*(3), 301–328.

Bapna, R., Barua, A., Mani, D., & Mehra, A. (2010). Cooperation, coordination, and governance in multisourcing: An agenda for analytical and empirical research. *Information Systems Research, 21*(4), 785–795.

Bhattacharya, S., Gupta, A., & Hasija, S. (2012). *Single sourcing versus multisourcing: The role of effort interdependence, metric-outcome misalignment, and incentive design*. INSEAD Faculty and Research Working Paper.

Brooks, F. P. (1975). *The mythical man-month*. Reading: Addison-Wesley.

Carmel, E., & Agarwal, R. (2002). The maturation of offshore sourcing of information technology work. *MIS Quarterly Executive, 1*(2), 65–78.

Carmel, E., & Tjia, P. (2005). *Offshoring information technology*. Cambridge: Cambridge University Press.

Choi, T. Y., & Krause, D. R. (2006). The supply base and its complexity: Implications for transaction costs, risks, responsiveness, and innovation. *Journal of Operations Management, 24*(5), 637–652.

Choudhury, V., & Sabherwal, R. (2003). Portfolios of control in outsourced software development projects. *Information Systems Research, 14*(3), 291–314.

Cohen, L., & Young, A. (2006). *Multisourcing: moving beyond outsourcing to achieve growth and agility*. Boston: Harvard Business School Press.

Deloitte (2006). Get the big picture: Outsourcing IT infrastructure, and finding your 'guardian vendor'. In Deloitte CIO Club, *Winter 2005/2006*. London, UK: Deloitte & Touche LLP.

Dibbern, J., Winkler, J., & Heinzl, A. (2008). Explaining variations in client extra costs between software projects offshored to India. *MIS Quarterly, 32*(2), 333–366.

Glaser, B. G. (1978). *Theoretical sensitivity: advances in the methodology of grounded theory*. Mill Valley, CA: Sociology Press.

Glaser, B. G. (1992). *Emergence versus forcing: basics of grounded theory analysis*. Mill Valley, CA: Sociology Press.

Goo, J., Kishore, R., Rao, H. R., & Nam, K. (2009). The role of service level agreements in relational management of information technology outsourcing: An empirical study. *MIS Quarterly, 33*(1), 119–145.

Heeks, R., Krishna, S., Nicholson, B., & Sahay, S. (2001). Synching or sinking: Global software outsourcing relationships. *IEEE Software, 18*(2), 54–60.

Holmström Olsson, H., O Conchuir, E., Ågerfalk, P. J., & Fitzgerald, B. (2008). Two-stage offshoring: An investigation of the Irish bridge. *MIS Quarterly*, *32*(2), 257–279.

Hui, P. P., Fonstad, N. O., & Beath, C. M. (2008). Technology service inter-organizational relationships: An agenda for information technology service sourcing research. In S. Cropper, C. Huxham, M. Ebers, & P. S. Ring (Eds.), *The oxford handbook of inter-organizational relations*. Oxford: Oxford University Press.

Huang, H., & Trauth, E. M. (2007). Cultural influences and globally distributed information systems development: experiences from Chinese IT professionals. In *Proceedings of the ACM SIGMIS CPR Conference on Computer Personnel Research: The Global Information Technology Workforce* (pp. 36–45). New York.

Iacovou, C. L., Thompson, R. L., & Smith, H. J. (2009). Selective status reporting in information systems projects: A dyadic-level investigation. *MIS Quarterly, 33*(4), 785–810.

Keil, M., Im, G. P., & Mähring, M. (2007). Reporting bad news on software projects: The effects of culturally constituted views of face-saving. *Information Systems Journal, 17*(1), 59–87.

Kirsch, L. J. (2004). Deploying common systems globally: The dynamics of control. *Information Systems Research, 15*(4), 374–395.

Lacity, M. C., & Willcocks, L. P. (1998). An empirical investigation of information technology sourcing practices: Lessons from experience. *MIS Quarterly, 22*(3), 363–408.

Lee, J.-N. (2008). Exploring the vendor's process model in information technology outsourcing. *Communications of the Association for Information Systems, 22*, 569–588.

Levina, N., & Ross, J. W. (2003). From the vendor's perspective: Exploring the value proposition in information technology outsourcing. *MIS Quarterly, 27*(3), 331–364.

Levina, N., & Su, N. (2008). Global multisourcing strategy: The emergence of a supplier portfolio in services offshoring. *Decision Sciences, 39*(3), 541–570.

Mahnke, V., Wareham, J., & Bjorn-Andersen, N. (2008). Offshore middlemen: Transnational intermediation in technology sourcing. *Journal of Information Technology, 23*(1), 18–30.

Mani, D., Barua, A., & Whinston, A. B. (2011). An empirical analysis of the contractual and information structures of business process outsourcing relationships. *Information Systems Research, 23*(3), 618–634.

Myers, M. D., & Newman, M. (2007). The qualitative interview in IS research: Examining the craft. *Information and Organization, 17*(1), 2–26.

Nagle, A., & Maughan, A. (2008). Single and multi-sourcing models. In Practical Law Company (PLC), *Cross-border outsourcing handbook 2007/2008*. www.practicallaw.com/8-380-6567.

Poppo, L., & Zenger, T. (2002). Do formal contracts and relational governance function as substitutes or complements? *Strategic Management Journal, 23*(8), 707–725.

Rai, A., Maruping, L. M., & Venkatesh, V. (2009). Offshore information systems project success: The role of social embeddedness and cultural characteristics. *MIS Quarterly, 33*(3), 617–641.

Richardson, J., & Roumasset, J. (1995). Sole sourcing, competitive sourcing, parallel sourcing: Mechanisms for supplier performance. *Managerial and Decision Economics, 16*(1), 71–84.

Snow, A. P., Keil, M., & Wallace, L. (2007). The effects of optimistic and pessimistic biasing on software project status reporting. *Information and Management, 44*(2), 130–141.

Tan, B. C. Y., Smith, H. J., Keil, M., & Montealegre, R. (2003). Reporting bad news about software projects: Impact of organizational climate and information asymmetry in an individualistic and a collectivistic culture. *IEEE Transactions on Engineering Management, 50*(1), 64–77.

Thompson, J. D. (1967). *Organizations in action: social science bases of administrative theory*. New York: McGraw-Hill.

Veltri, N., & Saunders, C. S. (2006). Antecedents of information systems backsourcing. In R. Hirschheim, A. Heinzl, & J. Dibbern (Eds.), *Information systems outsourcing* (2nd ed.). Heidelberg: Springer.

Yin, R. (1994). *Case study research: design and methods* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Understanding the Role of Organizational Integration in Developing and Operating Software-as-a-Service

Sebastian Stuckenberg, Thomas Kude and Armin Heinzl

Abstract While previous research has mostly studied Software-as-a-Service from a client perspective or focused on downstream activities of vendors, an in-depth understanding of the coordination and communication between software development and software operations is still missing. In order to fill this gap, we develop a theoretical framework that integrates extant literature on the constituent characteristics of services and on organizational integration. Guided by this framework and based on a multiple-case study of six software vendors, we identify five types of challenges and opportunities of organizational integration between Software-as-a-Service development and operations. The challenges include ensuring awareness and continuity between operations and development, as well as considering customers' business activities in scheduling updates. The opportunities relate to the ability to leverage a direct feedback channel and innovate with higher velocity. In addition, service mindset, technical harmonization, and company size emerged as three contingency factors that enable or inhibit organizational integration. The study contributes to existing literature by providing a better understanding of the activities that require coordination and communication when developing and operating Software-as-a-Service. Moreover, this study adds to previous research by linking the integration of organizational subunits to constituent characteristics

This paper was originally published as: Stuckenberg, Sebastian, Kude, Thomas and Heinzl, Armin "Understanding the Role of Organizational Integration in Developing and Operating Software-as-a-Service", Journal of Business Economics, 2014. Reprint with permission of Springer Science + Business Media.

S. Stuckenberg · T. Kude (✉) · A. Heinzl
Department of General Management and Information Systems, University of Mannheim, L15, 1-6, 68161 Mannheim, Germany
e-mail: kude@uni-mannheim.de

S. Stuckenberg
e-mail: stuckenberg@uni-mannheim.de

A. Heinzl
e-mail: heinzl@uni-mannheim.de

R. Hirschheim et al. (eds.), *Information Systems Outsourcing*, Progress in IS,
DOI 10.1007/978-3-662-43820-6_13

of services. Decision makers learn about challenges and opportunities when offering Software-as-a-Service that go beyond providing a technical infrastructure.

Keywords Software-as-a-Service · Cloud computing · Service characteristics · Organizational integration · Software development · Software operation · Service mindset · Technical harmonization

1 Introduction

Software-as-a-Service describes a distribution concept that enables clients to access software applications via a cloud infrastructure (Choudhary 2007b; Ma 2007; Xin and Levina 2008). Together with Platform-as-a-Service and Infrastructure-as-a-Service, Software-as-a-Service is a subcategory of the more general Cloud Computing concept. Cloud computing has been defined as a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of computing resources (Weinhardt et al. 2009; NIST 2011). The adoption of Software-as-a-Service solutions by customers, as well as the number of software vendors offering their solutions in a service mode, has gained significant growth rates over the last years (Merz et al. 2011; West et al. 2010). Although certain aspects of the concept are not entirely new and have already surfaced in preceding approaches such as Application Software Provisioning (ASP), the recent technological and infrastructure advances have fuelled the dissemination of solutions and helped overcome the pitfalls of previous concepts (Mäkilä et al. 2010).

Most existing research on Cloud Computing and Software-as-a-Service has taken a client perspective and studied questions such as the adoption of the concepts or the inherent risks for clients (Benlian and Hess 2009; Tyrväinen and Selin 2011; Wu et al. 2011; Xin and Levina 2008). Providing software services instead of software products, however, does not only affect clients, but has important implications for software vendors as well. For instance, previous studies have mentioned implications of the Software-as-a-Service concept on the marketing and sales processes of software firms (Luoma and Rönkkö 2012; Tyrväinen and Selin 2011; Stuckenberg et al. 2011), or on the management of partnership networks (Hilkert et al. 2010; Schuetz et al. 2013; Ojala and Tyrväinen 2011).

In addition to these implications for downstream activities, the concept also affects the internal organization of software vendors, given that the responsibility for operating solutions and, thus, interacting with end-users shifts to the Software-as-a-Service vendor (see Fig. 1). From a purely technical perspective, this new function of providing the infrastructure to offer cloud services may be perceived as an additional activity that does not pose significant challenges for software firms. In particular, the human and technical resources to fulfill this task may either be readily available within the firm or could be easily acquired on the respective markets (Mata et al. 1995). From a managerial perspective, however, operating

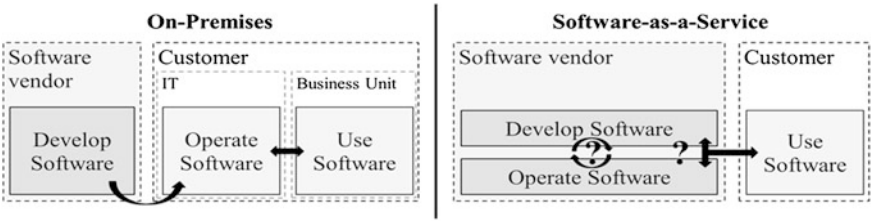


Fig. 1 From on-premises software to Software-as-a-Service

software may lead to an increased need for coordination between the development subunit and the new operations unit, i.e., an increased need for managing dependencies between activities (Thompson 1967; Malone and Crowston 1990). As such, software operation depends on software development activities in order to ensure reliable and efficient service provision (Choudhary 2007a; Fan et al. 2009). Software development activities, in turn, build upon the operations unit to continuously disseminate new functionalities. Previous literature has discussed such an intensive coordination between organizational subunits under the term organizational integration and has linked this concept to firm performance (Barki and Pinsonneault 2005).

While dependencies between the development and operations subunits point to the need for organizational integration, it is not clear which specific activities have to be integrated in order to successfully provide Software-as-a-Service, how coordination and communication between development and operation may entail opportunities for software vendors, and which context factors facilitate or exacerbate organizational integration.

In order to fill this gap, this study links extant literature on Software-as-a-Service and on the constituent characteristics of services to research on organizational integration. By integrating both streams, a framework is deduced that guides our empirical research. In particular, based on this framework and on a multiple-case study of six Software-as-a-Service vendors, we are able to identify challenges and opportunities as well as enablers and inhibitors of organizational integration in the context of these challenges and opportunities.

In doing so, this study contributes to extant literature on Software-as-a-Service in that it is among the first to provide a theory-driven and systematic understanding of the communication and coordination between software development and operation activities. Moreover, it contributes to literature on organizational integration by theoretically linking this research to constituent characteristics of services. The study shows that as a consequence of the service characteristics, challenges and opportunities of organizational integration may relate to content-related as well as time-related dependencies between activities. This study also has practical implications for software vendors that offer Software-as-a-Service or consider switching to this delivery model. As such, software vendors were found to often underestimate the implications of offering Software-as-a-Service and to

consider minor adjustments to be sufficient when adapting to the new context (Heart et al. 2010). The findings of this study guide practitioners by showing that the Software-as-a-Service concept entails challenges and opportunities above and beyond providing the technical cloud infrastructure.

The remainder of the article is organized as follows: First, the Software-as-a-Service concept and the underlying service characteristics are introduced. Subsequently, the concept of organizational integration and its relevance for developing and operating Software-as-a-Service is discussed. The two streams of literature are then integrated in order to deduce a consistent framework for further analysis. After introducing the study's methodology, the framework is filled with empirical findings on challenges and opportunities of organizational integration in the context of Software-as-a-Service development and operations. The paper concludes with a discussion of the study's contribution to extant literature, its managerial implications, its limitations, as well as opportunities for future research.

2 Foundations

2.1 Software-as-a-Service and Service Characteristics

Services are a central part of the software industry in that they complement software artifacts with activities to assist customers in the selection, installation, adaption and operation of software solutions (Buxmann et al. 2013; Messerschmitt and Szyperski 2003). With the Software-as-a-Service delivery and pricing model, a selection of these services are combined with the software package to form a consistent hybrid offering (Böttcher and Meyer 2004). While in an on-premises context, software is licensed to a customer who is also responsible for the installation, operation and maintenance of the software (Buxmann et al. 2013), these activities are provided by the Software-as-a-Service vendor for a recurring subscription fee (Ma 2007; Sääksjärvi 2005). In the Software-as-a-Service context software can, therefore, be regarded as a pre-product within a service process that enables the provision of the application functionalities the customer is paying for. While traditional software vendors can take advantage of the typically low reproduction costs of software (Buxmann et al. 2013), Software-as-a-Service reduces this possibility due to the production costs of providing and operating the service infrastructure.

Within the literature, a number of characteristics that are frequently associated with the Software-as-a-Service concept can be found. As such, Software-as-a-Service solutions are being used through a web browser and have a high level of standardization (Mäkilä et al. 2010; Olsen 2006; Saeed and Jaffar-Ur-Rehmann 2005). Special emphasis is also set on the user interfaces to allow high usability without the need for special user training (Luoma and Rönkkö 2012). With regard to underlying technologies, Software-as-a-Service vendors often rely on multi-tenancy architectures to increase resource utilization and keep operation costs low.

In this approach, multiple customers are using the same instance of an application on the same infrastructure (Aulbach et al. 2008). The delivery model is characterized by low customer-specific integration or installation work (Luoma and Rönkkö 2012; Mäkilä et al. 2010). The software vendor is responsible for providing the solution (Heart et al. 2010; Xin and Levina 2008) and for offering usage-based pricing models to pay for the consumed service (Choudhary 2007b; Mäkilä et al. 2010). Subscription contracts mostly do not involve a long term commitment and can normally be initiated using self-service functions on the provider's websites (Luoma and Rönkkö 2012).

Given its service component, Software-as-a-Service also shares the properties of traditional services. Various attempts to define the service concept resulted in a number of constitutive criteria such as intangibility, heterogeneity, simultaneity, perishability and the existence of an external factor (Fitzsimmons and Fitzsimmons 2011). Due to these idiosyncrasies, the organizational processes to develop services are considered to differ substantially from the development of products (Alam 2002; Dolfsma 2004; Ramaswamy 1994; Stevens and Dimitriadis 2004). In an attempt to unify the various definitions of services, the identified characteristics have been linked to the importance of a customer input within the service process (Sampson and Froehle 2006; Sampson 2001). More specifically, the input of the external factor in the very moment the service is produced and consumed was argued to represent a necessary and sufficient condition of a service (Sampson and Froehle 2006).

Conceptually, this defining condition of a service can be sub-divided into two dimensions of service characteristics that are not mutually exclusive, but have distinct implications for developing and operating Software-as-a-Service. First, the general *existence of an external factor* that provides input to the service process means that software vendors directly interact with end-users. In some cases, on-premises vendors interacted with end-users as well, in particular if vendors have only a small customer base or offer client-specific software. However, the interaction between software vendors and clients used to be mostly confined to the client's IT departments or third-party firms, particularly in the context of standard software products, such as Enterprise Resource Planning (ERP) or Customer Relationship Management (CRM) systems. In a Software-as-a-Service context, by contrast, end-user and software vendor are directly involved in the service fulfillment phase. The general existence of an external factor predominantly influences the question of *what* is developed and offered to the end-user as a service.

Second, the *just-in-time customer input* has implications on the timing of the deployment of the development output to the customer. As such, it influences *when* newly developed code is handed over from development to be deployed and operated. In an on-premises context, newly developed features used to be accumulated and bundled together within new releases (Ruhe and Saliu 2005). By contrast, Software-as-a-Service solutions tend to be continuously and incrementally updated (Choudhary 2007a), resulting in a situation where clients potentially use the most recent version of the software as it is being developed by the provider. Software vendors not just decide on the timeline when specific features are

available on the market and ready to be deployed by IT departments and service providers, but instead vendors can decide on the time when a feature can be used by an end-user. For Software-as-a-Service solutions, no additional parties are involved in the update process that may delay an update and put the latest stage of development on hold.

The key premise of this study is that as a consequence of these two characteristics (*existence of an external factor* and *just-in-time customer input*), the coordination and communication between the involved development and operations functions becomes a key success factor for Software-as-a-Service providers. To reach the goal of an improved understanding of coordination and communication between development and operations, this study draws on literature on organizational integration. This is discussed next.

2.2 Organizational Integration and Software-as-a-Service

Organizational integration is a central construct within different fields of research (Barki and Pinsonneault 2005; García et al. 2008; Pinto and Pinto 1990; Song et al. 1997, 2000). It has been defined as the interconnectivity and coordination between different departments (Barki and Pinsonneault 2005). More specifically, organizational integration reflects the extent to which communication and coordination links between two distinct organizational subunits exist (Barki and Pinsonneault 2005; Ettlie and Reza 1992; Millson and Wilemon 2002). Organizational integration plays a central role as a key determinant of successful product and service development. A positive relationship of collaboration and communication between organizational units involved in the development and the performance of that product or service was found in various studies (Adler 1995; Atuahene-Gima and Evangelista 2000; Cordon-Pozo et al. 2006; Gupta et al. 1986; Pinto and Pinto 1990; Song et al. 1996). Such a positive effect of organizational integration is explained by the increased amount and variety of information available within different subunits and, as a result, a broadened understanding of problems. This broadened understanding was associated with the diverse functional backgrounds of individuals in different departments that are brought into the value creation process (Froehle et al. 2000; Milliken and Martins 1996; Schilling and Hill 1998).

Given that software development and operations can be seen as a special case of the development and diffusion of new products and services, the research results from new product and service development are deemed transferable and applicable in the context of software (Nambisan and Wilemon 2000). Indeed, previous research in software development suggests a link between the integration of focused activities or functions of software development and solutions success (Botzenhardt et al. 2011; Tiwana 2004). However, a theory-driven understanding of the role of organizational integration in developing and operating Software-as-a-Service is still missing.

When offering Software-as-a-Service, software vendors not only have to develop, but also operate software. In other words, a function that was previously provided by external actors (IT departments of clients or third-party providers) has to be fulfilled internally and aligned with development activities. Following extant research, such an internalization of previously external activities may lead to both challenges and opportunities of organizational integration. As such, challenges may result from specialization as a barrier of organizational integration (Lawrence and Lorsch 1969). Goal and frame of reference differences among organizational units lead to greater implementation effort of organizational integration (Barki and Pinsonneault 2005). Units tend to be oriented towards locally focused goals that reflect their corresponding core competency and expertise. At the same time, units can have different frames of references, that is different "shared cognitive structures, assumptions, tacit knowledge, expertise, and expectations" (Barki and Pinsonneault 2005, p. 170). In addition to these challenges, providing Software-as-a-Service may also imply opportunities for software vendors stemming from organizational integration. In particular, previous research distinguished between internal organizational integration (between subunits within the boundaries of the firm) and external organizational integration (coordination and communication with firm-external units) (Barki and Pinsonneault 2005; Millson and Wilemon 2002). Generally, external integration was suggested to require greater efforts to be achieved than internal integration. Therefore, the internalization of software operations as a previously external activity may lead to opportunities for Software-as-a-Service vendors.

Hence, the literature on organizational integration seems a promising foundation to study the challenges and opportunities of coordination and communication between software development and operations. However, a better understanding is needed as to what these challenges and opportunities actually mean in the context of Software-as-a-Services. In order to fill this gap, the next section ties the concept of organizational integration to the constituent characteristics of services, resulting in a framework that allows for theory-driven empirical exploration.

2.3 Research Framework

Based on the previous discussion on constituent characteristics of services as well as organizational integration, a framework can be deduced that integrates the two streams in the context of Software-as-a-Service. This results in a matrix with four cells that distinguish organizational integration challenges and opportunities resulting from different goals and frames of reference and the internalization of previously external activities, as well as from the two identified service characteristics *existence of an external factor* and *just-in-time customer input* (see Fig. 2).

The existence of an external factor, i.e. the direct interaction with end-users, may result in challenges of organizational integration for Software-as-a-Service vendors as the development and operations subunits may vary regarding their

	Existence of an external factor	Just-in-timecustomer input
Integration challenges	Organizational integration challenges caused by the existence of an external factor	Organizational integration challenges caused by just-in-time customer input
Integration opportunities	Organizational integration opportunities enabled by the existence of an external factor	Organizational integration opportunities enabled by just-in-time customer input

Fig. 2 Dimensions of organizational integration

ability to "speak the language of the end-user". As such, software developers may strive for technical excellence, whereas operations staff may rather aim at efficiency and customer satisfaction, thus causing organizational integration challenges (upper left field in Fig. 2). At the same time, however, the direct link to end-users, that used to be in the responsibility of the clients' IT departments or external providers, may also entail opportunities for Software-as-a-Service providers. In particular, this direct link may enable a better understanding of and responsiveness to user requirements and needs (lower left field in Fig. 2).

Similarly, the just-in-time customer input may lead to challenges and opportunities. As such, the required continuous integration of development and deployment may be challenging, given that the two functions used to be provided by different organizations with different people, processes and technologies that follow a potentially different goal orientation and stem from a different frame of reference (upper right field in Fig. 2). On the other hand, the continuous alignment of development and operations may also provide opportunities for software vendors as it may result in smoother technical integration and ultimately better software (lower right field in Fig. 2). In the remainder of this article, the framework shown in Fig. 2 is used to guide our empirical exploration. The following section presents the chosen research design in more detail.

3 Research Method

The goal of this study is to provide an in-depth understanding of organizational integration between Software-as-a-Service development and operations. After having theoretically deduced a classification of organizational integration challenges and opportunities, we aimed at conducting an empirical study that would enable us to obtain a better understanding of the nature of these challenges and opportunities when providing Software-as-a-Service. Specifically, the study aims at unearthing and structuring different themes, i.e. different types of challenges and opportunities of organizational integration that populate the cells of the matrix

Table 1 Analyzed companies and conducted interviews

Case company	Company size	Business model	Interview partners
A	Large	Hybrid	-Developer (A-1),
			-Program director cloud services (A-2),
			-Vice president cloud services (A-3),
			-Solution architect (A-4),
			-Developer (A-5)
B	Large	Hybrid	-Program manager (B-1)
			-Technology consultant (B-2)
			-Solution architect (B-3)
			-Director network solutions (B-4)
C	Large	Hybrid	-Director online services (C-1)
			-Director customer service (C-2)
			-Quality manager (C-3)
D	Large	Pure SaaS	-Vice president customer relations (D-1)
			-Director marketing (D-2)
			-Senior director alliances (D-3)
E	Small	Pure SaaS	-Director development & operations (E-1)
F	Small	Pure SaaS	-Director research & development (F-1)

depicted in Fig. 2. In addition to clarifying what the cells of the matrix mean for Software-as-a-Service providers, we targeted the discovery of contingency factors that act as enabler or inhibitors of the different emerging themes.

In order to achieve this goal, a multiple-case study design was chosen (Yin 2009; Kerlinger and Lee 2000). The study's aim of unearthing themes as well as enablers and inhibitors resembles Sarker and colleagues' recent study on value co-creation (Sarker et al. 2012). Similar to Sarker et al., we sought to distill themes, enablers, and inhibitors from qualitative data gathered via case study research. As opposed to Sarker et al. who conducted a single-case study, our study relies on multiple cases in order to account for differences across organizations. The multiple-case study consisted of six organizations. Table 1 provides an overview of the analyzed cases.

In order to obtain a comprehensive picture of the influence of Software-as-a-Service on software vendors, we decided to include Software-as-a-Service vendors of different size and with varying commitment to the Software-as-a-Service business model. Providers with a full commitment to the service model offer only Software-as-a-Service solutions and are referred to as pure Software-as-a-Service vendors. Providers that also have a traditional on-premises solution in their portfolio are referred to as hybrid providers. Including these hybrid vendors enabled us to draw from the expertise and experiences of developing and marketing software in the traditional way, and reflect on the changes induced by the Software-as-a-Service deployment model. Organizations of varying size were included for two

reasons. First, division of labor and organizational integration aspects vary with the size of organizations. Second, given the novelty of the business model, pure Software-as-a-Service providers are often of smaller size. Generally, hybrid organizations tend to be rather large due to the level of resources that is required to simultaneously provide software via both deployment models.

All analyzed vendors are developing complex business software applications such as ERP or CRM. This focus enabled us to ensure comparability among the cases, as the complexity of knowledge-intensive goods like software solutions is reflected in the underlying processes and organizational structures (Ivari et al. 2001; Walz et al. 1993). Complex solutions were deemed particularly adequate to reveal aspects of organizational integration.

Semi-structured expert interviews with knowledgeable members of the organizations formed the major source of empirical data (Appendix 1 shows a high-level interview guideline). The decision to rely on semi-structured expert interviews is in line with the nature of this study that is exploratory but structured by an a priori framework. Semi-structured interviews offer the advantage of a theory-driven data collection, but still allow open answers and the flexibility to respond to interesting phenomena that emerge throughout the interviews (Stone 1978; Yin 2009). In total, 17 expert interviews were conducted within the six case companies. Within the two smaller companies, one knowledgeable expert was considered sufficient to obtain a comprehensive picture. By contrast, several interviews were required to conceive all facets within the larger case companies. Except for two interviews within case companies A and B, all interviews were conducted in German (the respective quotes were translated to English by the authors). All interviews were recorded and transcribed, resulting in more than 109,000 words of qualitative data. In addition, secondary data, such as company websites, was used to assess the companies according to the sampling dimensions as well as to obtain an overview of the companies' Software-as-a-Service business model.

The qualitative data was analyzed using the software tool NVivo. The analysis of the gathered data was structured by the theoretically deduced framework that is tied to extant literature. The underlying rationale for this approach was to structure the data analysis, but at the same time leave enough flexibility and openness to obtain an understanding of what the different cells of the framework depicted in Fig. 2 mean in the studied context. More specifically, the qualitative data was initially coded referring to the dimensions of the framework. Hence, we coded text fragments that relate to the four cells of the matrix depicted in Fig. 2, that is, "integration challenges resulting from external factor", "integration challenges resulting from just-in-time input", "integration opportunities resulting from external factor", as well as "integration opportunities resulting from just-in-time input" (Miles and Hubermann 1994). In an iterative process, the text fragments were labeled according to different emerging patterns, similar patterns were aggregated and re-labeled, and redundant labels were dropped. Eventually, five consistent themes emerged that represent challenges and opportunities of organizational integration between Software-as-a-Service development and operations. In addition, we compared the cases with each other based on the information we obtained in the interviews as well as an analysis

of secondary data. This revealed three types of enablers and inhibitors that aggravate or facilitate organizational integration in the context of the five themes. The five themes as well as the enablers and inhibitors are discussed subsequently, liberally referring to the qualitative data that instantiate these themes and the enablers and inhibitors within the case companies.

4 Results

4.1 The Role of Integration in Software-as-a-Service Development and Operations

Figure 3 provides an overview of the identified types of challenges and opportunities. We note that our claim is not that these themes of organizational integration are completely independent of each other; rather they represent different perspectives on organizational integration as well as different underlying reasons and objectives. The themes *awareness* and *feedback* deal with integration aspects that result from the existence of an external factor in the service process. The themes *continuity*, *consideration* and *velocity* address integration aspects related to the just-in-time customer input. While the first group is concerned with what is developed and operated, the second group focuses on the timing and flow of development and operation activities. *Awareness*, *continuity*, and *consideration* represent challenges of integrating development and operations, *feedback* and *velocity* are integration opportunities. Table 2 summarizes the five themes.

4.1.1 Awareness

Establishing mutual awareness of both provider-internal parties and their corresponding activities and problems was found to be one of the key challenges of providing Software-as-a-Service. The customer as the external factor in the service process is not only dictating the development costs by its willingness to pay but also the budget available for the operation of the Software-as-a-Service solution. The subscription price is replacing previous payments for licenses, thus reinforcing the pressure on software vendors to tackle development and operation costs. While in an on-premises context, the costs for operation are handled rather independently from the development costs, the service model leads to a combined calculation effort. As a result, the involved external factor in the service process is charged an all-inclusive fee. This implies that simultaneously optimizing the costs of development, operations, and delivery is crucial for being profitable.

	Existence of an external factor	Just-in-time customer input
Integration challenges	**Awareness** Increase the operation-related knowledge of developers	**Continuity** Synchronize activities and processes to reduce bottlenecks between development and operation **Consideration** Account for customers' business activities in scheduling updates
Integration opportunities	**Feedback** Leverage usage-data to improve the solution	**Velocity** Increase innovation capabilities and reduce cycle times of new software releases

Fig. 3 Themes of organizational integration in the Software-as-a-Service context

Table 2 Summary of themes

Theme	Summary
Awareness	-Awareness of cost implications of development decisions
	-Design-to-cost approach through cross-functional teams instead of feature-based excellence
	-Learnings from operation communicated to software developers
Continuity	-Reduced cycle times
	-Need to quickly deploy developed features
	-Necessity for development organization to react quickly if operations issues arise
	-Need to replace old releases in order to maintain operability
Consideration	-Continuous update may not be possible, e.g. for legal reasons such as audits
	-Continuous updates may overwhelm the customer
	-Need to make sure that updates come at the right time
Feedback	-Direct customer contact gives access to information about acceptance of features and patterns of use
	-Can be used for requirements engineering, portfolio planning, prediction of use
	-Information about value of features compared to development costs
	-Relies on strong internal communication to disseminate information
Velocity	-Control over updates remains within vendor organization
	-Enabling to deliver innovation faster to the client
	-No need to bundle features into large releases /release model is challenged
	-Continuity needs to be assured

> In the past, it always had the flavor of software being developed in the classical way and thrown over the fence to be operated. Then, it's too late of course, as you can't influence the way the software works anymore. Not from an application logic, but operations perspective. (A-2)
> It is important that development is not only focused on functionality, but also makes sure that the solutions run efficiently. For this reason, you of course have to establish appropriate mechanisms in the development. (D-1)

In the traditional model, developers did not put much priority on the cost of operations. Even though initiatives to reduce the total cost of ownership (TCO) of software solutions may also have existed in the past, the sustainability of these efforts can be questioned.

> There have been TCO programs in the past, but they never really interested anybody because it did not hurt the company itself. Even when the customers kept on shouting as loud as they could. (A-2)

As a consequence, developers often lacked an understanding of operation complexity that is necessary to estimate the implications of programming a software artifact in a certain way.

> The typical games happened: 'you're too stupid to operate [our solution], you just make it expensive.' It was a very long process to convince [the other side] that it is just not possible to do it cheaper. (A-2)

While in an on-premises context, software vendors often did not have to deal with operation costs in detail, Software-as-a-Service reinforces the need to keep operations costs low.

> It was a rude awakening how expensive the operation of our systems can be. This was previously unnoticed by the company as the customer took care of it. Now, with a Software-as-a-Service offering, the company suddenly bears the costs. (A-2)
> While previously, software companies tried to develop more features and used the feature count as a measurement to assess its competitive position, we are now concentrating on reducing the scope to the relevant and necessary features. (C-1)

As a consequence, developers are required to build up additional knowledge about operations to understand the key cost drivers and challenges of this domain, and thus be able to effectively reduce costs.

> That the software provider itself bears the cost of operation leads to completely new discussions with the developer that they did not know before. It is definitely fruitful and often an eye-opener. (A-2)
> Developers are just not used to deal with Euros. It is a complete new experience for them to get to know the financial impact of their code. (A-2)
> Developers have to know more operations-related aspects than with on-premises software. They have to understand software operations. […] They need to think more about operation aspects. You have to discipline them to develop reliable software (F-1)

In order to address this challenge, software vendors try to include experts of operation activities into development teams and review committees in order to make developers aware of the cost involved in operating their program code.

> Now, we do not just do operations, afterwards, when the product is ready, but we are part of the development organization, not a separated IT. (A-2)
> Right from the beginning, we go for a design-to-cost approach. We know what it is allowed to cost and that's defining the development. It has to be delivered matching these cost targets. We are not talking about development costs but actual resulting operations costs. (A-2)
> Our head of operations is integrated into software development, as he together with the head of development has to approve the functions that are going to be developed. (E-1)

Mutual awareness of software development and operation may also influence a solution's scope and the inclusion of specific features. The knowledge about operations and its costs complements the estimates about development costs to form a clearer picture about the total costs of single features of Software-as-a-Service solutions. Together, this allows for more accurate estimates about the market potential of features.

> I have to consider [the potential of software features]. We, for example, currently do this with different country versions of our solution. What is my potential to sell this? What are the costs of development? What are the costs of provisioning? Then, you have to look at the bottom line whether it is worth it or not. It's not correct that I have to add all sorts of stuff and plenty of it, my perspective is that I have to include the things that will promote sales and make me profitable. (A-2)

By applying effective means of communication and coordination, the development of the software artifact can be guided by its development and operations costs. In addition, a close link between the responsible developers and units operating the development output may further improve the execution quality of the software artifact, as developers not only get access to cost estimates but also realistic performance measures of the system in use.

> We made the experience with our solution that the total cost of ownership aspect was problematic at the beginning. And the learning where the main pitfalls are and where you need to improve is more likely to succeed the closer you are to the actual hosting itself. (A-5)

The challenge to ensure *awareness* relates to the role of specialization in the context of organizational integration. The cases show that development and operations units may indeed have different goals and are embedded in a different frame of reference. The findings support Barki and Pinsonneault's (2005) reasoning that specialization increases integration efforts but also indicate that integration can be used to align the goals and frames of reference. To be in charge for development and operations calls for integration of these two activities. The alignment appears especially crucial in terms of the awareness of costs incurring during the two activities. As a result, priority may shift within development from feature enhancement to operational cost reduction (Aulbach et al. 2008). In addition, aspects related to operation such as reusability, scalability, and availability gain emphasis within development (La and Kim 2009).

4.1.2 Continuity

The second challenge relates to the processes and the synchronization of efforts of stakeholders involved in the innovation process. It describes the avoidance of bottlenecks that are based on problems within the communication and coordination between development and operations departments.

With the introduction of a service offering, new activities and responsibilities are added to the value chain of a software vendor that lead to vendors being able to decide on the timing of the deployment of new features to end-users. However, the new activities need to be integrated into the existing processes and structures. The resulting processes need to be streamlined and activities need to be synchronized in order to avoid waste and bottlenecks. In fact, the output of development only delivers value to the software vendor when it is deployed to the customer, as the customer is paying for the consumption of the service rather than for a license of a software artifact. As a result, it is important to keep the time between development, production, and consumption to a minimum.

A proper communication and coordination between the development and operations units is required to make sure processes are dynamically aligned, given that unaligned processes may result in bottlenecks and the innovation process to come to a halt.

> [Software-as-a-Service has an impact] on the development, as we have to deliver new features quite early and quick, and on operations, as these have to be delivered fast. This means that I deploy something new for the customers and ideally they can use it by tomorrow. Developed today and it is available for the customers tomorrow. This is the challenge for operations. How do we get the output from development to the customer very, very quickly? (A-3)

Thus, collaboration and communication between development and operations is needed to ensure that operations departments are ready to implement developed features and the respective developers are able to quickly react to potential problems arising during the update process.

> If the development team is creating all the new features and the operations team can't deploy them on time for customers or deploy them in a consistent and reliable way, then they become the bottleneck as well. (B-1)

The approach applied within the studied companies to achieve the necessary integration varied. While some companies, as discussed within the theme *awareness*, form cross-functional teams from the beginning of development, others re-design the organizational structure and make the operations unit a sub-division of the development organization. Company F focuses the integration efforts especially on the crucial phase of software deployment and the update process of the existing live systems by forming a team that consists of developers and operators monitoring the process.

> That means that two developers and two operations guys sit together and shut down the servers and follow a procedure to deploy it. (F-1)

An increase in development speed continuously creates new releases that, on the one hand, do not deliver any value without being deployed to the customer and, on the other hand, easily outgrow the operability if old releases are not replaced in the same frequency as new ones are developed. The literature suggests that Software-as-a-Service affects the underlying processes of software development and requires adjustments and integration to account for the new software characteristics as well as the new responsibilities (Espadas et al. 2008; Saeed and Jaffar-Ur-Rehmann 2005; Stuckenberg and Heinzl 2010). Similar to the discussed aspects, internal communication gaps between departments are also seen by de Brentani (1989) as common reasons that hold back development efforts within service development. Well-planned processes are found to be a solution to reduce communication gaps. Due to the just-in-time customer input inherent in services, a lack of collaboration between producing functions becomes apparent much easier for services than for products (Troy et al. 2008). This is in line with the observation that a lack of collaboration between development and operations may result in problems and delays within the update process of solutions. These problems may result in outages or performance drops that are likely to be noticed by customers of the solution.

4.1.3 Consideration

The second challenge resulting from the just-in-time customer input is focused on including the customer's needs and expectations into the decision on the timing and scope of updates to the Software-as-a-Service solution. Although Software-as-a-Service providers are able to deploy new changes to the software without the customers' involvement from a technical update process perspective, challenges remain with regard to the disruption of the customers' business processes. Introducing modifications to existing software components requires a lot of caution and vendors to be considerate of customers' processes and activities.

> There are also various legal issues. Even if we are able to [deploy frequent updates] from a software/technical perspective, the customers would say that they currently do not want [an update], for example because they are having an external audit that does not allow them to change anything within the systems. (A-4)

In addition, the flow of new features may also overstrain the customer as new features need to be understood by the end-user. Sometimes additional training sessions may be necessary that require planning in advance.

> In principle it is feasible [to deploy new features continuously], however you would outdistance the business. We simply need the flexibility to react to the situation of the customer and that is typically a stream of two to three releases. (A-4)
> We know that we are able to deliver every innovation to the customer instantly, however, our customers are struggling to catch up and use all these new functions. (D-1)

The described challenges can be reduced by facilitating the external factor's involvement in the service process. In particular, the direct relationship with the

end-customer can be used to determine the load and potential rush-hours of the system to decide on a more appropriate timing of updates.

> With the hosting operations […] we can make suggestions with regard to the right timing [of an update]. (A-4)

The involvement of the external factor within the fulfillment phase of services emphasizes the importance of the customer interface (Brentani 1989). Changes to this interface, for instance by software updates that alter functionalities, processes, or the visual experience, may disrupt the customer in the daily interactions with the Software-as-a-Service solution and eventually the customer's course of business. "Software development is not an isolated practice confined only in technical fields" (Kakihara 2006, p. 2) anymore and needs to consider the environment and the appropriate timing of software releases to the market.

4.1.4 Feedback

While the existence of an external factor implies challenges for software vendors, it may also provide opportunities. In particular, through Software-as-a-Service, providers may obtain access to more precise knowledge about the customer and, as a result, may increase the information quality throughout the whole innovation process.

The responsibility for the operation and control of the infrastructure the software service is relying on results in a direct relationship with end-users. In an on-premises context, software vendors often maintained a rather limited relationship to end-users, given that third-party firms often assisted the customer with installation, customization, and training. Instead, having the customer interact on a vendor's own infrastructure enables a much more direct approach. A potential advantage of a direct relationship is the possibility to observe the customer's interaction with the software service.

> I do not just have the customer; instead I have the end-users that I otherwise do not reach. (D-1)
>
> We operate the system, we can find out what our customers are doing or what they need. (A-3)
>
> On-premises providers also do not have the transparency, what is actually used, what is actually adopted, what is not accepted. I can't imagine how to actually do this in the on-premises environment. This is just not possible. You have to rely on what you get back verbally. (D-1)

This feedback channel provides valuable information with regard to the customers' general usage patterns of the software artifact.

> We know exactly what is used most, what is not used at all, what is rarely used, and what has a lot of problems. (A-4)

This inside view into the customers' daily activities with the software provides access to huge amounts of data.

> We can see the usage. Not customer data in terms of content, contact data, product descriptions but interactions with the system and the clicks and what is done with the system. We can see the usage and that is the key. We can see the end-user behavior and benchmark it. (D-1)

This information can be of value to various stakeholders in the development and delivery process and support different activities including requirements engineering, portfolio management, sales, and support. Information may reduce wasted infrastructure capacity as it allows forecasting the demand more accurately within the operations department.

> We know when the customers log in, in which session, how long they stayed and how often they requested something. This gives us information about the behavior in terms of system load. (F-1)

The usage patterns can also lead to better estimates about the value of specific features in comparison to the development and delivery cost. Thus, a better basis for decision-making can be achieved with regard to the scope of a solution and the features included. In addition, interaction patterns may indicate errors or hard-to-understand features that result in the customer repeating unnecessary steps or jumping to the help pages for further information.

> With regard to the pay-by-usage and provider-operated solutions it is like this: you get totally different data over the lifetime, during the usage time of the product and these data can help to re-adjust your investment or your quality processes. (A-5)

The analysis of patterns related to requirements engineering is, however, still in its early stages with various unsolved challenges.

> To decide whether it is worth the effort to advance a specific software function based on user behavior data? It is hard to detect which additional functions are required because if the function is not part of the solution it can't be used. I think it is a double-edged sword you need to look at in more detail. To my knowledge, it is not actively used yet but the idea is definitely there. How do I manage to draw conclusions out of it? (A-2)

Hence, with the end-user involved as the external factor in the service fulfillment phase, software vendors get immediate feedback about the offered solution's effectiveness. The feedback can help improve the software service (Saeed and Jaffar-Ur-Rehmann 2005). The analysis of the service usage can provide valuable hints on the reliability of the offering (Banerjee et al. 2010). Existent knowledge and methods from related web-based software used, for instance, in the e-commerce context may guide Software-as-a-Service vendors in realizing such opportunities (Herder 2009; Kenett et al. 2008; Hilbert and Redmiles 1998). All this information, however, only delivers value if it reaches the right stakeholder within the innovation process. Development decisions can only be supported if the information and experience form operating the solution is communicated to the developers and solution architects.

4.1.5 Velocity

Being responsible for development and operations and thus for a considerable portion of the value chain leads to a gain in control of the underlying process. The software artifact does not leave the responsibility and control of the vendor, allowing a reduction of release cycle times and thus an acceleration of the innovation process.

In an on-premises context, the software artifact was finalized by the vendor and sent to the customer for installation and operation. Changes to the original software artifact required to publish an official update, the installation of which was left to the customer's discretion. The vendor did not have control of the process after a software artifact had been shipped to the customer. Within the Software-as-a-Service context, the artifact instead remains within the control of the vendor at all times. Thus, the vendor is enabled to apply modifications to it at any time. The innovation process can be accelerated as new features can be pushed out to the customer base instantaneously without the need to bundle these innovations into update packages that are easier to manage by the customer.

> With Software-as-a-Service, yoúre able to deliver small functionality faster, but the other thing yoúre able to do, is that you are also able to fix stuff. (B-1)

The traditional release approach is challenged, given that software features can be pushed out to the customer on a more continuous basis.

> We have smaller iterations and smaller feature packs than it is the case with classic on-premises solutions. (A-1)

A common characteristic of Software-as-a-Service offerings, especially those of rather new players in the market, is that they start with a small set of core features. Building on these features, the software solution is enhanced over time and at the same time already marketed.

> The most concise step was the iterative working with smaller time slices. Software-as-a-Service is more a little piece finger food tactic. (A-1)

To sum up, software updates can be reduced in scope and released more continuously, leading to shorter development cycles (Olsen 2006). A value-chain wide optimization of the solution can be achieved with less effort than in the traditional approach (Luoma and Rönkkö 2012).

4.2 Enablers and Inhibitors of Organizational Integration

This section discusses three contingency factors that were found to enable or inhibit organizational integration in the context of the five themes. Service mindset, company size and technical harmonization are each described and related to the context of the identified challenges and opportunities. A factor is considered

an enabler when it supports integration efforts and makes them easier to achieve. Inhibiting factors, on the other hand, make organizational integration harder to accomplish.

4.2.1 Service Mindset

Service mindset in this study refers to two different but related aspects. First, it describes the attitude of people involved in the development and operations process towards their solution. Second, it describes the implementation of this attitude. Service mindset means that involved stakeholders regard the offered Software-as-a-Service solution as a service rather than a software product and also implement the necessary adjustments required when dealing with services.

> I think in the context of Software-as-a-Service you have to develop a service. It is not possible to develop a piece of software and afterwards decide to make a service out of it. It is not up to the operations unit to transform a piece of software into a service. I think you have to start with this. You have to decide this in advance and afterwards everybody delivers its part. (A-3)

For instance, the different mindset underlying service development is reflected by the observation that the details running "under the hood" do not need to interest the customer anymore, as long as the promised service can be delivered. The software artifact itself, previously the main output of a software vendor, now takes the role of a pre-product within the service process. It is a prerequisite for the service provision and needs to be transformed into executable functions in the moment of service consumption by the customer. The specifics of the software artifact, e.g. operating system compatibility or used data base system are less important when it comes to customer acceptance. An exception are those features that define the consumable functions or user interfaces.

> As long as we still can manage to provide the services we agreed on with the customer, the customers simply don't need to care about the way we do it. (A-3)

This leads to an increased flexibility within the development function.

> It is a service, we do it today this way and tomorrow we do it differently. How we realize it, to provide the service, always depends on the most cost-efficient option we have. (A-2)

Services may also lead to an altered understanding of quality. While software quality is typically measured by an indicator such as the number of bugs, delays, or budget overruns, quality in the service context is mainly linked to overall customer satisfaction.

> We have role-specific scorecards. Every role has this customer satisfaction aspect included as a metric. You can't neglect this, as it is simply positioned in the middle. It is also feedback for the development and it is precisely measured how the customer satisfaction evolves. […] We also already break this down to functions to evaluate the impact they have. And there we are back to the topic of a close loop that actually makes it possible to measure all this. (D-1)

In our sample, the pure Software-as-a-Service providers tend to have a stronger service mindset compared to vendors with a hybrid approach. To prevent the potentially negative effects of a lack of service mindset, pure Software-as-a-Service vendors go as far as to replace the entire development team.

> We started with an entirely new team. We did not take on anyone of our previous employees. We followed a greenfield strategy with the new company, with new employees, and a new infrastructure, all set up to realize fully-fledged and pure Software-as-a-Service. We did not want legacy, old mindsets, or infrastructure to influence the new software but instead built up an unburdened team. (E-1)

The presence of a service mindset among the people involved in the development and operation process of a Software-as-a-Service solution supports the objectives and goals of all five identified themes. The service mindset increases the recognition of the characteristics of services and the problems and challenges that may be the outcome of these. Stakeholders with a distinct service mindset are expected to be more likely to identify problems that are the result of a service context and thus more likely to find an appropriate solution for them.

4.2.2 Technical Harmonization

Typically, the goal of Software-as-a-Service vendors is to increase the degree of harmonization of the software and infrastructure by sharing resources across the customer base, often referred to as multi-tenancy. In this concept, there is only one or very few instances of the software that is shared among all customers (Aulbach et al. 2008). Even though customers can only access their own data, the data is stored within the same database. By means of a multi-tenancy approach, total cost of ownership can be decreased and new accounts for additional customers can be set up more easily. Especially in conjunction with the widespread use of free trial periods that aim at reducing the uncertainty about the offered service, these two aspects are very beneficial.

> It is a major cost component to have multiple releases running at a time. And a matter of stability because every release is a little different. (A-2)

The use of the concept is related to a reduction of the number of co-existing software versions. Versions in this case do not stand for the marketing tool of different packages that differ in scope and pricing but for different releases with different source code that are results of the further development of the software. The degree of harmonization reflected in the number of simultaneous versions varied within our sample. Pure Software-as-a-Service providers follow a clear one-version approach, whereas hybrid vendors seem to have more problems reducing the number of coexisting releases used by the customers.

> Following the Software-as-a-Service spirit, we always have one version only running with our customers.(E-1)

> According to the Software-as-a-Service concept, as we understand it in our company, there is only one version at any given time. And this one version is there for all customers. (D.1)
> Ideally, there is indeed a short time when we only have one active release. The better we get, the longer this time window gets. But at the moment, we only reach 2 months having only one active release. (A.2)

Technical harmonization is influencing the integration aspects discussed within the themes. Variation among simultaneously operated releases is reduced, allowing to trace back problems to a smaller number of releases and, thus, easing the process to establish a shared understanding and awareness of the specific problems linked to one selected release.

> There is only one version, that's why it is of course much easier to get somebody from development involved without having to set up specific environments that match the customer's settings. (D.1)

Also, organizational integration is positively influenced by the resource focus that comes with a reduction of versions. The communication and coordination requirements are reduced, easing the process flow.

> That is for me the first step within software development that you can concentrate on one release version, on one product. The whole innovation can be put into this [version] and you are much more agile with regard to software development than in the traditional context. (E-1)

The approaches in terms of the release frequency varied between releases in six month cycles and a continuous flow of features, representing a development methodology without thinking in releases. To handle the increased frequency in development, the mindset of releases for example altered from a scope-base approach to a time-based approach. In the latter case, releases are not defined in terms of feature scope to be included but in terms of time available. The scope is then flexible and adjusted with development progress.

The goal to minimize the number of versions may, however, lead to compromises with regard to the ability to align the timing of an update with the customers' activities. With one version, the timing to update is also reduced to only a single timeslot that is used to update the entire customer base to the new version. This makes it more difficult to decide on the most appropriate time that suits all customers and the integration of the customer into this decision is hindered.

> Customers cannot make the decision themselves to stick to one release for 7 years because they would like to do so. (A.4)

By contrast, integration aspects that relate to the *feedback* theme are likely to take advantage of a reduction of the different versions available to the customer. Technical harmonization leads to complexity reduction and makes it easier to interpret the collected data, as it is based on the same software version. The feedback is not blurred by potentially conflicting observations from different implementations within different releases.

4.2.3 Company Size

The company size of a software vendor determines the amount of resources in terms of employees like developers and operators available to participate in the process. The influence of company size was found to vary across the identified themes. As such, next to the dimensions of the research framework, the themes can be differentiated by a rather inward versus outward-oriented perspective. In this vein, the themes *awareness*, *continuity* and *velocity* take a rather inward-oriented perspective on the development and operations activity, while the themes *consideration* and *feedback* reflect organizational integration of development and operations that is directly related to the customer.

Small organizations tend to achieve a higher degree of integration with regard to the inward-oriented development and operations activities, as less people need to get involved with each other. Also the scope of responsibility of one person tends to be bigger as the same variety of development and operations activities need to be spread among a smaller group of people. Less people need to interact with each other, thus, increasing the degree of integration.

In the Software-as-a-Service context, it is more likely that a developer of a small organization is also involved with operations activities or the deployment of the code. Developers may share the same office space with the colleagues responsible for software operations.

By contrast, the integration of outward-oriented activities, such as the analysis of usage patterns or the direct customer interaction, relies on more resources and, therefore, tends to be lower in small organizations. In the Software-as-a-Service context, especially small organizations complained about the increased anonymity of the customer base. As a result of the self-service sign-up for solutions on the providers' websites, direct interaction between sales personnel and the customer is not necessary anymore. Vendors tend to know their customers to a lower extent.

> There are a lot of customers we haven't had any contact with so far because they subscribed to the software online and then they do not attract any attention. (E-1)

At the same time, small vendors do not have sufficient resources to implement the analytics required to identify behavior patterns and thereby derive a better customer understanding.

Based on this discussion, we expect increasing company size to have a negative effect on inward-oriented integration and a rather positive effect on outward-oriented organizational integration. Table 3 summarizes the effect of the three described contingency factors on the integration aspects addressed within the five themes and indicate whether the factor can be considered to be an enabler (+) or inhibitor (–) of organizational integration, that is, whether they aggravate or facilitate organizational integration in the context of the respective theme.

Table 3 Enabling and inhibiting factors of integration

Enabler/inhibitor: Theme:	Service mindset	Technical harmonization	Company size
Awareness	+	+	–
Continuity	+	+	–
Consideration	+	–	+
Feedback	+	+	+
Velocity	+	+	–

5 Discussion

Figure 4 presents the theoretical model that summarizes the different themes of organizational integration as well as the identified context factors that act as enablers and inhibitors of the themes. The study's findings address the questions illustrated in Fig. 1. The five themes, *awareness*, *continuity*, *consideration*, *feedback* and *velocity* provide a better understanding of organizational integration in the context of Software-as-a-Service development and operations. The three identified enablers and inhibitors of integration offer further insights in that they highlight different contingency factors of the themes and demonstrate the complexity of the context, as their impact varies across the different themes.

5.1 Theoretical Implications

Even though previous research has studied Software-as-a-Service from various perspectives, the question of how software development and the newly added operations function are linked with each other from a managerial perspective has not been examined in detail yet. In order to fill this gap, the goal of this study was to provide a comprehensive understanding of organizational integration between the subunits of development and operations in the Software-as-a-Service context. Our results add to previous research by identifying challenges and opportunities of organizational integration that are grounded in empirical findings and embedded in a consistent framework deduced from reference theories. In addition, the three identified enablers and inhibitors help to better understand the influence of surrounding factors on the salience of the five themes of organizational integration.

Our findings show that in addition to providing a technical infrastructure for operating Software-as-a-Service, software vendors that subscribe to the cloud business model have to master a number of challenges. These challenges were found to include the mutual awareness of organizational actors of the cost implications associated with decisions and activities. In addition, in order to ensure a smooth flow of new features from development to operations, and to be able to consider customer needs, development and operations need to be integrated in terms of the dynamic dependencies between activities. Moreover, our findings revealed that the internalization of the operations function also entails

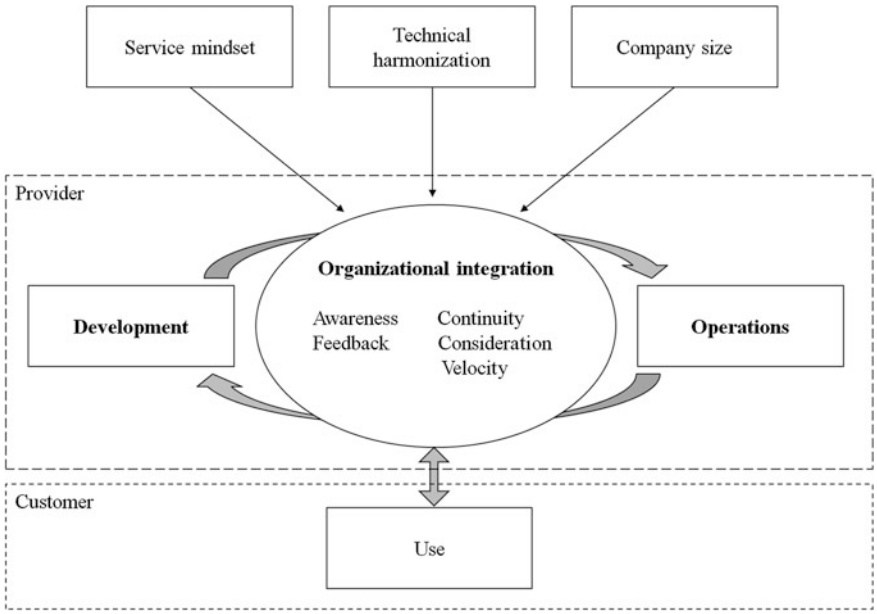


Fig. 4 Model of organizational integration in the Software-as-a-Service context

opportunities for software providers. As such, the direct link to end-users may provide firms with new ways of obtaining feedback, as well as to push out new features and improvements immediately to the customer, thus potentially providing better software than it was possible in an on-premises context.

The identified enablers and inhibitors reveal varying contingencies that influence the salience of the different themes. In other words, these factors identify contexts in which challenges are more or less difficult to overcome, and opportunities are present to a lower or larger extent. Establishing a service mindset among individuals involved in development and operations generally supports organizational integration in the context of Software-as-a-Service solutions. By contrast, the software product characteristics and technologies summarized under the term technical harmonization have varying implications on organizational integration. On one hand, keeping the number of coexisting software versions small facilitates awareness and continuity, and also enables software vendors to benefit from the opportunities of Software-as-a-Service. On the other hand, technical harmonization introduces new challenges that affect customers and may harm their perception of the quality of the solution. Moreover, the findings stress challenges and opportunities that require special attention by small and large organizations respectively. Small firms may find it easier to achieve inward-oriented integration than larger companies, but may struggle in establishing customer links due to resource restrictions.

These findings provide novel insights into potential reasons why software vendors that are in a transition process towards Software-as-a-Service may face

different challenges than firms that were originally founded as Software-as-a-Service companies. Vendors that started directly with Software-as-a-Service tend to have a stronger service mindset and to start on a higher level of technological harmonization. Hybrid providers, by contrast, may struggle with changing established structures and processes. Their developers may still be thinking in terms of products instead of services and rely on technologies and architectures from the traditional business model. The number of coexisting versions is a clear indicator in this context. While pure Software-as-a-Service providers tend to apply a one-version-only approach, hybrids are less restrictive, often reflecting the assumption that a larger number of versions may enable a higher degree of responsiveness to customer needs.

Our study also contributes to extant literature on organizational integration by theoretically linking the concept to the constituent characteristics of services. Previous research has identified a number of types of organizational integration such as functional versus operational, or internal versus external (Barki and Pinsonneault 2005; Lawrence and Lorsch 1969; Millson and Wilemon 2002). That is, organizational integration was categorized based on where it is situated in an organization's value chain. Given that this study examines the transformation from external-operational-forward to internal-operational organizational integration, our focus is on two of these types. In addition, linking the literature on organizational integration to service characteristics enabled us to drill down from a value chain perspective to the level of activities and reveal two types of organizational integration that were not in the focus of previous studies. More specifically, we distinguished between organizational integration themes that result from the general existence of an external factor on one hand, and the just-in-time customer input on the other hand. In fact, our findings demonstrate that some activities of Software-as-a-Service development and operations show dependencies that are content-related (cost awareness and customer feedback), whereas others are rather time-related (continuity of activities, velocity of deploying features, consideration of customer wishes in terms of update timing). The distinction between content-related and time-related integration has wider implications for existing literature on organizational integration. Previous research suggests that organizational integration may be hindered by conflicts stemming from power and politics, while the positive effect of organizational integration may be attenuated or even reversed in turbulent environments (Barki and Pinsonneault 2005). The distinction between content-related and time-related organizational integration and the related themes may act as a foundation for further research on these organizational and environmental contingencies, given that politics and power issues may particularly hinder organizational integration regarding content-related activities, while environmental turbulences may be especially problematic when integrating time-related activities.

In addition, this study adds to previous work by providing a better understanding of different goals and frames of reference in the context of Software-as-a-Service as well as of the consequences of internalizing previously external activities. In particular, previous studies suggested that internal organizational integration

implies less effort than external integration, and that differences in goals and frames of references across organizational units may hinder organizational integration (Barki and Pinsonneault 2005). The themes as well as enablers and inhibitors that emerged from our multiple-case study clarify what these propositions mean in the context of Software-as-a-Service. Moreover, while previous research clearly distinguished between internal and external units, this study shows that technical advances may turn formerly external units, such as software operations, into internal ones, resulting in various challenges and opportunities of organizational integration that are reflected by the identified themes.

Furthermore, previous literature proposed that organizational integration of operational activities leads to a higher degree of efficiency than the integration of functional activities, whereas integrating functional activities increases effectiveness more than integrating operational activities (Barki and Pinsonneault 2005). While the setting of this study does not allow us to systematically compare the integration of operational as opposed to functional activities, our results may add interesting empirical insights to this debate. First, the results show that organizational integration of software operations may indeed increase efficiency if cost awareness and continuity between activities is ensured. However, the results of our study also suggest that in the case of Software-as-a-Service, the organizational integration of operational activities may result in substantial effectiveness gains as well. In particular, when developing on-premises software, vendors had to mostly rely on market research or their field organizations in order to obtain knowledge on customer requirements. By contrast, the *feedback* theme shows that the external factor involvement in combination with technological advances may enable software vendors to obtain customer insights that go beyond explicitly expressed customer wishes. For instance, by observing system usage patterns and actual end-user behavior, Software-as-a-Service vendors may be enabled to more effectively gain customer insights. In other words, effectiveness may substantially be increased as a direct consequence of the internalization of the primary activity of software operations.

5.2 Managerial Implications

In addition to the theoretical contributions, this study's findings have important implications for managers in the software industry. As such, decision makers within software vendors that consider switching to or complementing their existing product portfolio with a Software-as-a-Service deployment model may learn about challenges that need to be overcome in order to successfully compete in the Software-as-a-Service market. Specifically, managers need to make sure that development and operations functions are integrated so that members of both divisions are aware of each other's processes and synchronize activities. Moreover, managers have to ensure that customers' business activities are considered when planning update schedules. Both, pure and hybrid Software-as-a-Service vendors gain

insights into opportunities potentially resulting from the service model. Organizational integration efforts may enable vendors to innovate at a higher pace and leverage the customer feedback resulting from direct interaction. In addition, decision makers are guided as to which factors influence these challenges and opportunities in different circumstances. While company size cannot easily be influenced, service mindset and technological harmonization may be within the control of software vendors.

The findings show that small vendors have to pay particular attention to the anonymity inherent in Software-as-a-Service offerings. In the traditional model, having a close and intimate relationship with customers was considered one of the core assets of small software vendors (Mathiassen and Vainio 2007). Given that small firms may lack the resources to leverage technology-enabled customer interaction as described in the *feedback* theme, these vendors have to find alternative ways to tailor the offered software to customer needs. Large software vendors, instead, have to be aware of the challenges of internal organizational integration, given that large firms may be more prone to issues related to different goals and frames of reference.

The study shows that technical harmonization can be an enabler of organizational integration. This is particularly important for hybrid vendors, given that these firms often tend to stick to legacy technologies and architectures. Embracing Software-as-a-Service concepts such as multi-tenancy may enable these firms to seize the opportunities of a transition to Software-as-a-Service. Both, hybrid and pure vendors should be aware of the trade-off implied by technical harmonization. While it may help overcome challenges of organizational integration and take advantage of opportunities, technical harmonization may also hinder responding to customer-specific wishes. Generally, Software-as-a-Service vendors should be aware of the necessity to establish a service mindset.

5.3 Limitations and Future Research

This study has a number of limitations that offer potential for future research. First of all, the case selection only offers a snap-shot view and is limited to software vendors of complex business applications. This view may be broadened in the future. In particular, longitudinal studies may yield additional insights with regard to the transformation process of traditional on-premises vendors towards Software-as-a-Service. Second, our perspective on Software-as-a-Service operations as an activity that used to be external but is internalized focuses on internal integration and neglects other relationships to external suppliers or partners. A broader perspective on partner networks and the implications of Software-as-a-Service on business models of complementors (e.g., integrators) may extend the view of this study. Furthermore, the identified contingency factors of organizational integration offer promising opportunities for future research. For instance, future studies may address the question of how service mindsets can be established and of how technical harmonization can be achieved.

6 Conclusion

Motivated by the growing importance of the Software-as-a-Service concept and the identified gap in extant literature, the goal of this study was to provide a better understanding of the implications of Software-as-a-Service on software vendors. In order to reach this goal, we integrated existing literature on the constituent characteristics of services and on organizational integration in order to derive a consistent framework that guided our empirical research. The findings of the multiple-case study show that Software-as-a-Service results in challenges and opportunities of organizational integration, reflected by the five themes *awareness*, *continuity*, *consideration*, *feedback*, and *velocity*. The results also show that the salience of these themes is contingent upon the *service mindset* among employees, the degree of *technical harmonization,* as well as *company size*. The study contributes to previous work on Software-as-a-Service and on organizational integration. Moreover, the results provide guidance for decision makers within the software industry.

A.1 7 Appendix 1: High Level Interview Guidelines

A. Information regarding company and interview partner

1. Interviewee's position within organization, role regarding Software-as-a-Service development and operation, interviewee's experience

B. Inward-oriented integration

1. Describe the development and operation processes of your Software-as-a-Service solution.
2. Are development and operations separated or integrated processes within your organization? What interfaces exist between the two areas?
3. Does Software-as-a-Service require special technologies? Do these technologies have an impact on the development and operation processes?

C. Outward-oriented integration

1. Does Software-as-a-Service change the way customers are integrated / involved in the development and processes in general?
2. Does your organization create an advantage out of the direct customer relationship?
3. Does the changed customer relationship have implications on a process level?

References

Adler, P. S. (1995). Interdepartmental interdependence and coordination: The case of the design/manufacturing interface. *Organization Science, 6*(2), 147–167.

Alam, I. (2002). An exploratory investigation of user involvement in new service development. *Journal of the Academy of Marketing Science, 30*(3), 250–261.

Atuahene-Gima, K., & Evangelista, F. (2000). Cross-functional influence in new product development: An exploratory study of marketing and R&D perspectives. *Management Science, 46*(10), 1269–1284.

Aulbach, S., Grust, T., Jacobs, D., Kemper, A., & Rittinger, J. (2008). *Multi-tenant databases for software as a service: Schema-mapping techniques. In Proceedings of the 2008 ACM SIGMOD International Conference on Management of Data*, *Vancouver, Canada* (pp. 1195–1206). New York: ACM.

Banerjee, S., Srikanth, H., & Cukic, B. (2010) *Log-based reliability analysis of software as a service (SaaS). In 2010 IEEE 21st International Symposium on Software Reliability Engineering (ISSRE) San Jose, CA* (pp. 239–248). November 1–4, 2010.

Barki, H., & Pinsonneault, A. (2005). A model of organizational integration, implementation effort, and performance. *Organization Science, 16*(2), 165–179.

Benlian, A., & Hess, T. (2009). Welche Treiber lassen SaaS auch in Grossunternehmen zum Erfolg werden? Eine Empirische Analyse der SaaS-Adoption auf Basis der Transaktionskostentheorie. In R. H. Hansen, D. Karagiannis & H. G. Fill (Eds.), *Wirtschaftsinformatik*, *Austria, Vienna* (pp. 567–576). February 25–27, 2010.

Böttcher, M., & Meyer, K. (2004). IT-basierte Dienstleistungen. In K. P. Fähnrich & C. van Hussen (Eds.), *Entwicklung IT-Basierter Dienstleistungen in der Praxis - Kurzstudie Zum Co-Design Von Software Und Services in Deutschen Unternehmen* (pp. 10–20). Stuttgart: Fraunhofer IRB-Verlag.

Botzenhardt, A., Meth, H., & Maedche, A. (2011). *Cross-functional integration of product management and product design in application software development: Exploration of success factors. In International Conference on Information Systems*, *Shanghai, China*.

Brentani, U. (1989). Success and failure in new industrial services. *Journal of Product Innovation Management, 6*(4), 239–258.

Buxmann, P., Diefenbach, H., & Hess, T. (2013). *The software industry—economic principles, strategies, perspectives*. Berlin: Springer.

Choudhary, V. (2007a). Comparison of software quality under perpetual licensing and software-as-a-service. *Journal of Management Information Systems, 24*(2), 141–165.

Choudhary, V. (2007b). Software-as-a-Service: Implications for investment in software development. In R. H. Sprague (Ed.), *40th Hawaii International Conference on System Sciences*, *Waikoloa, Hawaii*. January 3–6, 2007b. IEEE.

Cordon-Pozo, E., Garcia-Morales, J., & Aragon-Correa, J. (2006). Inter-departmental collaboration and new product development success: a study on the collaboration between marketing and R&D in Spanish high-technology firms. *International Journal of Technology Management, 35*(1), 52–73.

Dolfsma, W. (2004). The process pf new service development—issues of formalization and appropriability. *International Journal of Innovation Management, 8*(3), 319–337.

Espadas, J., Concha, D., & Arturo, M. (2008). Application development over Software-as-a-Service platforms. In H. Mannaert, T. Ohta, C. Dini & R. Pellerin (Eds.), *The Third International Conference on Software Engineering Advances*, *Sliema, Malta* (pp. 97–104). October 26–31, 2008.

Ettlie, J. E., & Reza, E. M. (1992). Organizational integration and process innovation. *Academy of Management Journal, 35*(4), 795–827.

Fan, M., Kumar, S., & Whinston, A. B. (2009). Short-term and long-term competition between providers of shrink-wrap software and software as a service. *European Journal of Operational Research, 196*(2), 661–671.

Fitzsimmons, J., & Fitzsimmons, M. (2011). *Service management: operations, strategy, information technology* (Vol. 7). New York: McGraw Hill.

Froehle, C. M., Roth, A. V., Chase, R. B., & Voss, C. A. (2000). Antecedents of new service development effectiveness. *Journal of Service Research, 3*(1), 3–17.

García, N., Sanzo, M. J., & Trespalacios, J. A. (2008). New product internal performance and market performance: Evidence from Spanish firms regarding the role of trust, interfunctional integration, and innovation type. *Technovation, 28*(11), 713–725.

Gupta, A. K., Raj, S. P., & Wilemon, D. (1986). A model for studying research-and-development—marketing interface in the product innovation process. *Journal of Marketing, 50*(2), 7–17.

Heart, T., Tsur, N. S., & Pliskin, N. (2010). Software-as-a-Service vendors: Are they ready to successfully deliver? In I. Oshri & J. Kotlarsky (Eds.), *Global sourcing of information technology and business processes* (Vol. 55, pp. 151–184). Lecture notes in business information processing Berlin, Heidelberg: Springer.

Herder, E. (2009). *Forward, back and home again—analyzing user behavior on the web*. Saarbrücken: VDM Dr. Müller.

Hilbert, D. M., & Redmiles, D. F. (1998). *An approach to large-scale collection of application usage data over the Internet*. *In International Conference on Software Engineering* (pp. 136–145). Kyoto, Japan: IEEE Computer Society.

Hilkert, D., Wolf, C. M., Benlian, A., & Hess, T. (2010). *The "as-a-Service"-paradigm and its implications for the software industry—insights from a comparative case study in CRM software ecosystems*. *In First International Conference on Software Business (ICSOB 2010), Jyväskylä, Finland*. June 21–23, 2010.

Ivari, J., Hirschheim, R., & Klein, H. K. (2001). *Towards more professional information systems development: ISD as knowledge work. In European Conference on Information Systems, Bled, Slovenia*.

Kakihara, M. (2006). Developing Software-as-a-Service in the rapidly changing environment. *International Review of Business, 8*, 1–17.

Kenett, R. S., Harel, A., & Ruggeri, F. (2008). Controlling the usability of web services. *International Journal of Software Engineering and Knowledge Engineering,19*(5), 627–651.

Kerlinger, F. N., & Lee, H. B. (2000). *Foundations of behavioral research*. Fort Worth, TX: Harcourt College Publishers.

La, H., & Kim, S. (2009). A systematic process for developing high quality saas cloud services. In M. Jaatun, G. Zhao & C. Rong (Eds.), *Cloud computing* (pp. 278–289). Lecture notes in computer science Berlin, Heidelberg: Springer.

Lawrence, P., & Lorsch, J. (1969). *Organization and environment*. Boston, MA: Harvard Business School Press.

Luoma, E., & Rönkkö, M. (2012). Software-as-a-Service business models. *Communications of Cloud Software*, *1*(1).

Ma, D. (2007). *The business model of "software-as-a-service"*. Paper presented at the IEEE international conference on services computing (SCC 2007), Salt Lake City, USA, July 9–13.

Mäkilä, T., Järvi, A., Rönkkö, M., & Nissilä, J. (2010). How to define software-as-a-service—an empirical study of finnish SaaS providers. In P. Tyrväinen, S. Jansen & M. A. Cusumano (Eds.), *Software business* (pp. 115–124). Lecture notes in business information processing Berlin, Heidelberg: Springer.

Malone, T. W., Crowston, K. (1990). *What is coordination theory and how can it help design cooperative work systems? In Proceedings of the 1990 ACM Conference on Computer-Supported Cooperative Work* (pp. 357–370). Los Angeles, CA: ACM.

Mata, F. J., Fuerst, W. L., & Barney, J. B. (1995). Information technology and sustained competitive advantage: a resource-based analysis. *MIS Quarterly, 19*(4), 487–505.

Mathiassen, L., & Vainio, A. M. (2007). Dynamic capabilities in small software firms: a sense-and-respond approach. *IEEE Transactions on Engineering Management, 54*(3), 522–538.

Merz, S., Eschinger, C., Eid, T., Pang, C., & Wurster, L. (2011). Forecast: Software as a Service, Worldwide, 2010–2015, 1H11 Update. Market Analysis and Statistics. Gartner Research.

Messerschmitt, D. G., & Szyperski, C. (2003). *Software ecosystem*. Cambridge: The MIT Press.

Miles, M. B., & Hubermann, A. M. (1994). *Qualitative data analysis: an expanded sourcebook* (Vol. 2). Thousand Oaks, CA: Sage Publications.

Milliken, F. J., & Martins, L. L. (1996). Searching for common threads: Understanding the multiple effects of diversity in organizational groups. *The Academy of Management Review, 21*(2), 402–433.

Millson, M. R., & Wilemon, D. (2002). The impact of organizational integration and product development proficiency on market success. *Industrial Marketing Management, 31*(1), 1–23.

Nambisan, S., & Wilemon, D. (2000). Software development and new product development: potentials for cross-domain knowledge sharing. *IEEE Transactions on Engineering Management, 47*(2), 211–220.

NIST NIoSaT. (2011). *The NIST definition of cloud computing*. Gaithersburg: National Institute of Standards and Technology.

Ojala, A., & Tyrväinen, P. (2011). Value networks in cloud computing. *Journal of Business Strategy, 32*(6), 40–49.

Olsen, R. (2006). *Transitioning to software as a service: Realigning software engineering practices with the new business model. In IEEE International Conference on Service Operations and Logistics, and Informatics, Shanghai, China* (pp. 266–271). June 21–23, 2006, IEEE.

Pinto, M. B., & Pinto, J. K. (1990). Project team communication and cross-functional cooperation in new program development. *Journal of Product Innovation Management, 7*(3), 200–212.

Ramaswamy, R. (1994). *Design and management of service processes: Keeping customers for life*. Reading, MA, USA: AddisonWesley.

Ruhe, G., & Saliu, M. O. (2005). The art and science of software release planning. *IEEE Software, 22*(6), 47–53.

Sääksjärvi, M., Lassila, A. & Nordström, H. (2005). Evaluating the software as a service business model: From CPU time-sharing to online innovation sharing. In P. Isaisas, P. Kommers & M. Mc-Pherson (Eds.), *IADIS International Conference e-Society 2005, Qawra, Malta* (pp. 177–186). June 27–30, 2005.

Saeed. M., Jaffar-Ur-Rehmann, M. (2005). Enhancement of software engineering by shifting from software product to software service. In W. Khan & F. Ahmed (Eds.), *First International Conference on Information and Communication Technologies (ICICT)*, *Karachi, Pakistan* (pp. 302–308). August 27–28, 2005.

Sampson, S. (2001). *Understanding service businesses: applying principles of the unified service theory* (Vol. 2). New York: Wiley.

Sampson, S., & Froehle, C. M. (2006). Foundations and implications of a proposed unified service theory. *Production and Operations Management, 15*(2), 329–343.

Sarker, S., Sarker, S., & Sahaym, A. (2012). Exploring value cocreation in relationships between an ERP vendor and its partners: A revelatory case study. *MIS Quarterly, 36*(1), 317–338.

Schilling, M. A., & Hill, C. W. L. (1998). Managing the new product development process: Strategic imperatives. *The Academy of Management Executive (1993–2005), 12*(3), 67–81.

Schuetz, S., Kude, T., & Popp, K. M. (2013). *The Impact of Software-as-a-Service on software ecosystems. In International Conference on Software Business (ICSOB)*, *Potsdam.*

Song, X. M., Montoya-Weiss, M. M., & Schmidt, J. B. (1997). Antecedents and consequences of cross-functional cooperation: A comparison of R&D, manufacturing, and marketing perspectives. *Journal of Product Innovation Management, 14*(1), 35–47.

Song, X. M., Neeley, S. M., & Zhao, Y. Z. (1996). Managing R&D—marketing integration in the new product development process. *Industrial Marketing Management, 25*(6), 545–553.

Song, X. M., Xie, J., & Dyer, B. (2000). Antecedents and consequences of marketing managers' conflict-handling behaviors. *The Journal of Marketing, 64*(1), 50–66.

Stevens, E., & Dimitriadis, S. (2004). New service development through the lens of organisational learning: evidence from longitudinal case studies. *Journal of Business Research, 57*(10), 1074–1084.

Stone, E. (1978). *Research methods in organizational behavior*. Santa Monica, CA: Goodyear Publishing Company Inc.

Stuckenberg, S., Fielt, E., & Loser, T. (2011). *The impact of Software-as-a-Service on business models of leading software vendors: Experiences from three explorative case studies. In Pacific Asia Conference on Information Systems, Brisbane, Australia*.

Stuckenberg, S., & Heinzl, A. (2010). *The impact of the Software-as-a-Service concept on the underlying software and service development processes. In Pacific Asia Conference on Information Systems, Taipei, Taiwan* (pp. 1297–1308).

Thompson, J. (1967). *Organizations in action*. New York: Mc Graw-Hill.

Tiwana, A. (2004). An empirical study of the effect of knowledge integration on software development performance. *Information and Software Technology, 46*(13), 899–906.

Troy, L., Hirunyawipada, T., & Paswan, A. (2008). Cross-functional integration and new product success: an empirical investigation of the findings. *Journal of Marketing, 72*(6), 132–146.

Tyrväinen, P., & Selin, J. (2011). How to sell SaaS: A model for main factors of marketing and selling software-as-a-service. In B. Regnell, I. Weerd & O. Troye (Eds.), *Software business (ICSOB 2011), Brussels, Belgium, June 8–10, 2011, 2011* (pp. 2–16)., Lecture notes in business information processing Berlin Heidelberg: Springer.

Walz, D. B., Elam, J. J., & Curtis, B. (1993). Inside a software design team: Knowledge acquisition, sharing, and integration. *Communication of the ACM, 36*(10), 63–77.

Weinhardt, C., Anandasivam, A., Blau, B., Borissov, N., Meinl, T., Michalk, W., et al. (2009). Cloud computing—a classification, business models, and research directions. *Business & Information Systems Engineering, 1*(5), 391–399.

West, M., McNee, B., Geisehecker, L., Guptill, B., McNeill, R., & Burns, C. (2010). *Key SaaS, PaaS and IaaS trends through 2015: Business transformation via the cloud*. USA: Saugatuck Technology Inc.

Wu, W.-W., Lan, L. W., & Lee, Y.-T. (2011). Exploring decisive factors affecting an organization's SaaS adoption: A case study. *International Journal of Information Management, 31*(6), 556–563.

Xin, M., & Levina, N. (2008). Software-as-a Service model: Elaborating client-side adoption factors. In R. Boland, M. Limayem & B. Pentland (Eds.), *29th International Conference on Information Systems, Paris, France*. December 14–17, 2008.

Yin, R. K. (2009). *Case study research - design and methods*. Thousand Oaks: Sage Publications.

Part V
International Growth: The Case of China

The Development of IT Service Quality Standards in China

Mike Gallivan and Chen Tao

Abstract The process of developing IT-based standards has recently being labeled "a critical research frontier for IS research". Within the last half-dozen years, IS scholars have begun to examine a variety of domains in which standards-setting occurred. Many of these studies have focused on international telecommunications standards in Asia. Despite the number and diversity of the many empirical studies, most have focused on technical standards for ICT interoperability. We consider the creation and dissemination of a distinct type of standard, known as "IT service management standards", which are a type of process standards specific to IT vendors. To our knowledge, the subject of establishing service measurement standards has not been considered in the IS literature. We review the growing literature on standards-setting and standards-adoption, and we inquire whether the issues that consistently accompany the development process for technical standards for IT and telecommunications interoperability will generalize to the process of developing IT service measurement standards. We describe a case study of the development of standards for measuring IT services in China. Rather than analyzing our data according to a specific theory, we compare the results to date of China's creation of IT service standards to the phenomena frequently observed in prior IS studies of standards-setting. We argue that several recurring phenomena that accompany prior standards-setting initiatives in the IS literature (i.e., conflict among parties, warring factions, etc.) are lacking in our study. We speculate about the reasons why conflict is absent and develop proposition that can be evaluated with future case data.

Keywords Standard-setting · Conflict · Battle · IT services · Service quality

M. Gallivan (✉)
CIS Department, Robinson College of Business, Georgia State University, Atlanta, GA, USA
e-mail: mgallivan@gsu.edu

C. Tao
College of Public Administration, Huazhong University of Science & Technology, Wuhan, China

R. Hirschheim et al. (eds.), *Information Systems Outsourcing*, Progress in IS,
DOI 10.1007/978-3-662-43820-6_14

1 Introduction

The process of developing IT-based standards is a phenomenon that had been neglected in the IS literature for decades—only recently being identified as "a critical research frontier for IS research" (King and Lyytinen 2006). Despite the great importance of technical standards to ensuring IT compatibility and integration in the global economy, prior to 2005, few IS scholars turned their attention to the processes and challenges of IT standards-setting. This has begun to change recently. Within the last half-dozen years, IS scholars have begun to examine a variety of domains in which standards-setting occurred. Many of these empirical studies have focused on international telecommunications standards in Asia, specifically in China and Korea (Gao 2007, 2008; Lee and Oh 2006; Yoo et al. 2005). This emerging set of studies on IT-based standardization initiatives can be classified in many ways—based on the geographic venue, the specific technologies in question, or the theoretical perspective employed by the authors. Despite the diversity in each of these dimensions, the vast majority have focused on technical standards for IT and telecommunications interoperability.[1] In this paper, we consider the creation and dissemination of a distinct type of standard, known as "IT service management standards" (McNaughton et al. 2010), which are a type of process measures (Davenport 2005) specific to IT vendors. To our knowledge, the process of creating and disseminating service measurement standards have not previously been examined in the IS literature. In contrast, over a dozen cases have examined the creation and adoption of technical standards for IT and telecommunications interoperability.

We review the burgeoning IS literature on standards-setting and standards-adoption, and we inquire whether the same issues that consistently accompany the development process for technical standards for IT and telecommunications interoperability will generalize to the process of developing IT service measurement standards. We describe a country-level case study of the development of standards for measuring and managing IT services in China. Given the novelty of this type of standard-setting process, as well as the fact that the process is still ongoing, our study is atheoretical. Rather than analyzing our data according to a pre-specified theory, we compare the results to date of China's development of IT service standards to the types of phenomena frequently observed in prior IS studies of standards-setting, regardless of their theoretical perspectives. We argue that several consistent phenomena that accompany prior standards-setting initiatives in the IS literature (i.e., conflict among parties, the metaphor of warring factions, and the notion of "winners" and "losers" in the standards-setting process) appear to be lacking in our industry case study. We speculate about the reasons why such conflict is absent: is it the type of standards undergoing development that ensure the presence or absence of conflict? Is there some aspect of the participative process employed in our case study, in conjunction with attributes of the Chinese

[1] Such standards are labeled as "IT product standardization" by Markus et al. (2006).

national culture (i.e., collectivistic) and the absence of foreign (non-Chinese) players that ensure a lack of conflict? We discuss the evidence for each of these emergent explanations to show the ways in which China's process for creating IT service measurement standards differs from prior studies of technical standards for IT and telecommunications interoperability.

2 Literature Review

Although the problem of competing interests in standards-setting has been a longstanding issue of concern for economists and R&D scholars (e.g., Farrell and Saloner 1985), IS scholars have been somewhat "late to the party"—in terms of exhibiting interest in such issues. Before 2000, there were just a few scattered studies in the IS literature, generally focused on the power asymmetries that often accompany EDI adoption among dominant buyers or suppliers in a given industry (e.g., Hart and Saunders 1997; Webster 1995). Until the time that *MIS Quarterly* circulated its 2003 call for papers for a special issue on standards (King and Lyytinen 2003), no studies had appeared in the IS literature examining the process of creating and negotiating standards, although there were studies of firms' decision of whether to adopt standards already established (e.g., Chau and Tam 1997; Hart and Saunders 1998; Webster 1995). Of course, standardization has been identified as a key antecedent in studies of other IS phenomena—such as in firms' readiness for rapid deployment of IT (Broadbent et al. 1999) or countries' development of a successful Internet presence (Montealegre 1999). Like other forms of infrastructure, common standards may have little economic value in themselves (Broadbent et al. 1999), but such standards are tremendously important to in providing the groundwork for the economic value of functions and capabilities that leverage them.

Since the time of the *MIS Quarterly* call for papers, which labeled this topic a "critical research frontier for information systems" (King and Lyytinen 2003), many studies of standard-setting processes have emerged—both in that special issue, which appeared in 2006 (King and Lyytinen 2006), as well as in several other venues (e.g., Gao 2007; Lee and Oh 2006; McNaughton et al. 2010; Wigand et al. 2005). It is notable that most of these studies have focused on one of two domains—either standards for mobile and wireless telecommunications in Asia (Gao 2007, 2008; Lee and Oh 2006; Yoo et al. 2005), or the U.S. residential mortgage industry (Markus et al. 2006; Steinfield et al. 2006; Wigand et al. 2005). The two domains, as defined by country and industry, account for the vast majority of studies on standards-setting to date. Table 1 summarizes these IS studies, in terms of the specific standard examined, the country/industry setting, and the theoretical perspective examined. We have organized Table 1 into two separate sections—with the first section identifying studies of standard-setting processes; the second section of Table 1 identifies studies of firms' decisions to adopt (or not) standards that are *already* established.

Table 1 Information systems studies focusing on standards

Author	Journal	Phenomenon	Theory	Issues related to conflict
Studies that focus on standards-setting process (i.e., creation and negotiation of standards)				
Wigand et al. (2005)	JMIS	Vertical IS in real estate industry	Transaction cost economics	*Not examined*
Lee and Oh (2006)	JSIS	WAPI in China (wireless LAN authentication and privacy infra.)	Actor-network theory	High: conflict between Chinese versus U.S. telecom vendors
Markus et al. (2006)	MISQ	Vertical IS (VIS) standardization in U.S. real estate industry	Collection action dilemmas	Moderate: conflict occurs between dominant versus less-dominant firms
Yoo et al. (2005)	JSIS	CDMA standard for mobile telecom in Korea (2G and 3G)	Actor-network theory (consider regulatory regime, innovation system, and marketplace)	Moderate: conflict between U.S.-based Qualcomm versus non-Qualcomm camps
Backhouse et al. (2006)	MISQ	IT security standards	"Circuits of power" theory (Clegg 1989)	Low: few instances of conflict occurred
Gao (2007)	ISJ	WLAN in China	Actor-network theory (introduce notion of "counternetworks")	High: conflict b/w defensive network (+); challenge network (−)
Gao (2008)	CAIS	WAPI in China (wireless LAN authentication and privacy infra.)	No specific theory	High: conflict between Chinese versus U.S. telecom vendors (e.g., Broadcom, Intel)
Studies that focus on standards adoption from perspective of individual firms or buyers-suppliers				
Webster (1995)	JSIS	EDI adoption by UK auto manufacturers and their suppliers	No specific theory (focus on buyer power and technology skills)	Conflicts between large buyers ("hubs") versus small supplier firms
Chau and Tam (1997)	MISQ	Companies' adoption of open standards (e.g., UNIX versus Windows)	Diffusion of innovation theory	*Not examined*
Hart and Saunders (1998)	JMIS	EDI adoption by US retails and suppliers	No specific theory (focus on coercive power versus trust)	Conflicts between some (but not all) large buyers and small suppliers

Table 1 (continued)

Author	Journal	Phenomenon	Theory	Issues related to conflict
Weitzel et al. (2006)	MISQ	The impact of standardization cost, network effects, and network topology on diffusion behaviors	Network effect theory (network topology)	*Not examined*
Zhu et al. (2006)	MISQ	Replacing proprietary IT systems with open standards (UNIX)	Network effects and path dependency	*Not examined* Current EDI users perceive high switching costs as adoption barrier

In summarizing the available studies in the first section, we noticed that one area of diversity in these studies was the theoretical lens employed. The majority of standardization studies in the IS literature employ Actor-Network theory as a theoretical lens (e.g., Lee and Oh 2006; Gao 2007; Yoo et al. 2005), although there are exceptions—such as studies that identify "collective action dilemmas" (Markus et al. 2006) or Clegg's "circuits of power" theory (Backhouse et al. 2006). Several studies were atheoretical (e.g., Hart and Saunders 1998; Webster 1995) although they examined the power of IT to drive changes in industry structure—often referred to as the "electronic markets vs. electronic hierarchies" dichotomy (Malone et al. 1987).

Some atheoretical studies specifically examined the role of coercive power (e.g., Hart and Saunders 1997; Webster 1995) to force smaller firms to adopt an established standard even when it was not in their immediate best interest. In addition to the notion of coercive power (Hart and Saunders 1997), we observed that conflict and resistance were themes that frequently appeared. This may be inherent in the definition of standard-setting, which is defined by most authors as attempting to negotiate agreement among heterogeneous interest groups (e.g., Markus et al. 2006). Studies of standards-setting both within and external to the IS literature are replete with the imagery of conflict. In fact, the very titles of such studies feature words like battle (Lyytinen and Fomin 2002), revolution (Lyytinen and King 2002), war (Lee and Oh 2006) and resistance (Gao 2008). Does the fact that previous studies have privileged the importance of conflict, warring factions, and the notion of "winners" and "losers" in these standard-setting studies mean that such conflict is inevitable? A brief glance at the upper half of Table 1 suggests that the answer is yes.

While such conflicts often occur between opposing interest groups, various authors have located the underlying rationale for conflict in different explanations. Some authors have identified the warring factions as based upon a technology firm's country affiliation—such as between U.S. versus Chinese wireless Internet and broadband providers (e.g., Lee and Oh 2006; Gao 2007). In some cases, the

battle lines were not so neatly defined by nationality. For instance, in one study of 3G telecommunications standards in Korea, the authors identified competing "camps"—which they labeled as Qualcomm versus non-Qualcomm camps.[2] Other authors have identified inherent differences between the goals of buyers and suppliers (Hart and Saunders 1997) or, in some cases, between similar suppliers but depending their current levels of dominance in the industry (high dominance versus low dominance) (Markus et al. 2006). Regardless of its origins, conflict appears to be pervasive in the process of developing, promoting, and enforcing standards.

Based on the growing number of studies of standards-setting initiatives to date, it appears to be a "given" that conflict is inherent to the process. Yet, we advise caution before jumping to this conclusion. Given the relative immaturity of the set of standard-setting studies in the IS literature we remain open to the possibility that conflict need not always accompany standard-setting.

In reviewing the IS studies, we first note that not all technology standards serve similar functions. In their studies of the U.S. market for residential mortgages, the team of authors (e.g., Markus et al. 2006; Wigand et al. 2005) distinguish between what they label "IT product standardization" versus "vertical information systems standardization" (or VIS). While the first term refers to the types of compatibility standards required for IT hardware and software (especially telecommunications technologies) to interoperate, VIS standards refer to specific industry sectors' creation of "product identification, data definitions, business document layout or business process sequences" (Wigand et al. 2005, p. 167). Although the type of standard-setting initiative we investigate is distinct from the VIS standards considered by Markus et al. (2006), theirs was the first study in the literature to articulate the fact that not all standards have the same scope or serve the same objectives. Some standards are intended to be global in their reach—in terms of spanning multiple industries, if not continents; other standards are deliberately confined to a specific industry sector, as well as to a specific country or geographic region.

According to Markus et al., standards that seek to define IT product interoperability differ in several ways from vertical IS standards. We, too, consider a novel type of standard, which is described as "IT service management standards" (McNaughton et al. 2010) in the IS literature. This type of standard is similar to what Davenport (2005) describes in his article, "The Coming Commoditization of Processes"—essentially a description of the types of services offered by IT vendors, as well as relevant metrics for describing the quantity and quality of outputs delivered. Since the type of standards we examine differs from the more often-mentioned class of IT product standardization, we do not assume that the attributes that have characterized previous cases of standards-setting processes should generalize to IT service management standards. As Markus et al. (2006) have

[2] Qualcomm is a California-based telecommunications firm that was active in the 3G initiative in Korea.

done, we consider it useful to approach the study of this standard-setting initiative in China with an open mind. In acknowledging the pervasiveness of conflict and "battle" imagery in the existing literature, we have no a priori expectation about whether we will find conflict, warring factions, or winners and losers in our study of China's IT service standards.

Below, we present data from China which, for the past few years, has been rapidly developing and pilot testing standards for measuring IT service units and service quality. Such standards for defining processes and for measuring various process attributes—including quality—are known to be critical in enabling services outsourcing (Davenport 2005). In China, the creation of such standards to describe various metrics of quantity and quality of IT services is especially urgent. The current market for domestic IT outsourcing in China is small and underdeveloped; moreover, outsourcing has rarely been a topic of empirical analysis in the IS literature.[3] Although many large and small IT vendors exist in China (Carmel et al. 2008), there is little historical precedent for Chinese firms to outsource IT services or other business functions (e.g., BPO).

3 Research Methods

The country case study we present was conducted over a 3 year period from early 2009 to January 2012. We characterize our research method as participant-observation (Van Maanen 1979, 1988). This approach to collecting field data has previously been employed in IS research (e.g., Myers 1999; Nandhakumar and Jones 1997). The first author participated in a series of three meetings that were hosted by China's IT Service Management Working Group (hereafter labeled as SMWG).[4] The SMWG hosted a series of meetings in eight major cities in China to solicit input from various participants. The first author traveled to attend three of the meetings in various geographic regions: in southwestern China in 2009,[5] in south-central China in 2010,[6] and in northeastern China (Beijing) in 2011. Simultaneously, the SMWG hosted additional meetings in large cities in other geographic regions[7]—which the author did not attend, but whose outcomes were included in the SMWG's proposals and subsequent pilot testing.

Most participants in the SMWG were representatives of IT vendors (about 70 %), with most others being Chinese government employees working for

[3] At least, this is true for empirical studies in "international" journals—those in North America or Europe.

[4] See http://www.itss.cn.

[5] The meeting in southwest China was held in Dujiangyan (Szechuan province), close to Chengdu—the site of the May 2008 earthquake.

[6] The meeting in south-central China was held in Enshi (Hubei province).

[7] Other regional sites for the meetings were at: Chongching, Guangdong, Hainan, and Qingdao.

research institutes, who were assigned to work full-time on this standards development initiative (30 %). The first author was the only academic researcher participating in the SMWG. During the various regional meetings, participants listened to presentations made by various members regarding the overall goals for measuring service quality, various measurement standards already in existence (e.g., ISO and ITIL), and discussions about the relative advantages and disadvantages of existing standards vis-à-vis creation of new standards. When the decision was made to bypass the better-known, international standards for IT services and develop new metrics based on ServQual (Parasuraman et al. 1991), the SMWG participants also reviewed proposed changes to typical ServQual items and the proposed process for collecting pilot study data to evaluate their suitability.

4 History of the Service Management Working Group

To promote the development of the IT service and BPO industry in China, several leading IT vendors and research institutes created the SMWG in April 2009. The stated objective of the group was to evaluate and develop IT service and BPO service standards that would be applicable to clients and vendors of IT outsourcing and BPO services in China. Although the immediate focus was on serving domestic (i.e., Chinese) client firms, it was also expected that development of such standards would also facilitate the future growth of the offshore IT outsourcing and BPO markets (i.e., for foreign client firms). The goal of the standards initiative was to help IT vendors to describe, measure, and easily contact for various IT services and, in addition, to measure various attributes including reliability, quality, etc.

From the start, the SMWG proposed a comprehensive service standards framework, which was divided into five components, including general standards, IS integration and operational standards, IT service management and governance standards, IT outsourcing and service model standards and industry-specific application standards. Following the creation and dissemination of this comprehensive framework in early 2009, additional IT vendors and research institutes were invited to join the SMWG. SMWG intended for the framework to be widely adopted by IT vendors, as a measurement and diagnostic tool which could allow them to capture data about their service quality, as well as to identify necessary areas for improvement. In addition, it also seeks provide a standard set of metrics about IT vendors that could be made available to client firms seeking information about vendors, which they could incorporate into their decision-making.

The proposed IT service quality model measures the quality of IT service from five dimensions: security, reliability, tangibles, responsiveness, empathy (See Fig. 1). Security consists of all aspects of an IT services provider's ability to protect the security of information and related resources. Reliability refers to the vendor's ability to provide services dependably and accurately according to the service agreement. Responsiveness is the willingness to help clients and to ensure prompt service. Tangible refers to the appearance of physical facilities, equipment and

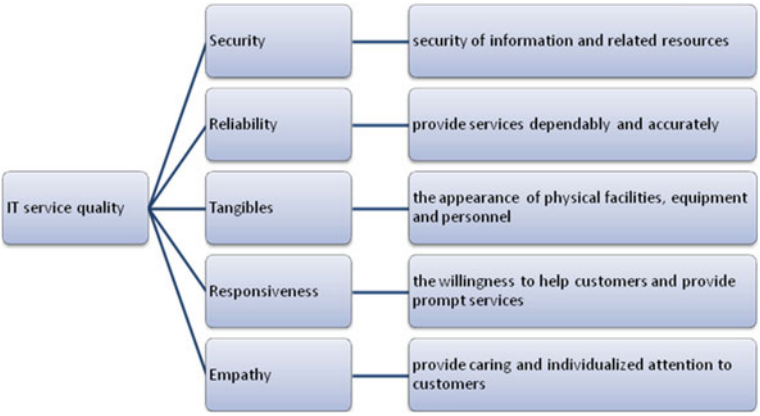


Fig. 1 Dimensions of IT service quality model

personnel that the vendor presents in the service process. Empathy is the degree to which the vendor provides caring and individualized attention to customers.

This model is identical to the set of ServQUAL constructs that originated in the field of marketing (Parasuraman et al. 1991), except that the "assurance" dimension from Marketing is replaced by "security." However, a more important modification that the SMWG choose was to avoid using perceptual, Likert scale items, as much as possible, but to substitute objective, quantitative indicators for each attribute. For example, responsiveness, could be measured by several quantitative items. The speed of the vendor's response (i.e., in terms of elapsed time) to service requests would be recorded for all services. The timeliness of vendor response rate could then be calculated as the ratio of all requests that were fulfilled in a timely manner, measured in fractional terms ranging from zero to 1.0. Timeliness could also be extended to measuring the vendor's timely response to client problems or complaints, as well as to standard services.

By choosing to employ objective, quantitative measures—rather than perceptual Likert scale items—the SWMG sought to automate the measurement process during the process of service provision, rather than having to capture clients' perceptual data separately and after the time of service provision. Participants believed that capturing objective, quantitative data would facilitate benchmarking of vendors' performance against standards, thus facilitating continuous monitoring, as well as continuous improvement of quality. As part of its standards development process, the SMWG sought to specify not only how to collect these objective indicators, but also how clients and vendors could utilize the measures in improving future performance. Currently, the details of these objective measures are still under development, with regional pilot tests conducted in several geographic regions of China during 2011 (see below). As part of the overall plan, the SMWG seeks to modify and improve these standards, after collecting and

Table 2 Overall time schedule for developing it service quality standard (translated from Mandarin to English by the authors)

Time	Agenda item
2009	Proposal of IT service quality standard
	Build IT service quality model
	Design metrics and evaluation methods
	Draft IT service quality standard
2010	Pilot test of IT service quality standard in eight provinces and cities
2011	Modification of IT service quality standard based on pilot test responses
	Develop database to collect IT service quality data
	Discuss IT service quality standardization in ISO/IEC JTC 1/SC 7 meeting in India
2012	Further pilot test of IT service quality standards
	Empirical validation of IT service quality measurement based on statistical data analysis
	Further modify and improve standards

evaluating the pilot data. Table 2 describes the overall planning agenda for the SMWG.

5 Pilot Test of IT Service Quality Standard

Starting in October in 2010, the pilot tests of the proposed standard were conducted in eight cities and/or provinces: Beijing, Shanghai, Guangdong, Hubei, Chongqing, Chengdu, Shenyang and Hangzhou. In each city or province, several local IT vendors participating in the SMWG began to collect data for evaluating the proposed measures. The purpose of this work is to examine the acceptance and utility of the measures from the perspective of both IT service vendors and client firms with the goal of capturing feedback, combining it with other, regional feedback, and later, revising the measures and standards.

The first author's direct observation of the process occurred in two of the eight regional pilot locations—in Shanghai and Hubei province. As part of this phase of data collection, he attended planning meetings, conducted interviews with responsible client, vendor, and government officials from Shanghai and Hubei. In addition, he was able to secure actual data (both quantitative and qualitative) captured during the pilot process, with the stipulation that this data would be used for academic research.

In terms of its IT industry, Shanghai is one of the most developed cities in China. In 2010, the revenue of Shanghai's IT service industry was 180.0 billion RMB ($28 billion U.S.). A total of eight IT vendors from Shanghai participated in the standard pilot test, as shown in Table 3.

Each IT vendor participating in pilot data collection was required to review every item within the proposed set of IT services standards and evaluate whether

Table 3 IT vendors in Shanghai participating in pilot testing

Company name	Industry served
iSOFT Infrastructure software Co., Ltd	Comprehensive
Yitong International Co., Ltd	Retailing
Nantian Computer System Co., Ltd	Financial services
Tianji Science Co., Ltd	Comprehensive
Wanda Information Co., Ltd	Comprehensive
Yatai Computer Information System Co., Ltd	Comprehensive
Shanghai 30wish Information Security Co., Ltd	Information security
Hanwei IT Consulting Co., Ltd	IT consulting service

Metrics	Whether applicable	service quality score	Suggestions to improve it
Security indicator 1	☐ Applicable ☐ NOT Applicable	X<0.3 (Very Poor) 0.3≤X<0.5 (Poor) 0.5≤X<0.7 (Average) 0.7≤X<0.9 (good) 0.9≤X (Very good)	
Security indicator 2	☐ Applicable ☐ NOT Applicable	X<0.3 (Very Poor) 0.3≤X<0.5 (Poor) 0.5≤X<0.7 (Average) 0.7≤X<0.9 (good) 0.9≤X (Very good)	
...	...	...	
Overall, do you think this measurement is applicable?			

Fig. 2 Example of Shanghai IT vendors' self-evaluations

the items were applicable to the services they provided. Each vendor then completed a written evaluation form, specifying the degree to which each item was applicable. In addition, they were invited to provide open-ended feedback. Figure 2, shows one section of the evaluation form that vendors completed. Results from the Shanghai vendors were analyzed before the data in the second region (Hubei providence) were collected.

Of the eight participating IT vendors from Shanghai, four firms considered the entire set of proposed standards to be completely applicable to their business. Of the remaining vendors, three considered the measures to be "generally applicable," only one vendor did not consider the proposed measures to be applicable. Moreover, after 6 months of using the proposed standards, two vendors reported

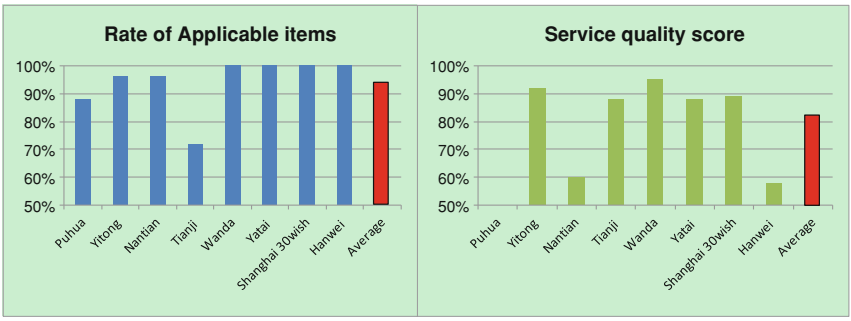


Fig. 3 Shanghai IT vendors beliefs about item applicability and self-reported quality

Table 4 IT vendors in Hubei province participating in pilot testing

Company name	Industry served
Lilosoft Digital Co., Ltd	Government
Xingde Science Co., Ltd	Energy
Sunflower Network Security Co., Ltd	Information security
Haiguang Science Co., Ltd	Government
Navimentum Information System Co., Ltd	Comprehensive
Dongrun Science Co., Ltd	Government
Xinan Information System Co., Ltd	Education
Wuhan 30wish Information Technology Co., Ltd	Steel manufacturing

their firm's service quality as "very good" (above 90 %) while three others evaluated their firm's service quality as "good" (above 70 %) and two evaluated their quality as "average" (above 50 %). One vendor (Puhua) did not self-report its level of service quality.

Hubei is a large province located in south-central China, with a less developed IT sector than that in Shanghai. Revenues from Hubei's IT services sector were 32.6 billion RMB in 2010 ($5 billion U.S.). Similar to Shanghai, eight IT vendors from Hubei province participated in the pilot test. Seven of the vendors were located in Hubei's largest city of over 10 million people, Wuhan (Fig. 3) (Table 4).

Similar to their Shanghai counterparts, the Hubei IT vendors were asked to collect data about their performance for 6 months, and then provide feedback on the level of "fit" between the proposed measurement items and their business. In addition, they were asked to self-evaluate their own performance during this time period. In contrast to the vendors in Shanghai, most vendors in Hubei believed that it was difficult to provide quantitative evaluations of their IT service quality. The primary explanation offered by many vendors was that they had less experience providing a range of IT services, compared to vendors in Shanghai. The level of experience and maturity of Hubei's vendors in describing and measuring their IT

services was low. This was due to the fact that many standard processes had not yet been defined, and thus, they could not provide the necessary data for a quantitative self-evaluation. However, most of the vendors who responded considered the proposed standards to be basically applicable to their business. In addition, they generally believed that adoption of these standards could help them to improve their IT service management process and service quality.

The Appendix contains details of the open-ended feedback provided by IT vendors in both regions—Shanghai and Hubei. Based on this feedback, as well as similar data that other SMWG participants collected from vendors in the eight other regions, there was a general sense that the measures needed to be further refined, with additional data collected for validation purposes in the future. Moreover, vendors expressed some concerns regarding their ability to automatically collect quantitative data to capture their levels of IT service quality. They are also concerned that numeric data would be used as a static "rating" of the firms' capabilities—which may dissuade potential clients from choosing them if their service quality ratings are lower than other vendors.

Concurrent with the pilot data collection in Shanghai and Hubei province, first-round pilot were also been collected in six other geographic regions. As was the case in Hubei province, most of this feedback is qualitative data—rather than numeric data reporting vendors' service quality. For each of these regions, the next stage will be to collect quantitative data in all pilot regions.

A major meeting of the ISO Joint Technical Committee (sub-committee 7)[8] occured in Jeju city, Korea from May 19–25, 2012.[9] At that time the SMWG reported the results of the pilot test data to ISO Joint Technical Committee, and the remaining steps of the process were identified. These may include revising the proposed measurement items and customizing the items for distinct vendor types or distinct types of IT service activities that they offer.

6 Discussion

The standard-setting process described in the case study is still in progress; however, to date there has been little evidence of conflict, warring factions, or other problems that have accompanied most of the standard-setting studies that appeared in the IS literature. There are a range of features that distinguish our case study from other published studies—including the fact that the initiative we examined concerns "IT service management standards" (McNaughton et al. 2010), rather than IT product standardization processes (Markus et al. 2006). Other features that distinguish our case study include the fact that it takes place in China,

[8] For details of ISO Joint Technical Committee http://www.sqi.gu.edu.au/sc7/mirror/organisation.html.

[9] For a description of the proposed meeting of the SC7, please see http://www.sc7jeju2012.kr.

which is a country known for its collectivist and long-term approach to problems and solutions (Hofstede and Bond 1988). Although several other standards initiatives described in the IS literature also took place in China (e.g., Gao 2007, 2008; Lee and Oh 2006), those standard-setting initiatives were characterized by the rivalry between non-local (i.e., U.S.) telecommunications firms and domestic Chinese firms. In our case study, all participating members are Chinese—IT vendors, employees from China's research institutes, and client firms. Thus, there is a lack of international representation in the initiative we have examined—which could be one possible pre-condition for conflict to occur.

Of course, other standards initiatives described in the IS literature have been domestic (i.e., within a given country) as well, including studies of the U.S. residential mortgage industry (Markus et al. 2006), U.S. retailing (Hart and Saunders 1997), UK automotive parts supply chain and UK home improvement chain stores supply chain (Webster 1995). All of these case studies clearly illustrate conflict among warring factions. In fact, Webster (1995) aptly described the type of power plays that occur when large, dominant "hub" firms coerce smaller "spoke" firms to embrace a given IT standard (in this case, the early 1990s standard: electronic data interchange):

> These [EDI] innovations reflect a set of supply-chain relationships … based on the domination of large and powerful companies over their less powerful trading partners. Because of their purchasing power, the 'hubs' in the trading network can dictate the terms on which they do business with the 'spokes'. They use EDI to heighten their control over their trading relationships and, as the case of Ford demonstrates, they may even enshrine this control in the EDI system itself. In [the process of 'hubs'] pursuing their agendas for … locking the trading partners into trading relationships with them, these powerful players have unilaterally imposed their own [systems, processes, and standards] … upon their trading partners … dictating product and inventory coding according to their own established in-house systems…. The spokes are left with little choice but to conform to the trading terms, conditions, and systems dictated by the hubs. Moreover, [spokes] have little or no influence over the development of these EDI networks. They are forced to adopt the systems and information handling procedures developed by their major customers (Webster 1995, p. 37).

If there is any question that the battle for dominance between large "hubs" (powerful buyers, such as Ford) and small auto parts suppliers described in Webster's study of the UK automotive parts network is unique, she dispels that notion by illustrating the same phenomena elsewhere:

> There are other examples of companies outside the automotive industry using EDI to [enforce] coercive trading practices. In retailing, the British [home improvement retail] store, W. H. Smith's … developed EDI in 1987. Its message to its suppliers, referring to EDI and business respectively, was 'get in or get out'. (Webster 1995, p. 34).

Based on these descriptions of the use of EDI in the UK, it does not seem that a domestic setting—one lacking international actors—is sufficient to ensure a lack of conflict. Markus et al. (2006) demonstrate that even similar parties (i.e., domestic vendors) can exhibit conflict, when one set of firms enjoys dominance in the industry and seeks to extend it by locking-in customers to their proprietary systems; in

contrast, less-dominant vendors welcome the development of new, open standards that may allow them to reach potential customers, regardless of their firm's lack of proprietary systems, their low numbers of customers, etc. Thus, even within a single nation and a single industry, conflict and rivalry still occur among players.

Given that standards-setting processes that occur within a "domestic" (i.e., single nation) setting are not immune to conflict and warring factions, what is it about our case study of standards setting in China that appears to free it from conflict? We offer the following explanations for possible reasons why conflict has not emerged in our case study to date.

Proposition 1 If the nature of standards being developed is for purposes of developing a classification of industry-specific processes—and associated metrics for quantity and quality—then conflict is less likely to occur, relative to standards initiatives that focus on IT product standardization of hardware or software.

Proposition 2 If the venue for a standards-setting initiative is one characterized by a collectivist national culture (Hofstede 2001), conflict in a standards initiative is less likely to occur.

Proposition 3 If the participants in a standards-setting initiative lack obvious heterogeneity (i.e., diversity) with regard to the anticipated impact of the standards being developed, then conflict is unlikely to occur.

At this point, we have identified three explanations for the lack of conflict we observed in the case study of IT service measurement standards. We acknowledge that it is possible that the underlying conditions for the second explanation (Proposition 2) could change, if a broader variety of participants—including firms from individualistic cultures are allowed a voice in the standard-setting process (including IT vendors from the U.S., UK, etc.). Likewise, the underlying conditions specified by the last explanation (Proposition 3), could also change in the future, if a broader array of firms with differing interests are allowed to join the SMWG. For example, if smaller or start-up IT vendors become involved in the process, we would be able to observe whether such diversity engenders conflict—or if conflict is still absent. Of the three potential explanations we offer, only the conditions corresponding to Proposition 1 are unlikely to change. We believe that our Proposition 1 is key in terms of highlighting the process accompanying different types of standards. Although the type of standards in our case study is distinct from the VIS standards analyzed by Markus et al. (2006), we concur with those authors that it is important to consider the actual nature of the standards—rather than to assume that all standard-setting initiatives are alike, in terms of forcing heterogeneous interest groups to compete.

Based on these propositions, as well as our role as participant-observers (Myers 1999) in the ongoing development of China's IT service measurement standards, we will continue to follow this initiative and search for evidence of intra-faction conflict or its absence. Despite the fact that the initiative is still ongoing, we believe that more empirical studies of standards-setting initiatives similar to our study (i.e., studies of IT service management standards) are required. Our study is

but one instance of the class of standard-setting processes described by Davenport (2005). In articulating why such efforts will become more pervasive within many industries, he specifies three related objectives that such standards can achieve, which include defining: (1) process activities (2) process performance standards; (3) process management standards (Davenport 2005, p. 3).

We hope to see more such studies of standard-setting initiatives that concern industry-specific process specifications and metrics for assessing quantity and quality in the future. To the extent that such studies, like ours, are characterized by a lack of conflict, this will provide evidence in support of our Proposition 1. Conversely, to the extent that other such studies of service measurement standards *do* experience conflict, such evidence may weaken or undermine our Proposition 1 (Lee 1989).

A.1 7 Appendix: Company Feedback from IT Vendor Firms in Shanghai and Hubei (Translated from Mandarin to English by the Authors)

Companies	Comments and suggestions
	Comments from Shanghai vendors
Yitong international	In the dimension of reliability, there is overlap and correlation among several indicators: the rate of serious incidents, the rate of continuous service operation, and the rate of major security incidents. Maybe it can be measured by the client's degree of satisfaction with the SLA. However, according to our situation, many clients do not define the SLA in the contract clearly, which will make it difficult for the overall assessment
	The ratio of services delivered upon the first requests may not be an appropriate indicator. Although most service requests could just be solved in the telephone, as the user access the hotline, but it is not always the case. Some problems that are not emergent and cannot be solved immediately can be recorded and forwarded to experts. It should be a more appropriate way to notify the user when the problem is solved
	The rate of service report submitted also depends on the agreement with the user and the customer's type of business. Telecommunications companies, for example, never submitted a user service report, which is not directly related to its quality of service
	Several indicators are not cleared defined (e.g., corporate brand, qualification in industry, market share). There are no clear criteria that can be referred
	There are some indicators associated with whether the service norms are established, but the applicability of the norms is not taken in account
Yatai	In the security dimension, the ratio of unauthorized data changes to the total number of data changes is calculated as an indicator. The problem is how to record the change events and ensure the authenticity of the records

(continued)

(continued)

Companies	Comments and suggestions
Hanwei consulting	It is suggested to include the rate of repeated failures solved as an indicator of reliability. It is defined as the ratio of the number of the same (repeat) requests to the total service requests
Puhua	It will be good to develop some industry-specific standards, so that the measurement of the service quality will be more applicable
Tianji	Requires quantitative evaluation of the terms, such as marked quantitative content, conducive to enterprise with reference to specific data validation and assessment
Wanda	The service quality model should be adaptable to be fit for situations of different companies
Nantian	There are several indicators on compliance, which means whether the services are achieved based on corresponding norms and standards. In fact, these indicators are of little significance, but also difficult to operationalize, because in many cases the appropriate norms or standards are not available
	The indicator of the ratio of requests processed is actually difficult to operate, because usually we can only record the number of service requests that we received—not the number of requests that we do not complete. It is suggested to delete this indicator
Shanghai 30wish	It is too idealistic to try to build general quality standards for various types of IT services. In fact, it is also not conducive to wide adoption of IT services standards in the future. It is recommended that the working group should develop different service quality measurement for various types of IT services
	Comments from Hubei vendors (south-central China)
Xingde	Those indicators on compliance are very difficult to understand and operationalize. It's not clear which norms and standards should be referred
	For the dimension of security, it is not clear whether all the data owned by a client is considered, or if it only refers to the data provided by the vendor
	There are too many indicators in the service quality evaluation model. It needs to be customized in order to fit the different types of IT services
	There is paradox between the qualitative nature of the index and the quantitative metrics. For example, the "completeness of function" is very difficult to quantify according to a service catalog. In practical operation, we can replace completeness with reliability, which can be measured by the ratio of timely responses or effective solutions to the number of such requests
Wuhan 30wish	It's very difficult to develop a general IT service quality measurement system, because different types of IT services will vary greatly in their content and delivery mode. Even for the same general type of IT service (IT operations and maintenance services), they can be divided into different service subclass with different quality requirements
	For some indicators related to our IT operation and maintenance practices, we may have different requirement, sometimes better than the standards. For example, as to the dimension of tangibles, we require not only deliverable documentation stage by stage, but also visible evidence of service process on ITSM platform

(continued)

(continued)

Companies	Comments and suggestions
	Some indicators are not clearly defined and even unreasonable, and there are some overlaps between several items
	Some metrics are too idealistic or complex to be used in actual practice. For example, the rate of confidentiality accidents does not make sense because these kinds of accidents are usually never allowed in service agreements
Navimentum	The service quality model is too versatile. In the service delivery process, even the services of operation and maintenance for software applications are different from services of operation and maintenance for hardware system. Although the model can be modified according to different service categories. It doesn't give appropriate guidance on how to adapt the model. If it can be modified arbitrarily, then what's the significance and value of the standard?
	Some of the indicators are very difficult to use for operations. Many items should be defined in the service agreement, but in the actual situation, many contracts are very simple and do not include these data. It's therefore difficult to evaluate the service quality
Lilosoft	In the actual situation, the different IT services have different characteristics. It's necessarily to modify the measurement system to evaluate different services. There are no specific guidelines on how to modify and choose the dimension and metrics
Sunflower	It is not reasonable to simply assume that there is a generic IT service quality measurement model. Some relevant standards such as ITIL, ISO20000, etc. are all process based to define the quality of services. There is no general method to quantify the service quality or evaluate the service level
Dongrun	The overall service quality model is relatively reasonable, but the metrics should be more specific and detailed. It should be adaptable to be fit for the features of different types of services, otherwise it would be difficult to use in the actual operation

References

Backhouse, J., Hsu, C., & Silva, L. (2006). Circuits of power in creating *de jure* standards: shaping an international information systems security standard. *MIS Quarterly, 30*, 413–438.

Broadbent, M., Weill, P. & St. Clair, D. (1999). The implications of IT infrastructure for business process redesign, *MIS Quarterly*, *23*, 159–182.

Carmel, E., Gao, G., & Zhang, N. (2008). The maturing chinese offshore it services industry: It takes 10 years to sharpen a sword. *MIS Quarterly Executive, 7*(4), 157–170.

Chau, P. Y., & Tam, K. (1997). Factors affecting the adoption of open systems. *MIS Quarterly, 21*, 1–24.

Clegg, S. R. (1989). *Frameworks of power*. CA: Thousand Oaks Sage Press.

Davenport, T.D. (2005). The coming commoditization of processes. *Harvard Business Review* 1–8.

Farrell, J., & Saloner, G. (1985). Standardization, compatibility, and innovation. *Rand Journal of Economics, 16*(1), 70–83.

Gao, P. (2007). Counter-networks in standardization: A perspective of developing countries. *Information Systems Journal, 17*(4), 391–420.

Gao, P. (2008). WAPI: A Chinese attempt to establish wireless standards and the international coalition that resisted. *Communications of the AIS, 23*(1), 151–162.

Hart, P., & Saunders, C. S. (1997). Power and trust: Critical factors in the adoption and use of electronic data interchange. *Organization Science, 8*, 23–38.

Hart, P., & Saunders, C. S. (1998). Emerging electronic partnerships: Antecedents and dimensions of EDI use from the supplier's perspective. *Journal of MIS, 14*(4), 87–111.

Hofstede, G. (2001). *Culture's consequences: comparing values, behaviors, institutions, and organizations across nations*. New York: Holden Press.

Hofstede, G., & Bond, M. H. (1988). The confucian connection: from cultural roots to economic growth. *Organizational Dynamics, 16*(4), 4–21.

King, J. L. & Lyytinen, K. (2003). Call for papers: Standard making: A critical research frontier for information systems, *MIS Quarterly*, *27*, i-iv.

King, J. L. and Lyytinen, K. (2006) Standard making: A critical research frontier for IS research. *MIS Quarterly*, *30*, 405–411.

Lee, A. S. (1989). A scientific methodology for MIS case studies. *MIS Quarterly, 13*, 33–57.

Lee, H., & Oh, S. (2006). A standards war waged by a developing country: Understanding international standard setting from actor-network perspective. *Journal of Strategic Information Systems, 15*, 177–195.

Lyytinen, K., & Fomin, V. (2002). Achieving high momentum in the evolution of wireless infrastructures: The battle over 1G solutions. *Telecommunications Policy, 26*, 149–170.

Lyytinen, K., & King, J. (2002). Around the cradle of the wireless revolution: The emergence and evolution of cellular telephony. *Telecommunications Policy, 26*, 97–100.

Malone, T., Yates, J., & Benjamin, R. (1987). Electronic markets and electronic hierarchies: Effects of IT on market structure and corporate strategies. *Communications of the ACM, 30*, 484–497.

Markus, M. L., Steinfield, C. W., Wigand, R. T., & Minton, G. (2006). Industry-wide IS standardization as collective action: The case of the US residential mortgage industry. *MIS Quarterly, 30*, 439–465.

McNaughton, B., Ray, P., & Lewis, L. (2010). Designing an evaluation framework for IT service management. *Information & Management, 47*, 219–222.

Montealegre, R. (1999). A temporal model of institutional interventions for information technology adoption in less-developed countries. *Journal of MIS, 16*(1), 207–232.

Myers, M. D. (1999). Investigating information systems with ethnographic research. *Communications of the AIS*, *2*(4).

Nandhakumar, J., & Jones, M. (1997). Too close for comfort? distance and engagement in interpretive information systems research. *Information Systems Journal, 7*(2), 109–131.

Parasuraman, L. L., Berry, L. L., & Zeithamel, V. (1991). Refinement and reassessment of the ServQUAL scale. *Journal of Retailing, 67*(4), 420–450.

Steinfield, C. W., Markus, M. L., & Wigand, R. T. (2005). Exploring interorganizational systems at the industry level of analysis: evidence from the US home mortgage industry. *Journal of Information Technology*, *20*(4), 224–233.

Van Maanen, J. (1979). Reclaiming qualitative methods for organizational research. *Administrative Science Quarterly, 18*, 520–535.

Van Maanen, J. (1988). *Tales of the field: on writing ethnography*. Chicago: University of Chicago.

Webster, J. (1995). Networks of collaboration or conflict? Electronic data interchange and power in the supply chain. *Journal of Strategic Information Systems*, *4*(1), 31–42.

Weitzel, T., Beimborn, D., & König, W. (2006). A unified economic model of standard diffusion: the impact of standardization cost, network effects, and network topology. *MIS Quarterly*, *30*, 489–514.

Wigand, R., Steinfield, C. W., & Markus, M. L. (2005). IT standards choices and industry structure outcomes: The case of the US home mortgage industry. *Journal of MIS, 22*, 165–191.

Yoo, Y., Lyytinen, K., & Yang, H. (2005). The role of standards in innovation and diffusion of broadband mobile services: The case of South Korea. *Journal of Strategic Information Systems, 14*(3), 323–353.

Zhu, K., Kraemer, K. L., Gurbaxani, V., & Xu, S. X. (2006). Migration to open-standard interorganizational systems: network effects, switching costs, and path dependency. *MIS Quarterly*, *30*, 515–539.

Moving up the Global Value Chain: The Case of Chinese IT Service Firms

Ning Su

Abstract In recent years, Chinese IT service suppliers have been actively expanding their business in three major markets: Japan, the United States, and the Chinese domestic market. This qualitative case study of thirteen major Chinese IT service firms conceptualizes the internationalization behavior and decision rationale of these suppliers. The findings show that some of these suppliers followed an incremental internationalization strategy, while others were "born global." Both types of firms' entry and growth in different markets consisted of the combination of a strategically-planned resource-seeking process and a highly flexible, opportunistic "bricolage" process. By dynamically oscillating between different strategy processes, these suppliers were able to rapidly grow in multiple markets and gradually move up the global value chain.

Keywords Global outsourcing · IT supplier · Decision process · Internationalization · China

1 Introduction

China has grown into a major destination for global IT service outsourcing (KPMG 2010). By 2011, the country's software industry had reached over 200 billion USD (China Ministry of Commerce 2011). On the other hand, the industry has been domestically-oriented, with only about 5 % of revenue coming from export (China Ministry of Commerce 2011), compared to 80 % in India (Nasscom 2010).

An earlier extended version appeared as Su, N. "Internationalization Strategies of Chinese IT Service Suppliers," MIS Quarterly (37:1), 2013, pp. 175–200.

N. Su (✉)
Ivey Business School, Western University, 1255 Western Road, London, ON N6G 0N1, Canada
e-mail: nsu@ivey.ca

R. Hirschheim et al. (eds.), *Information Systems Outsourcing*, Progress in IS,
DOI 10.1007/978-3-662-43820-6_15

In recent years, the software and IT service industry has been viewed by China as a key to the country's strategic transformation from a manufacturing-oriented economy to a service-driven economy, an initiative called "From 'Made in China' to 'China Service'" by the Chinese media (Rottman and Hao 2008), and the government had launched policies that incentivized rapid growth of the software and IT service industry.

Compared to established multinational suppliers and Indian suppliers, Chinese IT service firms are still at a relatively early but rapidly growing stage in their development. On the other hand, some Chinese suppliers have developed unique capabilities and even achieved worldwide leadership in certain niches such as offshore research and development outsourcing (IAOP 2010b). Some suppliers have been providing IT services to large Japanese firms for over two decades (Carmel et al. 2008), and China is Japan's largest offshore software and IT service outsourcing destination (Xinhua 2007). In recent years, especially after the 2008 global financial crisis, many major suppliers shifted their international growth from Japan to Western markets, especially the United States (China Business News 2007), while seeking to increase market share in the dynamic domestic market, where new business opportunities continuously emerge. In all three markets, how to move up the value chain is a major question facing these suppliers.

In order to understand how Chinese IT service suppliers expand their business in multiple markets, this study uses interview-based qualitative case study of thirteen major China-based IT service firms. These firms encompass almost all of the most globally-recognized Chinese IT service suppliers, according to rankings by major global and Chinese industry associations (e.g., IAOP 2008, 2009, 2010a, 2010b, 2011; Chinasourcing 2008). Based on in-depth interviews with the firms' top and middle-level managers and supplementary archival data, and drawing on the international business (IB) and information systems (IS) literatures, the study elaborates these suppliers' internationalization and growth processes as they move up the global value chain.

2 Literature Review

This section reviews the theoretical foundation of the study. Specifically, the section first reviews related research on internationalization in the IB literature, and then summarizes the IS literature on IT outsourcing, especially the research from the supplier's perspective.

2.1 International Business

The IB literature defines suppliers' provisioning of services to clients from international markets as a process of "internationalization" (Andersen 1993; Calof

and Beamish 1995). Over the last four decades, a body of research has focused on characterizing firms' internationalization behavior. In particular, two sets of descriptive models have emerged as the most widely adopted frameworks, the Uppsala models (U-M) and innovation-related models (I-M) (Andersen 1993). U-M view internationalization as a process driven by firms' gradual accumulation of market knowledge (Johanson and Wiedersheim-Paul 1975; Johanson and Vahlne 1977, 1990). I-M view internationalization as a process of innovation diffusion within the firm (Bilkey and Tesar 1977; Cavusgil 1980; Reid 1981). Both models suggest that internationalization is an incremental process, as firms successively enter markets with increasing "psychic distance", i.e., difference in language, culture, education, politics, business practice (Johanson and Vahlne 1977, 2009).

The above models and their underlying theories have provided the IB literature with a set of conceptual frameworks for describing and explaining firms' internationalization strategy. The types of firms that the IB literature has traditionally examined are mostly established, large multinationals (Oviatt and McDougall 2005). More recent development in the global economy, however, has presented both challenges and opportunities to traditional theories. Specifically, certain highly entrepreneurial firms are able to internationalize more rapidly than the prediction of traditional models (e.g., Lu and Beamish 2001). In particular, certain new ventures, such as some technology-based, knowledge-intensive firms, may enter foreign markets right from the firms' inception or shortly thereafter. These firms are termed "born-globals" (Rennie 1993; Oviatt and McDougall 1994, 1997; Moen and Servais 2002; Knight and Cavusgil 1996, 2004). Examination of born-globals involves an integration of ideas from both IB and entrepreneurship (e.g., Shane and Venkataraman 2000), eventually leading to the emergence of a dynamic field, international entrepreneurship (Dana et al. 1999; McDougall and Oviatt 2000; Acs et al. 2003).

Among international new ventures, software and IT service firms are a prominent case (Prashantham 2005). IT's ability to facilitate cross-border coordination (Rangan and Sengul 2009) and to enable product and service delivery in electronic forms (Ojala and Tyrvainen 2006) provides firms with opportunities to increasingly engage in international business (Sinkovics and Bell 2006; Etemad et al. 2010). Software and IT service firms are also unique in the knowledge-intensive nature of their business (Autio et al. 2000; Saarenketo et al. 2004). Their focus on acquiring various types of knowledge resources, including market information, entrepreneurial capacities, and business networks (Mejri and Umemoto 2010) enables these firms to rapidly and successfully internationalize into foreign markets (Dib et al. 2010; Kuivalainen et al. 2010).

Another type of firms that pose challenges to traditional internationalization theories are emerging market based firms (Hoskisson et al. 2000; Wright et al. 2005). Some of these firms are actively expanding into developed economies (e.g., Makino et al. 2002; Yamakawa et al. 2008). In contrast with traditional multinational corporations, which often enter foreign markets to exploit their existing firm-specific knowledge and capabilities, firms from emerging market oftentimes internationalize into developed economies in order to address their competitive

disadvantages (Child and Rodrigues 2005). By proactively acquiring strategic assets overseas (e.g., Deng 2009) and rapidly upgrading capabilities (e.g., Guillén and García-Canal 2009), some emerging market based firms are becoming new multinationals themselves (ibid). These firms' internationalization is a highly entrepreneurial process that involves continuous creation of new business opportunities (Yiu et al. 2007; Schweizer et al. 2010).

As the world's largest emerging market, China has been undergoing three decades of reform toward a market economy; in this transformation, Chinese firms become increasingly mature and capable (Guthrie 2001, 2005). In the past decade in particular, a growing number of Chinese firms are internationalizing into developed economies and some are growing into highly innovative and competitive players in the global market (Luo and Tung 2007). Similar to other emerging market based firms, Chinese firms pursue internationalization in order to seek strategic assets to compensate for their competitive weaknesses (ibid; Naude and Rossouw 2010). What is unique about China is that Chinese firms have been especially active in adopting the role of subcontractors for foreign firms (Murray et al. 2005; Child and Rodrigues 2005). Such partnerships can provide Chinese firms with a more direct channel for acquiring managerial and technical competency (ibid; Liu et al. 2009), becoming more competitive and innovative, and eventually moving up the global value chain (Abbott et al. 2012, 2013).

To understand the behavior and decision rationale of these new ventures, the international entrepreneurship literature has adopted a set of theories similar to those in traditional IB research, including TCE (e.g., Schwens and Kabst 2009) and RBV (e.g., Gray and McNaughton 2010). Here RBV is broadly defined to include knowledge-based view and organizational learning theory. Network theory (e.g., Oviatt and McDougall 2005) and institutional theory (e.g., Peng et al. 2008) are also extensively used. Network as a form of social capital (Yli-Renko et al. 2002) can be viewed as a resource (Zahra et al. 2003) and integrated into RBV (e.g., Coviello and Cox 2006; Torkkeli et al. 2012). Overall, RBV is the most extensively-adopted framework for studying international entrepreneurship (Acs et al. 2003; Kiss et al. 2012).

RBV has also provided a theoretical foundation for entrepreneurship research in general (e.g., Helfat and Lieberman 2002; Autio et al. 2011). The ownership and control of valuable resources is critical to the founding and growth of entrepreneurial firms (Lee et al. 2001; Davidsson and Honig 2003). Many nascent firms, however, face severe resource constraints. In response, firms may seek and acquire resources from their external business environments (e.g., George and Prabhu 2000). Alternatively, firms may engage in a process of "bricolage", that is, "making do by applying combinations of the resources at hand to new problems and opportunities" (Baker and Nelson 2005, pp. 333). The notion of bricolage, adapted from Lévi-Strauss' (1967) anthropology research, refers to a process in which actors recombine various available physical, social, or institutional elements, such as technical artifacts (Lanzara 1999), organizational routines (Ciborra 1996), and social network (Baker et al. 2003), to achieve their goals. Bricolage emphasizes actors' "resourcefulness" and adaptability within an existing context

(Di Domenico et al. 2010), and highlights the emergent and oftentimes improvised aspect of strategic decision-making (Weick 1998; Moorman and Miner 1998; Crossan et al. 2005).

2.2 IT Service Suppliers

A prominent example of international entrepreneurship is the recent rise of offshore IT service suppliers. IT services as an industry has been extensively studied in the IS literature. In the last two decades, a rich set of studies have explored a number of key questions that firms need to consider when transferring IT services to another firm or another country. According to two major surveys (Dibbern et al. 2004; Lacity et al. 2010), these questions can be categorized into four general topics: why firms outsource (e.g., Loh and Venkatraman 1992; Kishore et al. 2004), what firms outsource (e.g., Cross 1995; Cullen et al. 2005), how firms make outsourcing decisions (e.g., Hirschheim and Lacity 2000; Koh et al. 2004), and how firms implement and manage outsourcing arrangements (e.g., Tiwana and Keil 2007; Goo et al. 2009). In recent years, several trends have dramatically shaped the global IT outsourcing landscape. These trends include: first, the emergence of innovative sourcing models such as multisourcing (e.g., Su and Levina 2011; Bapna et al. 2010), shared services (e.g., Janssen and Joha 2008; Su et al. 2009), and cloud computing (e.g., Armbrust et al. 2010; Su 2011); second, the maturation of alterative global outsourcing destinations outside of India (e.g., Oshri et al. 2009).

While most existing research on IT outsourcing adopts the perspective of the client, a growing number of studies explore outsourcing from the supplier's standpoint. The focus of these studies is on how suppliers can successfully deliver the outsourced services and create value for their clients. The findings suggest that the economies of scale and scope resulting from the suppliers' experience with a multitude and variety of clients enable the suppliers to develop a set of complementary organizational capabilities (Levina and Ross 2003; Jarvenpaa and Mao 2008). These capabilities encompass knowledge and skills that are specific to individual clients, and generic management ability that can be applied across different clients (Ethiraj et al. 2005).

Offshore outsourcing, as a unique form of international venturing, brings opportunities and challenges to both clients and suppliers (e.g., Carmel and Agarwal 2002; Gopal et al. 2003; Ang and Inkpen 2008). The national and cultural boundaries between the client and the supplier, unless proactively managed, can be detrimental to effective collaboration between the two parties (Levina and Vaast 2008). In order to alleviate such boundaries, the supplier needs to develop a trusting inter-organizational relationship with clients (Kaiser and Hawk 2004). The supplier also needs to adopt a suitable contract structure. For example, if the offshore supplier does not yet possess mature capabilities and sufficient scale for undertaking large, complex outsourcing engagements, the supplier can leverage

the "mediated" sourcing model (e.g., Jarvenpaa and Mao 2008). Most existing research on the suppliers' perspective focuses on suppliers' practices for addressing national and cultural boundaries after the suppliers have already entered international markets. The question of how suppliers actually enter and expand in different markets in the first place, however, has not been investigated.

Another characteristic of the existing research on offshore supplier's perspective is the focus on Indian firms (Lacity et al. 2010). Chinese suppliers are very different from Indian firms (e.g., Qu and Brocklehurst 2003; Rottman and Hao 2008; Levina et al. 2011), and are becoming increasingly important in today's global IT outsourcing industry (KPMG 2010). Leading Chinese suppliers have accumulated significant capabilities (e.g., Du and Pan 2010). For example, on International Association of Outsourcing Professional (IAOP)'s 2010 global supplier ranking, six out of the ten leading suppliers in the area of research and development (R&D) service outsourcing are Chinese IT service suppliers (IAOP 2010a). Despite their rapid emergence, Chinese suppliers have been understudied in the IS literature (Lacity et al. 2010).

2.3 Summary

Chinese IT service suppliers represent an intersection of two types of understudied firms: knowledge-intensive new ventures and emerging market based firms. In addition, China itself is an understudied location in the global IT outsourcing industry. Chinese IT service suppliers are in a relatively early stage in their internationalization, but are rapidly expanding into developed markets in a highly entrepreneurial fashion. The existing IS literature, although having offered a rich depiction of IT service suppliers, has not examined how such "new multinational" suppliers internationalize and make strategic decisions regarding their internationalization. The related IB research has provided valuable theoretical frameworks for describing and explaining firms' internationalization behavior, but has not adequately elaborated the processes surrounding the formation and evolution of these firms (Mathews and Zander 2007). More in-depth research, especially qualitative, case-based research (Piekkari and Welch 2006; Nummela and Welch 2007), is needed to develop a realistic and holistic conceptualization of Chinese suppliers' internationalization and the underlying decision-making process (Rialp-Criado et al. 2010).

3 Research Methods

Since this research focuses on answering "how" and exploratory "what" questions regarding a phenomenon that is embedded in organizational practices and grounded in real-life situations, the case study methodology was selected

(Benbasat et al. 1987; Eisenhardt 1989; Pettigrew 1990; Yin 2003; Dubé and Paré 2003; Siggelkow 2007). In order to both provide a fine-grained view of the evolution of strategy processes (Melin 1992; Van de Ven and Poole 1995) within the supplier, and replicate this study at multiple sites, the interview-based study seeks to synergistically combine retrospective studies of twelve suppliers with an in-depth, longitudinal study of a single supplier (Leonard-Barton 1990).

To provide a relatively complete view of the upper tier of China's offshore IT service industry, thirteen major China-based IT service firms (Suppliers A to M) were selected. The thirteen firms included almost all of the most globally-recognized Chinese suppliers and several other most domestically reputable suppliers (e.g., IAOP 2008, 2009, 2010b, 2011; Chinasourcing 2008). These firms had varied sizes and backgrounds, and were headquartered in seven service outsourcing "hub cities" designated by the Ministry of Commerce of China. The seven cities covered all three major geographical drivers of China's IT service industry: North, Northeast, and East China. Table 1 provides an overview of the background of the thirteen suppliers.

Data collection was conducted between 2006 and 2011. Altogether, 95 interviews were administered with top and middle-level managers of the thirteen suppliers. 60 of the interviews were conducted at Supplier A. Each interview lasted between 45 min and 3 h, with the average length of approximately 1.5 h. The interviews were semi-structured, allowing for collection of both factual information, such as major events in the firms' history, and narrative data. The author mostly asked open-ended questions to let the informants describe and explain stories related to the firm's internationalization. An interview guide was used to ensure the completeness of the data. The interview guide had two versions. One version was for senior-level managers who had been involved in the firm's overall strategic decision-making. This version had four main sections, including the supplier's major markets, the supplier's internationalization process, the rationale behind the supplier's entry and expansion in different markets, and the supplier's future plans. The other version was for middle-level managers, and had an additional section on how the supplier's overall internationalization decisions were implemented within, and influenced by, the informant's business unit.

Inductive techniques were applied to analyze the qualitative data from multiple cases (Eisenhardt 1989; Miles and Huberman 1994; Strauss and Corbin 1997; Bansal and Corley 2011). 85 of the 95 interviews were conducted in Chinese, 9 in English, and 1 in Japanese through an interpreter. The interviews were transcribed and then translated into English by the author, who was bilingual in English and Chinese. Data analysis followed the four-level approach suggested by Pettigrew (1990). First, for each supplier, the interview transcripts and secondary data were triangulated and synthesized into an "analytical chronology" (ibid), which described the supplier's history, background, and growth strategies for different markets. Second, each analytical chronology was abstracted and restructured into a "diagnostic case" (ibid) that focused on addressing the paper's key theme: how

Table 1 Supplier background

Firm	Founding[a]	Headquarters	Number of employees	Background
Supplier A	Early 1990s	Northeast China	>10,000	Strong brand in Japan; strong relationships with diverse clients from China, Japan, and U.S.
Supplier B	Mid 1990s	North China	>10,000	Focusing on the U.S. market; strong relationships with diverse clients from China, Japan, and U.S.
Supplier C	Early 2000s	North China	>10,000	Strong relationships with diverse clients from China, Japan, and U.S.
Supplier D	Mid 1990s	East China	5,000–10,000	Strong relationships with diverse Chinese clients and a focused set of clients from Japan and U.S.
Supplier E	Mid 1990s	Northeast China	5,000–10,000	Strong relationships with, and balanced revenues from, both Japan and U.S.
Supplier F	Early 2000s	North China	5,000–10,000	Strong relationships with diverse clients from China, Japan, and U.S.
Supplier G	Mid 1990s	North China	2,000–5,000	Focusing on the U.S. market; main business directly transferred from the U.S.
Supplier H	Mid 1990s	Northeast China	2,000–5,000	Focusing on diverse Japanese and Chinese clients, with some projects from a small set of U.S. firms
Supplier I	Mid 1990s	North China	2,000–5,000	Focusing on the domestic market; strong market position in China; expanding rapidly into the U.S.
Supplier J	Mid 1990s	East China	2,000–5,000	Strong relationships with diverse Chinese clients and a focused set of clients from Japan and U.S.
Supplier K	Early 2000s	Southwest China	500–1,000	Solid business relationships with a focused set of clients from China, Japan, and U.S.
Supplier L	Mid 1990s	East China	500–1,000	Solid business relationships with a focused set of clients from China, Japan, and U.S.
Supplier M	Early 2000s	East China	500–1,000	Focusing on the U.S. market; strong reputation and brand in the U.S., with a diverse set of clients

[a] Early 1990s: 1990–1993; Mid 1990s: 1994–1996; Late 1990s: 1997–1999. Same for the 2000s

does the supplier enter and expand in different markets? Third, the diagnostic case was further inductively analyzed. The themes that emerged during the analysis were linked to the broader literature on international business and IT outsourcing to generate a "theoretical case" (ibid) that included preliminary findings. Finally, cross-case analysis was conducted to compare themes and concepts from multiple cases, and to refine the theoretical findings. The four levels of analysis were overlapping in terms of timing. Data analysis also iterated with data collection. The 60 interviews with Supplier A were conducted throughout the entire time span of this research project. Most theoretical insights initially emerged from Supplier A. Suppliers B to M were mostly used as literal replication to confirm findings from Supplier A. Discrepancies between Suppler A and the other suppliers were explored through additional, increasingly fine-grained interviews that assisted to revise and refine findings. Multiple iterations of the four levels of analysis were conducted to incrementally develop the findings, until theoretical models that fit most cases were derived (Yin 2003). The following sections elaborate findings on the suppliers' internationalization behavior and rationale.

4 Suppliers' Internationalization Process

When describing the characteristics of their clients, all suppliers grouped their clients into three major markets: Japan, and to a lesser extent, other Asian countries and regions; U.S., and to a lesser extent, Western Europe; and the Chinese domestic market. The main reason for this categorization was that client firms from these markets adopted significantly different approaches for managing outsourcing relationships with Chinese IT service suppliers, while clients from the same market exhibited significant commonality in their outsourcing approaches.

4.1 Japan

Japanese firms had a long history of outsourcing IT-related work to China. The first IT project contracted by a foreign client to a Chinese organization was from a Japanese firm in the late 1980s. Since then, many Japanese firms started to outsource to China. A significant amount of work from Japanese firms was outsourced through the "mediated offshore development model" (Jarvenpaa and Mao 2008). According to the interviews, Japanese clients tended to assign Chinese suppliers a passive role in the IT value chain and outsource lower-end, modularized tasks to Chinese suppliers. On the other hand, Japanese firms attached great importance to establishing long-term, trusting relationship with their suppliers. Some Japanese clients actively helped their suppliers build up capabilities.

> Japanese clients are not eager for quick success and instant benefit. They give you a strategic plan, helping you develop your competencies. It is more like a marriage relationship. Once they recognize you, they will not easily choose others. … They will not solicit bids for everything… They think of this as a symbiotic relationship. [Senior VP of Supplier A]

4.2 U.S.

The U.S. market was a new focus of China's offshore IT service industry. Major Chinese suppliers were actively expanding their business in the U.S. market. Compared to Japanese firms, U.S. firms were more likely to directly outsource to Chinese suppliers. The scope of the outsourced work was very broad, including both lower-end coding and testing, and higher-end system design and even product innovation. In contrast to Japanese firms, U.S. clients tended to expect Chinese suppliers to assume a more active role in outsourcing by autonomously and independently proposing solutions to address clients' business requirement. Their relationship with the suppliers was largely based on the suppliers' immediate performance.

> (U.S clients) have a basic idea and then will let you do it. In this process, you have to discover the potential issues or add more stuff to it. You have to propose your own ideas to the client. You have to point out what those ideas lead to. You should proactively initiate this kind of discussion. In Japanese projects, this way of working is not very likely to happen, or even not allowed to happen. [Senior VP of Supplier A]

4.3 China

China's vast and dynamic domestic market was a driving force behind the country's IT service industry. During China's three decades' economic reform toward a market economy, Chinese domestic firms had undergone major transformation, and IT had become a key success factor for many Chinese firms (e.g., Zhang et al. 2008). Domestic firms and public organizations had been outsourcing IT-related work to Chinese suppliers for over two decades. The outsourced work ranged broadly from basic coding and testing to high value-added activities such as IT consulting and product research and development.

In China's emerging economy, many firms were building large-scale, complex systems from scratch, and many clients, lacking mature IT capabilities in-house, tended to outsource a holistic portfolio of services including consulting, business analysis, system design, development, testing, support, and maintenance. Domestic clients also tended to issue high-level requirements and focused on the end products without caring about the actual software development process.

Table 2 Suppliers' market entry sequence

	China	Japan	U.S.
Supplier A	2nd	1st	3rd
Supplier B	2nd	3rd	1st
Supplier C	1st	2nd	3rd
Supplier D	1st	3rd	2nd
Supplier E	1st	2nd	3rd
Supplier F	2nd	3rd	1st
Supplier G	2nd	3rd	1st
Supplier H	2nd	1st	3rd
Supplier I	1st	NA	2nd
Supplier J	1st	2nd	3rd
Supplier K	3rd	2nd	1st
Supplier L	2nd	1st	3rd
Vendor M	1st	NA	2nd

> Generally speaking, in domestic projects, the client points to a direction, and our developers have to start walking. In international projects, before you ask me to walk, you must tell me, which leg to move first, how far each step is, how many steps I should walk, or what kind of shoes I should wear. [Project Director of Supplier A]

Facing opportunities from the world' three largest economies: U.S., China, and Japan, the suppliers had exhibited different patterns during their entry and expansion in these markets. Table 2 describes the supplier's market entry sequence. These internationalization processes can be categorized into two types: "incremental internationalization" and "born global".

4.4 Incremental Internationalization

The first type of suppliers followed the traditional, incremental internationalization process model which suggests that firms gradually enter increasingly "psychically-distant" countries (e.g., Johanson and Vahlne 1977). Suppliers C, E, I, J, and M followed this model. These firms initially only focused on the domestic market, and then expanded into the Japanese market, as well as other Asian markets in some cases. Finally, these suppliers internationalized into the U.S. market and in some cases, Western European markets.

Specifically, Suppliers C and E were founded as domestically-oriented IT service firms, but with plans of expanding into international markets. After accumulating technical and managerial experience in the domestic market, these firms entered the Japanese and subsequently the U.S. markets. Supplier M had a similar background, except that the firm later completely exited from the domestic market and focused exclusively on the U.S. market. Suppliers I and J were respectively founded as a traditional, domestic system integration firm and a

software product firm. As IT outsourcing as an industry started to emerge and expand in China, these firms transformed themselves into IT service firms and started to enter international markets.

4.5 Born Global

The second type of firms was consistent with the characteristics of "born globals". Born globals seek to derive significant advantages from sales to foreign markets right from or shortly after the firms' birth (e.g., Oviatt and McDougall 1994). Suppliers A, B, F, G, H, K, and L started their business by providing services to international clients. Supplier D also started working with a major U.S. client shortly after the supplier's foundation. All these suppliers later also diversified inward into the domestic market and started providing services to Chinese firms.

Specifically, Supplier A was founded based on a collaborative initiative between a Chinese university and Japanese firm. The Japanese firm also became the supplier's first client. The experience gained through working with its first Japanese client helped the supplier to later expand into the domestic market and rapidly grow the firm. After achieving leadership positions in both Japanese and domestic markets, Supplier A expanded into the U.S. market. Supplier L, also founded by a Chinese university and a Japanese firm, followed a similar path. The firm obtained its initial projects from the Japanese firm, and later successfully applied the knowledge acquired in the Japanese market to the Chinese domestic market. Supplier H had been consistently focusing on the Japanese market since its foundation, while occasionally undertaking work from domestic and Western clients.

Suppliers B, D, F, G and K had a strong focus on the U.S. market. Supplier B was founded as a R&D laboratory for a large U.S.-based multinational software and IT service firm, and focused on growing its business with U.S. multinationals. Supplier D's initial clients were from the Chinese domestic market, but the supplier soon established business relationship with a large U.S.-based client and expanded into the U.S. market. Supplier F was created as an offshore development center for its founders' U.S.-based software firm. Supplier F's other early clients were also from the U.S. Supplier G obtained its first contracts from a U.S.-based multinational's Chinese subsidiary and then gradually transitioned to obtaining projects directly from the U.S. market. Supplier K was founded as a Western-oriented IT service firm, with its first contract brought to China from North America by the firm's founder. All these suppliers later also diversified into the Japanese and domestic markets.

5 Suppliers' Decision-Making Process

A supplier's internationalization process is the outcome of the firm's strategic decision-making process. The data analysis has identified three key factors that shaped the supplier's decisions regarding its entry and expansion in different

markets. These factors are: the supplier's internationalization strategy, operation capability, and client relationship. Internationalization strategy refers to the supplier's intentional choice of timing and approaches for entering different markets. Country, industry, and the type of service offering were the key elements of such strategic selection. Operation capability refers to the supplier's ability to complete the outsourced tasks for the clients. Technical capability, including system analysis, design, and programming skills; process capability, such as the implementation of standardized process models; and client-specific capability, especially the ability to understand clients' requirements and engage the clients to achieve satisfactory outcomes, were the key elements of operation capability. Client relationship refers to the set of contractual arrangements between the supplier and its clients. Relationship is characterized by breadth, that is, the scope of the contracted service; depth, that is, the level of mutual commitment between the two parties; and the type of client in the relationship.

It is worth noting that a supplier's operation capability and client relationship can both be conceptualized as valuable resources and knowledge (Zahra et al. 2003; Coviello and Cox 2006; Mejri and Umemoto 2010). As the most widely adopted theoretical framework in international entrepreneurship research (e.g., Acs et al. 2003; Young et al. 2003), RBV provides the common theoretical framework for explaining both traditional, incremental models of internationalization and born globals (e.g., Gray and McNaughton 2010). Compared to other theories, RBV highlights the dynamic, longitudinal process by which firms leverage and develop capabilities as they enter multiple markets (Madhok 1997; Peng 2001), making it most suitable for this study.

During the supplier's entry and expansion in different markets, the three decision factors continuously interacted with one another to shape the supplier's decision-making. Based on RBV, and in particular the concept of resource bricolage in entrepreneurship research (e.g., Baker and Nelson 2005), three decision-making processes were identified: a resource seeking process directed by the supplier's explicit internationalization strategy; a resource bricolage process driven by the supplier's current operation capability; and a resource bricolage process based on the supplier's existing client relationship. Over time, these decision-making processes switched from one to another, resulting in a dynamic oscillation between different processes.

5.1 Strategic Resource-Seeking

In this process, the supplier's entry and expansion in different markets is driven by an explicitly defined internationalization strategy. In other words, the decision is based on the question "Where do I want to go?" Under the direction of the internationalization strategy, the supplier has a systematic, strategic plan for internationalization, but may not possess adequate resources, including relationships with

desired clients or capabilities for servicing these clients. In response, the supplier actively engages in resource-seeking activities.

Specifically, two processes take place. First, the internationalization strategy shapes the firm's selection of client relationships. Second, the resulting client relationships, in turn, facilitate the development of operation capabilities. For example, in the early 2000s, Supplier A set the goal of becoming a top Chinese IT service supplier for U.S. firms. To achieve this goal, the firm decided to focus on cultivating deep relationships with large U.S. clients with significant business interest in China. It focused on pursuing service contracts with "continuity", that is, services that embedded future business opportunities. These strategically selected clients and contracts, in turn, enabled the supplier to significantly improve its operation capabilities.

> For the U.S. market we mainly establish relationships with large clients… because large clients have strong capabilities. In the process of interacting with these clients, we can gradually improve our technical competencies… as well as management skills. [International Business Development Manager of Supplier A]

The alternative scenario may also occur. Specifically, under the direction of a defined internationalization strategy, the supplier first seeks to acquire operation capabilities through hiring, training, or internal knowledge transfer. The improved operation capabilities then enable the supplier to strategically expand its client relationships. For example, when Supplier A was pursuing the goal of becoming a market leader in the Western market, the supplier lacked prior experience in one of the key industries, which made it difficult for the suppler to obtain major Western clients. In response, Supplier A first accumulated experience in this industry by working with Chinese domestic clients. Leveraging these capabilities, Supplier A later successfully established a strategic relationship with a U.S.-based Fortune Global 500 firm.

5.2 Capability-Based Bricolage

In this process, the supplier's growth in multiple markets is driven by its existing operation capabilities. In other words, the decision is based on the question: "What can I do?" In this process, the supplier often already possesses significant capabilities, but has not yet defined a systematic, strategic approach toward internationalization. When potential opportunities emerge, however, the supplier combines and leverages its existing capability elements, and entrepreneurially expands its business in new markets. Drawing on the notion of entrepreneurial bricolage (Baker and Nelson 2005), this opportunistic, flexible process of "making do" with existing capabilities can be defined as "capability-based bricolage".

Specifically, two processes take place. First, the firm leverages its capabilities and develops a set of client relationships to fully utilize these capabilities. Second, as the firm works with the selected clients, a systematic internationalization

strategy emerges. For example, in the early stages of Supplier C, the firm primarily focused on Asia-based clients and only undertook sporadic, small-sized U.S. projects when the supplier had extra capacity, but as Supplier C accumulated more experience in these projects, it sought to become a major player in the U.S. market and eventually pursued more aggressive, strategic expansion.

> When it came to the Western market, we basically 'stood by a tree stump, waiting for a hare' ('shou zhu dai tu', Chinese proverb, implying a passive way of doing things in this context). People came to our doorsteps and we just reacted … In the next step we will be more proactively expanding in the market. [Senior VP of Supplier C]

The alternative scenario may also occur. Specifically, based on its existing operation capabilities, the supplier first defines an internationalization strategy. Directed by this strategy, the supplier then expands its client relationships. For example, Supplier B had been conducting small-scale R&D projects for a large U.S.-based software and IT service company. After years of experience accumulation, the supplier realized its potential in the broader global IT outsourcing market, and defined a systematic internationalization strategy. Based on this strategy, Supplier B developed relationships with a number of large U.S. clients, and rapidly grew its business.

> When we were founded in [the mid 1990s], we didn't realize outsourcing was an industry, but what we were doing was exactly outsourcing… In 2003… we started to look at the industry value chain. When we saw this value chain, we looked for our entry point. We decided to enter from the middle, not too high, not too low, and then expand toward the two ends. [Founder and CEO of Supplier B]

5.3 Relationship-Based Bricolage

In this process, the supplier's internationalization is driven by its existing client relationship. In other words, the decision is based on the question "Who am I working with?" In this process, the supplier may not possess sufficient operation capabilities or systematic internationalization strategies, but has established relationship with clients that are willing to further collaborate with the supplier. The supplier can leverage such relationship at hand as a springboard, and either expands its business into other subsidiaries or other business lines of the same client, or obtains work from other client firms with similar requirement. This process of "making do" with existing ties with clients can be defined as "relationship-based bricolage".

Specifically, two sub-processes occur. First, the supplier develops operation capability through interacting with firms in its existing client portfolio. Second, the improved operation capability leads to the formation of an explicit internationalization strategy. For example, Supplier G initially focused on working for the Chinese subsidiary of a U.S.-based Fortune Global 100 firm. As the supplier strengthened its operation capabilities through this relationship, it sought to

become a leader in the U.S. market, and started to pursue more complex projects directly outsourced from the U.S. subsidiaries of this client and other new clients.

> In the 90s, when MNCs such as Microsoft and IBM aggressively grew their business in China, they would send out some requirements. Our company at the beginning got some requirements from [a U.S.-based Fortune Global 100 IT company], some software localization related projects. We used this as an opportunity to grow our company, and later we started to focus on offshore software outsourcing… Today, most of our business is directly from the U.S. [VP of Supplier G]

The alternative scenario may also occur. Specifically, based on existing client relationships, the supplier first defines an internationalization strategy; based on the strategy, the supplier improves its operation capability accordingly. For example, initially, Supplier J only focused on domestic and Japanese markets. However, after the firm successfully provided some work to a U.S. firm, it decided to significantly increasing the business from the U.S., and planned a stepwise approach for leveraging its relationship with this client to expand its U.S. business. To achieve this goal, the supplier started systematically building its capabilities for the U.S. market.

5.4 Dynamic Oscillation in Decision-Making

The above three processes may coexist in a firm's decision-making process, but the degree to which each process takes place changes over time. For example, Supplier A's initial entry and expansion in the Japanese market was a process of bricolage based on its relationship with its first Japanese client; in this phase, the supplier was still in its infancy and did not possess mature operation capability, but the Japanese client invested time and resources in the supplier. Such investment facilitated the supplier's growth in the Japanese market. As Supplier A acquired capabilities and built up its brand name in Japan, other Japanese firms that had an interest in outsourcing to China started to approach the supplier. This phase of the supplier's growth was a process of capability-based bricolage, as the supplier leveraged its existing capability as a platform to expand client relationships. As the supplier gradually emerged as a leader among Chinese IT service suppliers, it began to systematically define its strategy for the Japanese market, starting to focus on certain types of clients and certain types of projects that the supplier viewed as strategic to the firm's long-term growth. In this phase, the firm's growth was a strategic, resource-seeking process. To summarize, during its entry and expansion in the Japanese market, Supplier A switched between different strategy processes. This switching behavior is termed "dynamic oscillation" (e.g., Thomas et al. 2005; Levina and Su 2008).

This dynamic oscillation in internationalization decision-making was found in every other supplier too. Table 3 summarizes the thirteen firms' internationalization decision-making processes. The table only highlights the dominant process at the early stage the firm and the dominant process of today. For example, in the

Table 3 Dynamic oscillation in supplier internationalization decision-making

	Internationalization process	Initial market	Japan			U.S.			China		
			Initial	Current	Oscillate	Initial	Current	Oscillate	Initial	Current	Oscillate
Supplier A	Born-global	Japan	R	S	x	C	S	x	C	S	x
Supplier B	Born-global	U.S.	C	C		R	S	x	C	C	
Supplier C	Incremental	China	C	S	x	C	S	x	R	S	x
Supplier D	Born-global	China	R	S	x	R	S	x	C	S	x
Supplier E	Incremental	China	R	S	x	R	S	x	C	S	x
Supplier F	Born-global	U.S.	S	S		R	S	x	S	S	
Supplier G	Born-global	U.S.	C	C		R	S	x	C	C	
Supplier H	Born-global	Japan	R	S	x	R	R		C	C	
Supplier I	Incremental	China	NA	NA		R	S	x	C	S	
Supplier J	Incremental	China	R	R		C	S	x	S	S	
Supplier K	Born-global	U.S.	C	C		R	S	x	S	S	
Supplier L	Born-global	Japan	R	S	x	C	C		C	S	x
Supplier M	Incremental	China	NA	NA		R	S	x	S	NA	

S Strategic resource-seeking, *C* Capability-based bricolage, *R* Relationship-based bricolage

early stages, Supplier A's internationalization strategy formation process in the Japanese market was mostly relationship-based bricolage (R), whereas today, the supplier's expansion was driven by a strategically-directed resource-seeking process (S). The table also shows whether each supplier has experienced major oscillation in each market. A 'x' is placed in the column 'oscillate' if the supplier's dominant strategy formation process had changed. The table suggests that firms in this study, which were among the most successful IT service suppliers based in China, were able to strategically leverage three decision-making processes and dynamically oscillate between them to simultaneously facilitate the acquisition of operation capabilities, growth of client relationships, and development of internationalization strategies.

Joining Table 2 which describes the suppliers' internationalization process with Table 3 which explains the suppliers' decision-making process, the study has identified several important patterns. First, most of the thirteen suppliers relied on bricolage, either capability-based or relationship-based, during the entry into their first markets. Specifically, all eight born-global suppliers and three of the five incremental internationalizing suppliers pursued the bricolage process for their initial market entry. In the resource-constrained environment which most Chinese IT suppliers faced at their inception, such an entrepreneurial approach allowed the suppliers to capitalize on new opportunities that emerged in China's rapid transformation, and create an idiosyncratic advantage during the early stages of the firms' development.

Second, all thirteen suppliers focused on relationship-based bricolage during their entry into their first international markets. Relationships with major foreign clients could be difficult to develop for Chinese suppliers and posed a major entry barrier. However, once established, such client relationships provided the suppliers with an important channel for acquiring operation capability and rapidly expanding their business in international markets.

Finally, all thirteen suppliers experienced oscillation between bricolage and resource-seeking in at least one market. Such oscillation had also occurred across markets. For example, Supplier L's entry into the Japanese market was driven by relationship-based bricolage. The firm's growth in Japan enabled it to acquire capabilities in a key industry. The supplier subsequently leveraged its experience in Japan and successfully pursued capability-based bricolage in the same industry in the domestic market. Similar cross-market oscillation was also identified by Suppliers A, D, and H. Overall, the above patterns reflect the highly emergent and adaptive decision-making process in the inception and internationalization of these suppliers.

6 Conclusions and Discussion

This study explored internationalization and growth of Chinese IT service firms. Based on qualitative case studies of thirteen major Chinese IT service suppliers, this study showed that when facing three major markets with significantly different

outsourcing practices, Japan, U.S., and China, some suppliers followed the traditional, incremental model of internationalization, while others started working with foreign clients right at or shortly after the suppliers' foundation. For both types of suppliers, the firm's internationalization was shaped by: first, the supplier's deliberate, strategic selection of timing and approaches for entering different markets; second, the supplier's ability to deliver the outsourced products and services to clients; third, the supplier's portfolio of contractual relationships with its clients. Based on these three factors, the supplier pursued three decision-making processes: first, a process of resource seeking directed by the supplier's explicit internationalization strategy; second, a process of bricolage driven by the supplier's current operation capability; third, a process of bricolage driven by the supplier's existing client relationship. Over time, the supplier dynamically oscillated between these three different decision-making processes. The process of bricolage, in particular, played a critical role in the supplier's growth in both international and domestic markets, enabling the supplier to move toward the higher end of the global value chain.

This research contributes to the IS literature by elaborating IT service suppliers' entry and expansion in different markets, and offering a fine-grained view of the highly dynamic decision-making process of these firms. In addition, this study focuses on a unique, understudied new category of firms: entrepreneurial, rapidly-internationalizing IT service firms from emerging economies, and assists to shed light on the rapid transformation of IT service industry in China, an underrepresented location in the IS literature.

This study also contributes to IB research by conceptualizing the decision-making process of international ventures from emerging markets. The findings highlight bricolage as an effective approach for international entrepreneurship, and identify the oscillation between bricolage and resource-seeking as the underlying strategy process of firm's entry and expansion in multiple markets. Overall, this study highlights the dynamic, emergent decision processes of both incremental internationalizing firms and born-globals. Such a conceptual refinement is important to the development of a realistic, time-based view of international entrepreneurship (Rialp et al. 2005; Benito et al. 2009; Rialp-Criado et al. 2010).

This study has its practical implications. For emerging IT service suppliers, this study shows that internationalization often centers on opportunistically and flexibly leveraging existing capabilities or relationships. In this process, entrepreneurial middle-level managers can play a key role. Suppliers may, therefore, incentivize such internal venturing in order to sense and respond to new opportunities. For clients, this study shows that it is critical to understand the supplier's decision rationale, and align the client's outsourcing strategy with the supplier's growth strategy. In China's current IT service industry, major suppliers are very strategic in their selection of clients and outsourcing contracts. Experience shows that a strategically-aligned, mutually-committed relationship with major suppliers often led to high performance and a client-supplier relationship that can bring long-term value to both parties.

This study has its limitations. The case study research method may lead to some context-specificity. However, the overall theoretical model is not limited to Chinese IT service firms. Additionally, most of the informants from the thirteen firms except Supplier A were senior executives. Ideally, more interviews with middle-level managers as well as junior-level employees from all firms are needed to obtain a more complete view of these suppliers.

A number of questions can to be explored in future research. For example, the various internal and external factors that have shaped the extent to which different decision-making processes are enacted need to be further identified. Additionally, comparison with suppliers from other emerging markets can be conducted. Indian suppliers, in particular, can provide an interesting comparison with Chinese suppliers. It would also be interesting to compare Chinese IT service firms with Chinese manufacturing firms, some of which are also actively seeking to become more competitive and innovative players in the global value chain.

References

Abbott, P., Zheng, Y., Du, R., & Willcocks, L. (2013). From boundary spanning to creolization: A study of Chinese software and services outsourcing vendors. *Journal of Strategic Information Systems*, (in press).

Abbott, P., Zheng, Y., Modi, S., & Du, R. (2012). Moving up the value chain: Exploring the issues for Chinese software and services outsourcers. *Pacific Asia Conference on Information Systems (PACIS) 2012 Proceedings*, Paper 139.

Acs, A., Dana, L., & Jones, M. V. (2003). Toward new horizons: The internationalisation of entrepreneurship. *Journal of International Entrepreneurship, 1*(1), 5–12.

Andersen, O. (1993). On the internationalization process of firms: A critical analysis. *Journal of International Business Studies, 24*(2), 209–231.

Ang, S., & Inkpen, A. C. (2008). Cultural intelligence and offshore outsourcing success: A framework of firm-level intercultural capability. *Decision Sciences, 39*(3), 337–358.

Armbrust, M., Fox, A., Griffith, R., Joseph, A. D., Katz, R., Konwinski, A., et al. (2010). A View of cloud computing. *Communications of the ACM, 53*(4), 50–58.

Autio, E., Sapienza, H. J., & Almeida, J. G. (2000). Effects of age at entry, knowledge intensity, and imitability on international growth. *Academy of Management Journal, 43*(5), 909–924.

Autio, E., George, G., & Alexy, O. (2011). International entrepreneurship and capability development—Qualitative evidence and future research directions. *Entrepreneurship Theory and Practice, 35*(1), 11–37.

Baker, T., Miner, A. S., & Eesley, D. T. (2003). Improvising firms: Bricolage, account giving and improvisational competencies in the founding process. *Research Policy, 32*, 255–276.

Baker, T., & Nelson, R. E. (2005). Creating something from nothing: Resource construction through entrepreneurial bricolage. *Administrative Science Quarterly, 50*(3), 329–366.

Bansal, P., & Corley, K. (2011). From the editors: The coming of age for qualitative research: embracing the diversity of qualitative methods. *Academy of Management Journal, 54*(2), 233–237.

Bapna, R., Barua, A., Mani, D., & Mehra, A. (2010). Cooperation, coordination, and governance in multisourcing: An agenda for analytical, and empirical research. *Information Systems Research, 21*(4), 785–795.

Benbasat, I., Goldstein, D. K., & Mead, M. (1987). The case research strategy in studies of information systems. *MIS Quarterly, 11*(3), 369–386.

Benito, G., Petersen, B., & Welch, L. (2009). Towards more realistic conceptualisations of foreign operation modes. *Journal of International Business Studies, 40*(9), 1455–1470.
Bilkey, W., & Tesar, G. G. (1977). The export behavior of smaller-sized Wisconsin manufacturing firms. *Journal of International Business Studies, 8*(1), 93–98.
Calof, J. L., & Beamish, P. W. (1995). Adapting to foreign markets: Explaining internationalization. *International Business Review, 4*(2), 115–131.
Carmel, E., & Agarwal, R. (2002). The maturation of offshore sourcing of information technology work. *MIS Quarterly Executive, 1*(2), 65–78.
Carmel, E., Gao, G., & Zhang, N. (2008). The maturing Chinese offshore IT services industry: It takes 10 years to sharpen a sword. *MIS Quarterly Executive, 7*(4), 157–170.
Cavusgil, T. (1980). On the internationalization process of firms. *European Research, 8*, 273–281.
Child, J., & Rodrigues, S. B. (2005). The internationalization of Chinese firms: A case for theoretical extension? *Management and Organization Review, 1*(3), 381–410.
China Business News. (2007). Software outsourcing industry discovers blue ocean: European and U.S. markets have higher profitability. Retrieved from http://news.ccidnet.com/art/1032/20070105/994261_1.html.
China Ministry of Commerce. (2011). China Software Export Development Report 2011.
Chinasourcing. (2008). Top 50 service outsourcing providers in China 2008. Retrieved from http://www.chnsourcing.com/top50/2008/.
Ciborra, C. U. (1996). The platform organization: Recombining strategies, structures, and surprises. *Organization Science, 7*(2), 103–118.
Coviello, N. E., & Cox, M. P. (2006). The resource dynamics of international new venture networks. *Journal of International Entrepreneurship, 4*(2–3), 113–132.
Cross, J. (1995). IT outsourcing: British petroleum. *Harvard Business Review, 73*(3), 94–102.
Crossan, M., Cunha, M. P. E., Vera, D., & Cunha, J. (2005). Time and organizational improvisation. *Academy of Management Review, 30*(1), 129–145.
Cullen, S., Seddon, P., & Willcocks, L. (2005). IT outsourcing configuration: Research into defining and designing outsourcing arrangements. *The Journal of Strategic Information Systems, 14*(4), 357–387.
Dana, L. P., Etemad, H., & Wright, R. W. (1999). Theoretical foundations of international entrepreneurship. In R.W. Wright (Ed.), *Research in global strategic management* (Vol. 7, pp. 3–22). Stamford: JAI Press.
Davidsson, P., & Honig, B. (2003). The role of social and human capital among nascent entrepreneurs. *Journal of Business Venturing, 18*(3), 301–331.
Deng, P. (2009). Why do Chinese firms tend to acquire strategic assets in international expansion? *Journal of World Business, 44*(1), 74–84.
Di Domenico, M., Haugh, H., & Tracey, P. (2010). Social bricolage: Theorizing social value creation in social enterprises. *Entrepreneurship Theory and Practice, 34*(4), 681–703.
Dib, L. A., da Rocha, A., & da Silva, J. F. (2010). The internationalization process of Brazilian software firms and the born global phenomenon: Examining firm, network, and entrepreneur variables. *Journal of International Entrepreneurship, 8*, 233–253.
Dibbern, J., Goles, T., Hirschheim, R., & Jayatilaka, B. (2004). Information systems outsourcing: A survey and analysis of the literature. *The Database, 3*(4), 6–102.
Du, W., & Pan, S. L. (2010). Boundary spanning by design: Insights from a vendor perspective. *Proceedings of International Conference on Information Systems*, Paper 222.
Dubé, L., & Paré, G. (2003). Rigor in information systems positivist case research: Current practices, trends, and recommendations. *MIS Quarterly, 27*(4), 597–636.
Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review, 14*(4), 532–550.
Etemad, H., Wilkinson, I., & Dana, L. P. (2010). Internetization as the necessary condition for internationalization in the newly emerging economy. *Journal of International Entrepreneurship, 8*, 319–342.

Ethiraj, S., Kale, P., Krishnan, M., & Singh, J. (2005). Where do capabilities come from and how do they matter? A study in the software services industry. *Strategic Management Journal, 26*(1), 25–45.

George, G., & Prabhu, G. N. (2000). Developmental financial institutions as catalysts of entrepreneurship in emerging economies. *Academy of Management Review, 25*(3), 620–629.

Goo, J., Kishore, R., Rao, H. R., & Nam, K. (2009). The role of service level agreements in relational management of information technology outsourcing: An empirical study. *MIS Quarterly, 33*(1), 119–145.

Gopal, A., Sivaramakrishnan, K., Krishnan, M. S., & Mukhopadhyay, T. (2003). Contracts in offshore software development: An empirical analysis. *Management Science, 49*(12), 1671–1683.

Gray, B. J., & McNaughton, R. (2010). Knowledge, values and internationalisation—Introduction to the special edition. *Journal of International Entrepreneurship, 8*, 115–120.

Guthrie, D. (2001). *Dragon in a three-piece suit: the emergence of capitalism in China*. Princeton: Princeton University Press.

Guthrie, D. (2005). Organizational learning and productivity: State structure and foreign investment in the rise of the Chinese corporation. *Management and Organization Review, 1*(2), 165–195.

Guillén, M. F., & García-Canal, E. (2009). The American model of the multinational firm and the "new" multinationals from emerging economies. *Academy of Management Perspectives, 23*(2), 23–35.

Helfat, C. E., & Lieberman, M. B. (2002). The birth of capabilities: Market entry and the importance of pre-history. *Industrial and Corporate Change, 11*(4), 725–760.

Hirschheim, R. A., & Lacity, M. C. (2000). The myths and realities of information technology insourcing. *Communications of the ACM, 43*(2), 99–107.

Hoskisson, R. E., Eden, L., Lau, C. M., & Wright, M. (2000). Strategy in emerging economies. *Academy of Management Journal, 43*(3), 249–267.

IAOP (International Association of Outsourcing Professionals). (2008). The 2008 global outsourcing 100. Retrieved from http://www.iaop.org/content/23/152/1619/.

IAOP (International Association of Outsourcing Professionals). (2009). The 2009 global outsourcing 100. Retrieved from http://www.iaop.org/content/23/152/1858/.

IAOP (International Association of Outsourcing Professionals). (2010a). The 2010 global outsourcing 100 sub-lists. Retrieved from http://www.iaop.org/Content/19/165/3181.

IAOP (International Association of Outsourcing Professionals). (2010b). The 2010 global outsourcing 100. Retrieved from http://www.iaop.org/Content/19/165/3179.

IAOP (International Association of Outsourcing Professionals). (2011). The 2011 global outsourcing 100. Retrieved from http://www.iaop.org/content/23/152/2040.

Janssen, M., & Joha, A. (2008). Emerging shared service organizations and the service-oriented enterprise: Critical management issues. *Strategic Outsourcing: An International Journal, 1*(1), 35–49.

Jarvenpaa, S. L., & Mao, J. Y. (2008). Operational capabilities development in mediated offshore software services models. *Journal of Information Technology, 23*(1), 3–17.

Johanson, J., & Vahlne, J. E. (1977). The internationalization process of the firm: A model of knowledge development and increasing foreign market commitment. *Journal of International Business Studies*, *8*, 23–32.

Johanson, J., & Vahlne, J. E. (1990). The mechanism of internationalization. *International Marketing Review, 7*(4), 11–24.

Johanson, J., & Vahlne, J. E. (2009). The Uppsala internationalization process model revisited: From liability of foreignness to liability of outsidership. *Journal of International Business Studies, 40*(9), 1411–1431.

Johanson, J., & Wiedersheim-Paul, F. (1975). The internationalization of the firm: Four swedish cases. *Journal of Management Studies, 12*(3), 305–322.

Kaiser, K., & Hawk, S. (2004). Evolution of offshore software development: From outsourcing to cosourcing. *MIS Quarterly Executive, 3*(2), 69–81.

Kishore, R., Agarwal, M., & Rao, H. R. (2004). Determinants of sourcing during technology growth and maturity: An empirical study of e-commerce sourcing. *Journal of Management Information Systems, 21*(3), 47–82.

Kiss, A. N., Danis, W. M., & Cavusgil, S. T. (2012). International entrepreneurship research in emerging economies: A critical review and research agenda. *Journal of Business Venturing, 27*, 266–290.

Knight, G. A., & Cavusgil, S. T. (1996). The born global firm: A challenge to traditional internationalization theory. *Advances in International Marketing, 8*, 11–26.

Knight, G. A., & Cavusgil, S. T. (2004). Innovation, organizational capabilities, and the born-global firm. *Journal of International Business Studies, 35*(2), 124–141.

Koh, C., Ang, S., & Straub, D. W. (2004). IT outsourcing success: A psychological contract perspective. *Information System Research, 15*(4), 356–373.

KPMG. (2010). China emerges as an outsourcing giant. Retrieved from http://www.kpmg.com/CN/en/PressRoom/PressReleases/Pages/press_20090429b.aspx.

Kuivalainen, O., Puumalainen, K., Sintonen, S., & Kyläheiko, K. (2010). Organisational capabilities and internationalisation of the small and medium-sized information and communications technology firms. *Journal of International Entrepreneurship, 8*, 135–155.

Lanzara, G. F. (1999). Between transient constructs and persistent structures: Designing systems in action. *Journal of Strategic Information Systems, 8*, 331–349.

Lacity, M. C., Khan, S., Yan, A., & Willcocks, L. P. (2010). A review of the IT outsourcing empirical literature and future research directions. *Journal of Information Technology, 25*, 395–433.

Lee, C., Lee, K., & Pennings, J. M. (2001). Internal capabilities, external networks and performance: A study on technology-based new ventures. *Strategic Management Journal, 22*(6–7), 615–640.

Leonard-Barton, D. (1990). A dual methodology for case studies: Synergistic use of a longitudinal single site with replicated multiple sites. *Organization Science*, *1*(3) (Special Issue: Longitudinal field research methods for studying processes of organizational change), 248–266.

Levina, N., Gallivan, M., Su, N., Pan, S. L., Hsu, J., & Mao, J. Y. (2011). Studying China's IT services industry: Generalizations, particularities, and the competitive outlook. *ICIS 2011 Proceedings*, Paper 6.

Levina, N., & Ross, J. (2003). From the vendor's perspective: Exploring the value proposition in IT outsourcing. *MIS Quarterly, 27*(3), 331–364.

Levina, N., & Su, N. (2008). Global multisourcing strategy: The emergence of a supplier portfolio in services offshoring. *Decision Sciences, 39*(3), 541–570.

Levina, N., & Vaast, E. (2008). Innovating or doing as told? Status differences and overlapping boundaries in offshore collaboration. *MIS Quarterly, 32*(2), 307–332.

Lévi-Strauss, C. (1967). *The savage mind*. Chicago, IL: University of Chicago Press.

Liu, X., Wang, C., & Wei, Y. (2009). Do local manufacturing firms benefit from transactional linkages with multinational enterprises in China? *Journal of International Business Studies, 40*, 1113–1130.

Loh, L., & Venkatraman, N. (1992). Determinants of information technology outsourcing: A cross-sectional analysis. *Journal of Management Information Systems, 9*(1), 7–24.

Lu, J. W., & Beamish, P. W. (2001). The internationalization and performance of SMEs. *Strategic Management Journal, 22*(6/7), 565–586.

Luo, Y., & Tung, R. L. (2007). International expansion of emerging market enterprises: A springboard perspective. *Journal of International Business Studies, 38*(4), 481–498.

Madhok, A. (1997). Cost, value and foreign market entry mode: The transaction and the firm. *Strategic Management Journal, 18*(1), 39–61.

Makino, S., Lau, C., & Yeh, R. (2002). Asset-exploitation versus asset-seeking: Implications for location choice of foreign direct investment from newly industrialized economies. *Journal of International Business Studies, 33*(3), 403–421.

Mathews, J. A., & Zander, I. (2007). The international entrepreneurial dynamics of accelerated internationalisation. *Journal of International Business Studies, 38*(3), 387–403.
McDougall, P., & Oviatt, B. (2000). International entrepreneurship: The intersection of two research paths. *Academy of Management Journal, 43*(5), 902–906.
Mejri, K., & Umemoto, K. (2010). Small- and medium-sized enterprise internationalization: Towards the knowledge-based model. *Journal of International Entrepreneurship, 8*(2), 156–167.
Melin, L. (1992). Internationalization as a strategy process. *Strategic Management Journal, 13*(Special Issue on Fundamental themes in strategy process research), 99–118.
Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis*. Thousand Oaks, CA: Sage.
Moen, O., & Servais, P. (2002). Born global or gradual global? Examining the export behaviour of small and medium-sized enterprises. *Journal of International Marketing, 10*(3), 49–72.
Moorman, C., & Miner, A. S. (1998). Organizational improvisation and organizational memory. *Academy of Management Review, 23*(4), 698–723.
Murray, J. Y., Kotabe, M., & Zhou, J. N. (2005). Strategic alliance-based sourcing and market performance: Evidence from foreign firms operating in China. *Journal of International Business Studies, 36*, 187–208.
Nasscom. (2010). IT-BPO Sector in India: Strategic Review 2010, Executive Summary. Retrieved from http://www.nasscom.in/upload/SR10/ExecutiveSummary.pdf.
Naudé, W., & Rossouw, S. (2010). Early international entrepreneurship in China: Extent and determinants. *Journal of International Entrepreneurship, 8*, 87–111.
Nummela, N., & Welch, C. (2007). Qualitative research methods in international entrepreneurship: Introduction to the special issue. *Journal of International Entrepreneurship, 4*(4), 133–136.
Ojala, A., & Tyrväinen, P. (2006). Business models and market entry mode choice of small software firms. *Journal of International Entrepreneurship, 4*(2–3), 69–81.
Oshri, I., Kotlarsky, J., Rottman, J., & Willcocks, L. (2009). Global sourcing: Recent trends and issues. *Information Technology and People, 22*(3), 192–200.
Oviatt, B. M., & McDougall, P. P. (1994). Toward a theory of international new ventures. *Journal of International Business Studies, 25*(1), 45–64.
Oviatt, B. M., & McDougall, P. P. (1997). Challenges for internationalization process theory: The case of international new ventures. *Management International Review, 37*(2), 85–99.
Oviatt, B. M., & McDougall, P. P. (2005). Toward a theory of international new ventures. *Journal of International Business Studies, 36*, 29–41.
Peng, M. W. (2001). The resource-based view and international business. *Journal of Management, 27*, 803–829.
Peng, M. W., Wang, D. Y., & Jiang, Y. (2008). An institution-based view of international business strategy: A focus on emerging economies. *Journal of International Business Studies, 39*, 920–936.
Pettigrew, A. M. (1990). Longitudinal field research on change: Theory and practice. *Organization Science, 1*(3), 267–292.
Piekkari, R., & Welch, C. (2006). Guest editors' introduction to the focused issue: Qualitative research methods in international business. *Management International Review, 46*(4), 391–396.
Prashantham, S. (2005). Toward a knowledge-based conceptualization of internationalization. *Journal of International Entrepreneurship, 3*(1), 37–52.
Qu, Z., & Brocklehurst, M. (2003). What will it take for China to become a competitive force in offshore outsourcing? An analysis of the role of transaction costs in supplier selection. *Journal of Information Technology, 18*(1), 53–67.
Rangan, S., & Sengul, M. (2009). Information technology and transnational integration: Theory and evidence on the evolution of the modern multinational enterprise. *Journal of International Business Studies, 40*(9), 1496–1514.
Reid, S. D. (1981). The decision-maker and export entry and expansion. *Journal of International Business Studies, 12*(2), 101–112.

Rennie, M. W. (1993). Global competitiveness: Born global. *McKinsey Quarterly, 4*, 45–52.
Rialp, A., Rialp, J., Urbano, D., & Vaillant, Y. (2005). The born-global phenomenon: A comparative case study research. *Journal of International Entrepreneurship, 3*(2), 133–171.
Rialp-Criado, A., Galván-Sánchez, I., & Suárez-Ortega, S. M. (2010). A configuration-holistic approach to born-global firms' strategy formation process. *European Management Journal, 28*(2), 108–123.
Rottman, J., & Hao, L. (2008). Can China compete with india in the global ITO/BPO market? In M. Lacity, & J. Rottman (Eds.), *Offshore outsourcing of IT work*, (pp. 180–208). London: Palgrave.
Saarenketo, S., Puumalainen, K., Kuivalainen, O., & Kyläheiko, K. (2004). On dynamic knowledge-related learning processes in internationalizing high-tech SME's. *International Journal of Production Economics, 89*(3), 363–378.
Schweizer, R., Vahlne, J. E., & Johanson, J. (2010). Internationalization as an entrepreneurial process. *Journal of International Entrepreneurship, 8*(4), 343–370.
Schwens, C., & Kabst, R. (2009). Early internationalization: A transaction cost economics and structural embeddedness perspective. *Journal of International Entrepreneurship, 7*, 323–340.
Shane, S., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review, 25*(1), 217–226.
Siggelkow, N. (2007). Persuasion with case studies. *Academy of Management Journal, 50*(1), 20–24.
Sinkovics, R. R., & Bell, J. D. (2006). Current perspectives on international entrepreneurship and the internet. *Journal of International Entrepreneurship, 3*(4), 247–249.
Strauss, A. L., & Corbin, J. M. (1997). *Grounded theory in practice*. Thousand Oaks, CA: Sage Publications.
Su, N. (2011). Emergence of cloud computing: An institutional innovation perspective. *Proceedings of the 32nd International Conference on Information Systems*, St Louis, M.O., U.S.A., Paper 11.
Su, N., Akkiraju, R., Nayak, N., & Goodwin, R. (2009). Shared services transformation: conceptualization and valuation from the perspective of real options. *Decision Sciences, 40*(3), 381–402.
Su, N., & Levina, N. (2011). Global multisourcing strategy: Integrating learning from manufacturing into IT service outsourcing. *IEEE Transactions on Engineering Management, 58*(4), 717–729.
Thomas, C., Kaminska-Labbe, R., & McKelvey, B. (2005). Managing the MNC and exploitation/exploration dilemma: From static balance to dynamic oscillation. In G. Szulanski, J. Porac, & Y. Doz (Eds.), *Strategy process: Advances in strategic management* (Vol. 22, pp. 213–247). Amsterdam: Elsevier.
Tiwana, A., & Keil, M. (2007). Does peripheral knowledge complement control? A study of technology outsourcing alliances. *Strategic Management Journal, 28*(6), 623–634.
Torkkeli, L., Puumalainen, K., Saarenketo, S., & Kuivalainen, O. (2012). The effect of network competence and environmental hostility on the internationalization of SMEs. *Journal of International Entrepreneurship10*(1), 25–49.
Van de Ven, A. H., & Poole, M. S. (1995). Explaining development and change in organizations. *Academy of Management Review, 20*(3), 510–540.
Weick, K. E. (1998). Introductory essay: Improvisation as a mindset for organizational analysis. *Organization Science, 9*(5), 543–555.
Wright, M., Filatotchev, I., Hoskisson, R. E., & Peng, M. W. (2005). Strategy research in emerging economies: Challenging the conventional wisdom. *Journal of Management Studies, 42*(1), 1–33.
Xinhua. (2007). China becomes Japan's biggest software outsourcing base. Retrieved from http://news.xinhuanet.com/english/2007-04/12/content_5968762.htm.
Yamakawa, Y., Peng, M., & Deeds, D. (2008). What drives new ventures to internationalize from emerging to developed economies? *Entrepreneurship Theory and Practice, 32*(1), 59–82.

Yin, R. K. (2003). *Case study research: Design and methods* (3rd ed.). Beverly Hills, CA: Sage Publications.

Yiu, D. W., Lau, C., & Bruton, G. D. (2007). International venturing by emerging economy firms: The effects of firm capabilities, home country networks, and corporate entrepreneurship. *Journal of International Business Studies, 38*, 519–540.

Yli-Renko, H., Autio, E., & Tontii, V. (2002). Social capital, knowledge, and the international growth of technology-based new firms. *International Business Review, 11*(3), 279–304.

Young, Y., Dimitratos, P., & Dana, L. (2003). International entrepreneurship research: What scope for international business theories? *Journal of International Entrepreneurship, 1*(1), 31–42.

Zahra, S. A., Matherne, B. P., & Carleton, J. M. (2003). Technological resource leveraging and the internationalization of new ventures. *Journal of International Entrepreneurship, 1*(2), 163–186.

Zhang, M., Sarker, S., & Sarker, S. (2008). Unpacking the effect of IT capability on the performance of export-focused SMEs: A report from China. *Information Systems Journal, 18*(4), 357–380.

Part VI
Social Responsibility and Social Capital Management

The Impact of Impact Sourcing: Framing a Research Agenda

Erran Carmel, Mary C. Lacity and Andrew Doty

Abstract Impact sourcing is a sourcing model that aims to transform people's lives, families, and communities through meaningful employment in the Information Technology Outsourcing (ITO), Business Process Outsourcing (BPO) and digitally-enabled microwork sectors. Globally, impact sourcing may employ as many as 561,000 people and may generate as much as $20 billion world-wide by 2015. Despite the potential value of impact sourcing, there is little research on this emerging phenomenon. The aim of this paper is to develop an impact sourcing research framework that identifies key stakeholders and constructs and directs future research. The framework comprises an ecosystem of different stakeholders, including the impact sourcers (the providers), employees of impact sourcers, communities where employees reside, and clients of impact sourcing services. The framework also includes global issues, like location attractiveness, and public policy issues. Although more research is needed on all the key constructs identified in the framework, we posit that the most important of these is the impact of impact sourcing on the employees (the people whose lives are presumably improving as a result of impact sourcing) and the communities around them.

Keywords Impact sourcing · Ethical sourcing · Sustainable global outsourcing · Micro-work · Social outsourcing

E. Carmel
Professor of Information Technology and UPS Scholar Kogod School of Business, American University, Washington, DC 20016-8044, USA
e-mail: Carmel@american.edu

M.C. Lacity (✉)
Curators' Professor of Information Systems College of Business, University of Missouri-St. Louis, One University Boulevard, St. Louis, MO 63121, USA
e-mail: Mary.Lacity@umsl.edu

A. Doty
Monitoring and Evaluation Senior Fellow Village Enterprise, San Carlos, CA 94070, USA
e-mail: ajd@villageef.org

R. Hirschheim et al. (eds.), *Information Systems Outsourcing*, Progress in IS,
DOI 10.1007/978-3-662-43820-6_16

1 Introduction

Impact sourcing is an emerging phenomenon that aims to transform people's lives, families, and communities through meaningful employment in the Information Technology Outsourcing (ITO) or Business Process Outsourcing (BPO) sectors (Lacity et al. 2012). The Rockefeller Foundation has been the leading global institution promoting impact sourcing through its Digital Jobs Africa Initiative. The Rockefeller Foundation supported two key reports by The Monitor Group (2011) and Avasant (2012). In The Monitor Group/Rockefeller Foundation (2011), impact sourcing is defined as "employing people at the bottom of the base of the pyramid, with limited opportunity for sustainable employment, as principal workers in business process outsourcing (BPO) centers to provide high-quality, information-based services to domestic and international clients" (p. 2). In addition to the Rockefeller Foundation, The Monitor Group, and Avasant, a number of organizations, like the International Association of Outsourcing Professionals (IAOP 2009) and National Association of Software and Services Companies (NASSCOM) foundation,[1] and scholars have begun to examine impact sourcing (Heeks 2012a, b; Lacity et al. 2012) and its related concepts, ethical sourcing (Heeks 2012a, b), sustainable global outsourcing (Babin and Nicholson 2009, 2012), micro-work (Gino and Staats 2012), corporate social responsibility (CSR) in outsourcing (Babin 2008), social outsourcing (Heeks and Arun 2010), and rural sourcing (Lacity et al. 2011).

Impact sourcing comprises an ecosystem of different stakeholders, including the impact sourcing organizations (impact sourcers), employees of impact sourcers, communities where employees reside, and clients of impact sourcing services (Accenture 2012). To date, most of the research has focused on only two of these stakeholders—the impact sourcers and their clients. As an emerging phenomenon, our understanding of the main dependent variable—the *impact* of impact sourcing—is still quite preliminary, particularly for the effects of impact sourcing on employees and communities. In fact, most of the key sources in this paper date only a few years back, except those related to more generic international development.

The aim of this paper is to develop an impact sourcing framework that defines and categorizes key stakeholders and constructs and directs future research. Frameworks are useful to circumscribe emerging phenomena like impact sourcing. Frameworks should be comprehensive (broad enough to encompass relevant constructs), parsimonious (narrow enough to focus meaningful inquiry), distinctive (identifying the core constructs), and adoptable (constructs can be operationalized) (Lacity 1990; Gorry and Scott Morton 1971; Mason and Mitroff 1973; Ives et al. 1980).

To inform the development of a research framework, we draw on a number of related disciplines. From the Information Systems literature, we are beginning to

[1] http://www.nasscomfoundation.org/

understand the impact sourcing phenomenon from the perspectives of impact sourcing organizations, i.e., impact sourcers, and impact sourcing clients. *Impact sourcers* are the entrepreneurial organizations hiring, training and employing marginalized populations in ITO and BPO delivery centers (Lacity et al. 2012). *Impact sourcing clients* are the client organizations purchasing ITO and BPO services from impact sourcers (Heeks 2012a, b; Lacity et al. 2012). The IS literature is also informing the phenomenon by understanding how Western-based client firms insert CSR objectives into ITO and BPO provider assessments (Babin and Nicholson 2012). Strategy literature also informs the broader issues of CSR (Porter and Kramer 2006) and its newer concept, Creating Shared Value (CSV) (Porter and Kramer 2011). However, the IS and strategy literatures to date have not examined thoroughly the impact of impact sourcing on the key stakeholder, the *employees*, i.e., the people whose lives are presumably changing as a result of impact sourcing. We see this gap as our primary call for future research.

The analysis and means of understanding the social impacts of impact sourcing may best be informed by the *International Development* literature, including work on socially responsible investing (Viviers and Eccles 2012) and the digital divide (Doong and Ho 2012). Impact Sourcing is also unique in that it shares some aspects of emerging pro-poor, market-based, poverty reduction strategies, but cannot be classified or analyzed entirely as such. Some terms, points of reference and metrics for monitoring and evaluating impacts and outcomes can be drawn from the field of *social entrepreneurship* and *social investment*, while other metrics are drawn directly from the development literature. The interplay of these different disciplines makes impact sourcing unique in its approach and its execution.

We begin with refining the definition of impact sourcing.

2 How Is Impact Sourcing Best Defined?

We revisit the definition of impact sourcing by the reports sponsored by the Rockefeller Foundation and then review other definitions by Gino and Staats (2012), Accenture (2012), and Heeks (2012a, b). Each definition describes a type of population targeted for employment and the type of work performed. We then offer our own definition that considers the core ideas from each.

As we noted in the introductory paragraph, The Monitor Group/Rockefeller Foundation (2011) defines impact sourcing as "employing people at the bottom of the base of the pyramid, with limited opportunity for sustainable employment, as principal workers in business process outsourcing (BPO) centers to provide high-quality, information-based services to domestic and international clients". This definition is prefaced by the statement: "This paper focuses on using the power of BPO to create sustainable jobs that can generate step-function income improvement for those at the base of the pyramid, defined as individuals who live on annual incomes of less than $3,000 of local purchasing power." The reports' definition emphasizes the notion of poverty, that is, people earning less than $3,000 a year, as

the main criterion for employment that qualifies as "impact sourcing". The definition also focuses solely on the *outsourcing* of *business process* work.

Gino and Staats (2012) describe impact sourcing as where one can "… hire and train people at the bottom of the pyramid to execute digital tasks like transcribing audio files and editing product databases" (p. 95). The authors call impact sourcing the "microwork solution." The definition emphasizes the notion of poverty as the main criterion for employment and low level digital tasks as the type of work. Indeed, there is an important overlap between impact sourcing and microwork. Microwork, with its many competing terms (such as human cloud and crowdsourcing; Kaganer et al.2013) describes sourcing to a distributed workforce of freelancers. Some of the tasks are so small that they have been labeled microtasking or even nanatasking. For example, The Monitor Group/Rockefeller Foundation (2011) mentioned TxtEagle, a well-know microsourcer, as an example of an Impact Sourcer. TxtEagle's business model is to pay people for tasks of short duration: a few seconds or a few minutes. Tasks are delivered and paid for on a mobile device.

Heeks (2012a, b) views impact sourcing as comprising two ways clients engage people from the bottom of the pyramid: ethical outsourcing and social outsourcing. ***Ethical outsourcing,*** also called ***socially-responsible outsourcing*** by Heeks, is when client firms add ethical requirements to commercial requirements, "typically relating to labour practices but also starting to include environmental issues". ***Social outsourcing,*** also called ***developmental outsourcing***, means contracting out to social enterprises seeking improvements in human and environmental well-being via commercial, profit-driven strategies (Heeks 2007). The definition is a client's view of engaging people from the bottom of the pyramid, or ***BoP sourcing***. Indeed, this is inspired by Prahalad's argument that sourcing is good for the Bottom of the Pyramid (Prahalad 2004). BoP sourcing and impact sourcing may be broadly put into the category of pro-poor poverty alleviation strategies. However, there is an substantive distinction between Impact Sourcing and BoP sourcing: Avasant/Rockefeller Foundation (2012) underlines this important distinction: "Impact Sourcing is a specific subsector of the BPO industry, focusing exclusively on engaging poor and vulnerable people who may not otherwise qualify for a BPO job."

Finally, Accenture (2012) defines impact sourcing as "outsourcing that benefits disadvantaged individuals in low employment areas." The definition is broader than previous definitions because "disadvantaged" individuals would not be defined solely by income level. The definition does not define the type of work, but does focus on *outsourcing*.

By considering these four definitions, we argue that the definition of impact sourcing should include a broad spectrum of "disadvantaged" individuals—or as we call them, "marginalized" individuals—as noted by Accenture (2012). We also believe that the type of work should be included in the definition, else all work, including manual labor and other BoP sourcing, might be included as impact sourcing when clearly all authors are referring to some type of IT-enabled, white collar services. We also posit that impact sourcing should include IT services, not just business process services or microwork. Finally, we believe that the definition

should not be confined to outsourcing, as organizations may choose to erect "captive" centers or other in-house forms of impact sourcing. We thus propose the following definition:

> Impact Sourcing: the practice of hiring and training marginalized individuals to provide information technology, business process, or other digitally-enabled services who normally would have few opportunities for good employment.

Our definition uses the term "marginalized" because it includes other factors than just poverty. Marginalized individuals are individuals relegated or confined to a lower or outer limit or edge of social standing. Individuals might be marginalized because of income, but also because of education, race, religion, gender, sexual orientation, disability, location, or other criteria. Furthermore, our definition focuses on IT, BP and other digitally-enabled services (like microwork) and includes both outsourcing and insourcing.

3 Measuring Impact in the Field of International Development: Literature and Practice

This paper was originally written for a *sourcing* conference that is within the field of *Information Systems.* Typically, the framing of inquiry in this discipline is on the firm, the business engagement, or the industry. However, the avenue to understanding the broader impacts of impact sourcing comes from the *International Development* literature. Impact Sourcing is novel in that it shares some aspects of emerging pro-poor, market based, poverty reduction strategies, but cannot be classified or analyzed entirely as such.

The goal of the field of international development is to make positive changes for human life, primarily in low income nations. The international development field has been tackling the measurement question for decades as a result of many billions of dollars spent on interventions in nearly every nation on the planet.

In international development two constructs—monitoring and evaluation—are inextricably linked (PMD Pro Guide 2010). Impact evaluation is the more technical, and often more complex side of the coin. According to the International Fund for Agricultural Development (IFAD), evaluation is a more periodic process that takes on fundamental questions about program progress (IFAD 2002). Monitoring, in a formal capacity, occurs when outputs and outcomes are compared to data about select indicators and performance targets.

3.1 Measuring Impact in Practice

How are these concepts implemented? We look at three of the leading social entrepreneurship organizations—TechnoServe, Ashoka and Root Capital—in order to understand the approaches of evaluation and monitoring currently used in

the field. We culled and adapted from the concepts introduced by these three organizations, and described below, to help build Table 1—which is our central display that appears later in Sect. 4.

TechnoServe looks at impacts in three principal areas: direct market players, suppliers, and the business environment (TechnoServe 2014). For each of the components of the market system, it looks at specific impacts. As such, for direct market players, it looks at increases in revenues[2] (315 USD million earned in revenue and $81 million in profit), transformation of lives (2.5 million men, women and children benefited from TechnoServe income sources), and the number of purchased products (142 USD millions of product was purchased from 447,000 small businesses). For suppliers Technoserve looks at the number of businesses that benefited from TechnoServe services and products. It calls this "building business and industry," and then it shows that 4,500 businesses were assisted in 12 industries. Finally, business environment is also measured by the number of people who were employed (employed 61,000 employees who earned 20 USD million in wages).

TechnoServe takes a holistic approach to understanding impact, not isolating only impacts on livelihoods of beneficiaries, but looking at the whole system of participants in the 'market.' In theory, this allows assessments to catch spillover effects from and between categories.

Ashoka is a well-known social enterprise agency. Ashoka highlights systemic change as an impact, defining it as: "shifting societal perceptions, encouraging new behavior patterns, and revolutionizing entire fields" (Leviner et al. 2007). The firm designed an approach called the Measuring Effectiveness (ME) method. It is a survey sent to fellows asking them about effectiveness using several proxy variables. The proxy variables identify ways in which perceptions have changed, new behaviors have emerged, and how a field may have changed. The proxy variables include: replication of a fellows' idea, influence on public policy, whether the fellow is still working towards original vision, and what position the organization holds in the field (see Fig. 1).

The evaluation is conducted in two parts, first through an annual survey to measure outputs, to see if entrepreneurs are meeting benchmarks at the end of each year. These benchmarks are established at the beginning of the fellowship period. The second portion measures longer term outputs—sent at 5 and then at 10 years—to see how much of their work is being used and replicated. The final piece is a series of case studies to gather more in-depth qualitative data.

Ashoka's method of evaluation includes short-term methods to understand and evaluate outputs, and long-term methods to evaluate outcomes. It also includes quantitative measures (whether programs are meeting benchmarks set at the beginning of the fellowship), and qualitative methods of inquiry through the surveys and the case studies. This mix of quantitative and qualitative methods provides greater depth of analysis, forming a hybrid of models to answer multiple questions.

[2] The numbers that are used for illustration are for Technoserve and are not about impact sourcing.

Table 1 Impact sourcing research framework

	Impact sourcers	Clients	Employees	Communities	Global and government issues
Key constructs	Business models[a, c]	Value proposition[a, b]	Marginalized individuals[b]	Population size	Size of market[c]
				(Rural/Urban)[b, c]	Location attractiveness[a]
	Service offerings[b]	Sourcing criteria[e, g]		Income per capita[c]	
				Education[c]	Public policy[b, h]
	Workforce development[b]			Digital divide	
Dependent variables	Financial outcomes	Cost saving[a, b]	Income[a]	Increased purchasing power[a]	Public policy effectiveness[b, h]
		Service Quality[a, b]	Change in household's purchasing power		
	Workforce outcomes[b]	CSR objectivesmet[a]		Healthier community members[a]	
	Double or triple bottom line[d, e, f]	Client satisfaction[a]	Num of people trained	Increase in employment[a]	
			Support family[a]		
			Inclusion	Number of local businesses that benefited as suppliers to the new impact sourcing entities	
			Access to healthcare[a]/ Education[a]		
			Job satisfaction		
			Turnover intention	New behaviors that emerged	
			Changes in self-efficacy, esteem, and image	Influence in public policy	
		Provider portfolio expanded geographically or to new workforces[a]	Changes in personal relationships such as power within the family or community		
			Transformation of lives/ Sustainable livelihoods		

[a] Accenture (2012); [b] Lacity et al. (2012); [c] The Monitor Group/Rockefeller Foundation (2011); [d] Porter and Kramer (2011); [e] Heeks (2012a, b); [f] Ramos and Vaccaro (2012); [g] Babin and Nicholson (2012); [h] Avasant/Rockefeller Foundation (2012)

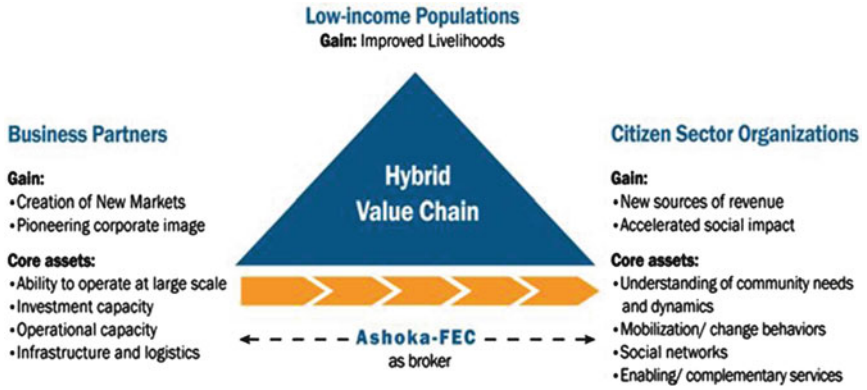


Fig. 1 The Ashoka HVC model (*Source* Ashoka website)

Root Capital is a non-profit social investment fund. It works with poor and environmentally vulnerable areas in Africa and Latin America to deliver technical trainings, financial training, lending capital, and strengthening market connections. It aims to build more sustainable livelihoods by aggregating small businesses in each region (Rootchange.org 2014). Root Capital largely rejects qualitative measures and emphasizes performance through quantitative means.

Measures of lending impacts include: the number of loan disbursements made, the number of household members reached by Root Change programming, the total number of loans, the total number of borrowers, and other lending measures. Business growth is measured, traditionally, by revenues. Training impact is measured by number of businesses trained. Root formulated a concept of "sustainable livelihoods" which is measured by the amount in payments to producers, number of producers reached directly, the number of producers reached indirectly, the number of household members reached by programs. Additionally, gender, inclusion and the environment are measured quantitatively. Environmental impact is measured through the number of hectares under sustainable cultivation.

Root measures quantitatively how much households were able to buy before and after intervention. This is consistent with anecdotes we authors have heard about impact sourcing's immediate impact: the ability of a household to acquire a capital good or to investment in human capital (education) for one of its members.

3.2 Other Approaches

The United Kingdom's Department for International Development (Stern et al. 2012) stated that it is important to identify the proper causal pattern in development. Impact sourcing is the cause (or intervention) with multiple associated outcomes: improving livelihoods, building skills and capacity, increasing incomes. Impact sourcing will likely have effects at the household level, the community

level, and the national level. Technology transfer and knowledge transfer will occur, strengthening local and national capacity. Jobs will be created, providing access to capital for poor families, and increasing incomes.

Heeks and Arun (2010) identify three levels of impact: outputs (short term, immediate effects), development outcomes (longer-term effects), and development goals (the ends of a program) that can be expected to come from impact sourcing activities. These outputs, outcomes and goals are at the national level, looking at impacts country-wide that will result from impact sourcing.

Outputs are the immediate benefits of a development program or intervention. Outcomes are longer-term benefits. Governments will benefit from new factories, new investments, contracts and jobs for their citizens. Softer measures include such benefits as, "how efficiently a project is run, how accurately it can stay on schedule and whether a failing project is discontinued before undue investment in it is made." Lorenzetti (2002) as well as increased employee morale and greater satisfaction from work.

The highest level of impact is the level called *development impacts*—goals or strategic objectives in a standard international development logic model (PMD Pro Guide 2010). Heeks and Arun (2010), posit that the strategic object that could be reached as a result of impact sourcing is meeting one of the Millennium Development Goals (MDGs).

4 The Research Framework

The impact sourcing ecosystem comprises four key stakeholders: impact sourcers, clients, employees, and communities (Accenture 2012). Our research framework examines the key constructs relevant to each stakeholder and proposes a number of dependent variables to measure the effects of impact sourcing on these groups (see Table 1). The framework also includes important global and government issues relevant to impact sourcing. Pertaining to the dependent variables, we ask again: What is impact? Impact is defined by the OECD-DAC as, "positive and negative, primary and secondary long-term effects produced by a development intervention, directly or indirectly, intended or unintended." (OECD-DAC in Stern et al. 2012) Additionally, the World Bank defines impact as, "… assessing changes in the wellbeing of individuals, households, communities or firms that can be attributed to a particular project, program, or policy." (The World Bank in Stern et al. 2012). These definitions provide a broad understanding of how impact sourcing can be assessed.

4.1 Impact Sourcers

Impact sourcing is defined as a *practice,* but the practice is enacted by an entity and thus implies an impact sourcer, which we define as:

> Impact Sourcer: An organization that employs marginalized individuals to provide information technology, business process or other digitally-enabled services who normally would have few opportunities for good employment.

Much of the empirical work on impact sourcing has focused on case studies of impact sourcers, including those listed in Table 2. Case studies describe the history of the impact sourcers, service offerings (IT, BP or other services like microwork), and workforce development strategies.

4.1.1 Business Models

A key construct is the business model used by each impact sourcer. Business models largely deal with the degree of intermediation between the impact sourcing client and the end-point employees. We note that from a competitive perspective, impact sourcing effects industry strategy and the competitive landscape within the intermediaries that provide impact sourcing. The basic business models are highly dependent on intermediaries as a channel for managing the employees and the tasks. Business model classifications have been developed by The Monitor Group/ Rockefeller Foundation (2011) and Accenture (2012). The Monitor Group/ Rockefeller Foundation (2011) identified five business models: Micro-distribution, Intermediary, Subcontractor, Partner, and Direct (see Table 3).

Micro-distribution: The Impact Sourcer ("IS") (called the IS Intermediary/ Service Provider in Table 3) acts as an intermediary that takes large tasks from clients and breaks them into micro tasks and distributes work to remotely located workers. As described previously, when we introduced microwork, most such cases use distributed freelancers.

Intermediary: This model involves two impact sourcers. The Impact Sourcer Intermediary serves as the client-facing sales office, quality control check, and work distributor. The Impact Sourcer Service providers focus on service delivery. Samasource is an example.

Subcontract Model: An established BPO provider outsources part or all of long-term contracts to IS centers that work exclusively for them. Avasant/ Rockefeller Foundation (2012) cites Paradigm Express an example of an IS service provider that gets it work from the established Paradigm Infotech in India.

Partner Model: This model is similar to the intermediary model except that the IS Intermediary acts as a parent to the center partners. RuralShores is an example.

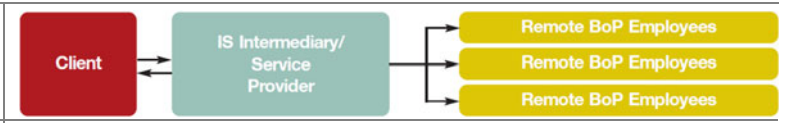
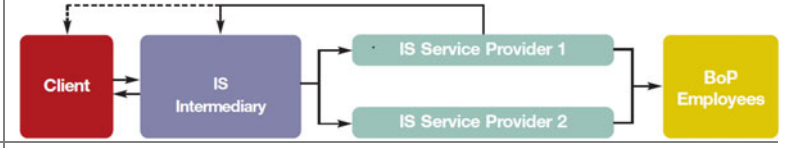
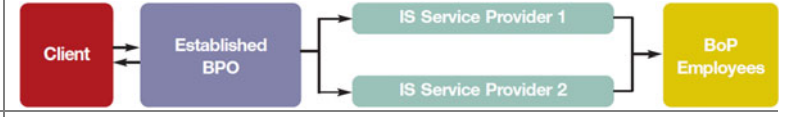
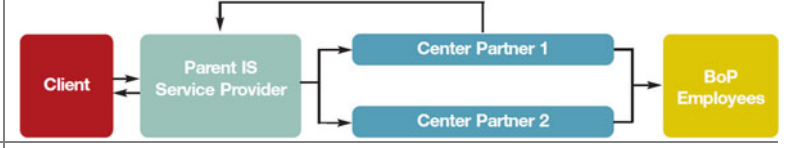
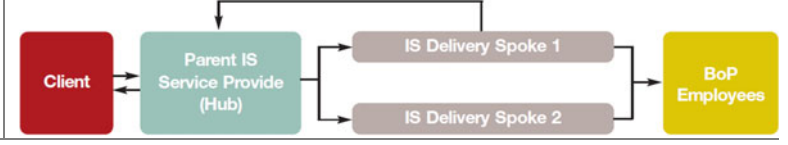
Direct Model: This model is described as a hub and spoke model in which the parent IS provider builds spoke IS delivery centers as needed to meet client demand. According to The Monitor Group/Rockefeller Foundation (2011), DDD is an example.

Accenture (2012) offers a simpler classification than the Rockefeller Foundation of impact sourcing business models. Accenture distinguishes between the prime contractor and subcontractor models (see Fig. 2). With the prime contractor model, an established outsourcing firm owns the outsourcing contract, interacts

Table 2 Sample Case Studies of Impact Sourcers

Impact sourcer	Founded	Targeted marginalized individuals	Primary services	Location	Case study references
Cayuse technologies	2006	Native Americans	ITO (~35 %) BPO (~65 %)	Reservation of the Confederated Tribe of the Umatilla Indian Reservation near Pendleton Oregon (USA)	Accenture (2012), Lacity et al. (2012)
Digital divide data	2001	Unemployed high school graduates ready for work/study program	BPO	Cambodia, Laos, Kenya	Accenture (2012)
Maharishi institute	n/a	Disadvantaged populations with high school diploma	BPO	Johannesburg, South Africa	Accenture (2012)
Matrix global	2004	Ultraorthodox "haredi" Jewish women	ITO	Modi'in, Israel	Lacity et al. (2012)
Onshore outsourcing	2005	"No-collar" individuals in rural community	ITO	Macon, Missouri (USA)	Lacity et al. (2010, 2012)
RuralShores	2008	Disadvantaged populations	BPO	Multiple centers in rural India	The Monitor Group/Rockefeller Foundation (2011)
Samasource	2008	Bottom of the pyramid	BPO (microwork)	Headquarters in San Francisco, 16 delivery centers with partners in Haiti, Kenya, India, Cameroon, Zambia, Uganda	Gino and Staats (2012), Lacity et al. (2012), The Monitor Group/ Rockefeller Foundation (2011)
TechnoBrain	n/a	Poor and vulnerable populations	ITO BPO	Nairobi, Kenya, Uganda	Accenture (2012)
TxtEagle	n/a	Urban workers with high school education	BPO (microwork)	China, India, Latin America, Southeast Asia, Africa	The Monitor Group/Rockefeller Foundation (2011)

Table 3 Five impact sourcing business models

Micro distribution	
Intermediary	
Subcontract	
Partner	
Direct	

Source The Monitor Group/Rockefeller Foundation (2011)

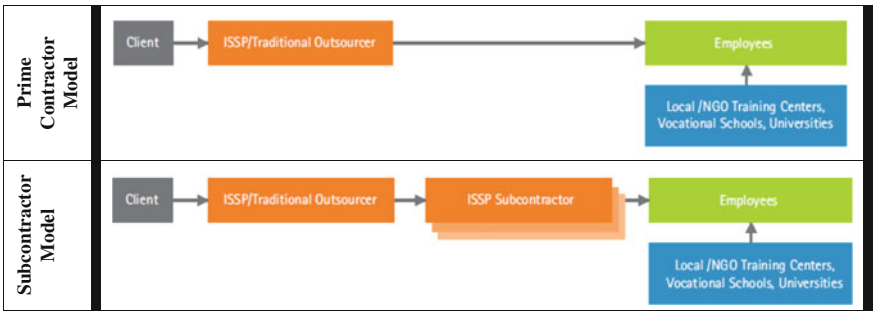


Fig. 2 Two impact sourcing business models (*Source* Accenture 2012)

with the client, and owns or part-owns the delivery center that employees the workers from "disadvantaged" populations. With the subcontractor model, the established outsourcing firm owns the outsourcing contract and interacts with the client, but a subcontractor delivers the service and performs the day-to-day service. Accenture also recognizes that these models are not mutually exclusive because established outsourcing firms operate in complex environments and often multiple contracts are being delivered that have different commercial terms.

4.1.2 Service Offerings

To distinguish impact sourcing from the broader category of Bottom-of-the Pyramid sourcing, we focused the definition of impact sourcing on **information technology**, **business process**, or **other digitally enabled services**. This captures a wide spectrum of task complexity, ranging from the microwork to the complex tasks of developing software at Matrix Global, Cayuse Technologies, and Onshore Outsourcing described by Lacity et al. (2012). Digital services include work that involves data, such as verifying phone numbers on websites, transcribing handwritten or voice inputs, and data entry. Business process services include call center work, drafting documents, processing forms, building reports, maintaining content, and coding services. Information technology services include coding, testing, building (e.g., websites), data conversion, platform conversion, user documentation, and technical documentation.

From preliminary evidence, the service offerings of impact sourcers are ever evolving. At US-based Cayuse Technologies, the firm initially focused on IT services, but by 2012, 65 % of the business is devoted to business process services. At Onshore Outsourcing, the service offerings have expanded and the major source of revenues have shifted from web development, to .NET development to application maintenance (Lacity et al. 2012). The CEO said to us in 2013 that increasingly, Onshore Outsourcing's service offerings are moving "from build [systems] to run [systems]".

4.1.3 Workforce Development Strategies

Impact sourcers pursue strategies for recruiting, training, on-boarding, and developing employees. Lacity et al. (2012) examined these practices for a number of impact sourcers, including Cayuse Technologies, Samasource, and Matrix Global. From the limited empirical data, most impact sourcers seem to recruit locally where the targeted marginalized individuals reside. Local recruitment practices include job fairs, advertising, word-of-mouth, and employee referral. Some impact sourcers use psychological tests to assess stability, maturity, and emotional intelligence. For more advanced IT services, aptitude tests may be used to assess problem solving skills, logical reasoning, and the ability to diagram.

Depending on the complexity of work, impact sourcers use on-the-job training, boot camps, subsidized two-year technical college training, and/or work-study programs. Impact sourcers may initially hire employees as "interns" before committing long-term to an employee. From several case studies, marginalized employees who are trained and employed seem highly appreciative and satisfied at first. However, most human beings need to be constantly challenged, and creating career paths for employees became an issue for several impact sourcers studied (Lacity et al. 2012). Employees from two case studies also became dissatisfied with their pay when they compared their salaries with other people performing similar work in more established provider organizations. For impact sourcers, workforce development strategies must evolve and adapt.

Some preliminary evidence also suggests that although turnover of impact sources is quite low—around 3–7 % in case studies, absenteeism can be quite high (Lacity et al. 2012). Marginalized individuals may not have access to day care, adult care, transportation, or other support community support services than enable steady attendance.

4.1.4 The Dependent Variables for Impact Sourcers

What is the impact of impact sourcing on the impact sourcers? Another way to ask this question is "How is success defined and measured for impact sourcers?" As a provider of services, traditional financial measures of success apply, including revenue, profitability, return on investment, and market growth. Prahalad (2004) points out that the Bottom of the Pyramid opens up a large market potential and should therefore be financially beneficial to corporations. For example, his cases demonstrate profitability and strong Return on Equity. Client satisfaction, repeat business, and positive client referrals might also be important surrogates of impact. As an employer, measures of turnover, absenteeism, and employee satisfaction could also indicate success.

But as impact providers, success should also include some measures relevant to the social mission of the firm. For example, impact sourcers aim to recruit and train marginalized individuals, but their entire workforce will comprise a mix of professional and marginalized individuals. Cayuse Technologies, for example,

employed 280 people in 2011, of which 54 were tribal members (19 %). Accenture (2012) further measured outcomes for Cayuse Technologies by tracking number of incremental tribal employees trained, jobs created, and total number of tribe members employed over a three year period from 2009 to 2011. For impact sourcers, we see that tracking these measures can serve as indicators of the impact of impact sourcing.

Outside the few research articles targeted at impact sourcing specifically, the strategy literature has studied the societal impacts of the firm (Ramos and Vaccaro 2012). Ramos and Vaccaro (2012), for example, examine the social enterprise which is a blend between a pure profit making enterprise and a non-for-profit. This hybrid entity is useful because some of the impact sourcing firms take on characteristics of social enterprises. Their purpose is to "achieve a social mission and financial profitability" both their measure of performance and accountability is the ***double bottom line*** of financial and social indicators. Porter and Kramer (2006) discuss how firms should choose CSR projects, calling for the strategic targeting of corporate social responsibility at the firm level. But more pertinent to impact sourcing is the follow-up piece about Creating Shared Value (CSV) at the firm level Porter and Kramer (2011). The authors argue that creating shared value should supersede corporate social responsibility (CSR) in guiding how firms should support communities. Whereas CSR only focuses on the benefits, CSV focuses on the overall economic and social benefits relative to cost. The concept of CSV could relate to impact sourcers, particularly for impact sourcers supported by tax abatements, government funding for training, or wage subsidies. The overall value that impact sourcers generate should consider these costs.

Other authors have argued for a **triple bottom line**: economic, ecological, and social impacts (Elkington 1995, 1997; Savitz and Weber 2006). For Elkington (1997), the triple bottom line refers to the fair and beneficial treatment of **people**, sustainable environmental practices to protect the **planet**, and economic value captured as **profit**. Heeks (2012a, b) is the first author, we believe, to apply the idea of the triple bottom line as an output measure of impact sourcing.

4.1.5 Research Questions About Impact Sourcers

Several publications have addressed key constructs pertaining to impact sourcers, including business models, service offerings, and workforce development (Accenture 2012; Gino and Staats 2012; Lacity et al. 2012; The Monitor Group/Rockefeller Foundation 2011; Avasant/Rockefeller Foundation 2012). As expected from an emerging phenomenon, the research thus far has focused on descriptive case studies and identifying key constructs. The full population of impact sourcers has yet to been identified, and we still need basic data on the number and types of impact sourcers across the globe. We also do not know how successful the population of impact sourcers is as related to any of the dependent variables. There is also little research that yet attempts to assess how key constructs affect the dependent variables described above. Because so many of these

impact sourcers are new, longitudinal case studies would help us understand better how business models, service offering, and workforce development strategies emerge over time and how these changes affect outcomes. Thus, we posit that the following research questions pertaining to impact sourcers are worth investigating:

- How many impact sourcers exist worldwide?
- What percentage of impact sourcers are successful in terms of economic, social, and or environmental outcomes?
- How do impact sourcers' business models, service offerings, and workforce development strategies affect outcomes?
- How do impact sourcers' business models, service offerings, and workforce development strategies evolve over time?

4.2 Impact Sourcing Clients

We next discuss impact sourcing clients, i.e., the buyers of impact sourcing services. The client's value proposition for wanting to buy services from impact sourcers and the inclusion of ethical/social criteria in sourcing evaluations are discussed in this section.

4.2.1 The Value Proposition

A value proposition is "a promise of value to be delivered and a belief from the customer that value will be experienced" (Wikipedia). According to Accenture (2012), the value proposition for impact sourcing is strong. Besides helping disadvantaged individuals, clients have an opportunity to positively impact their growth objectives and internal CSR agenda. Accenture (2012) notes, however, that CSR contributions are superseded by a client's business reasons for outsourcing; costs, quality, freeing up strategic company resources and global expansion priorities come before CSR objectives. Accenture (2012) depicts the value proposition of impact sourcing in Fig. 3.

Lacity et al. (2012) assessed the client value proposition using interviews with impact sourcers and their clients. Impact sourcers in the study aim to make the world a better place by employing marginalized populations. At OO, founder Shane Mayes aims to give "no collar" rural people better lives. At Cayuse Technologies, tribal leaders aim to diversify their economic base beyond casino gaming, fishing, and agriculture. At Matrix Global, the founder of the subsidiary aimed to provide good jobs for ultra-religious women who had few opportunities for good employment close to home. At Samasource, founder Leila Chirayath Janah aims to end poverty in the digital age. Impact sourcing providers, however, did not prophesize their social missions to clients; they sell clients good services at a good price. The clients we interviewed bought services from impact sourcers

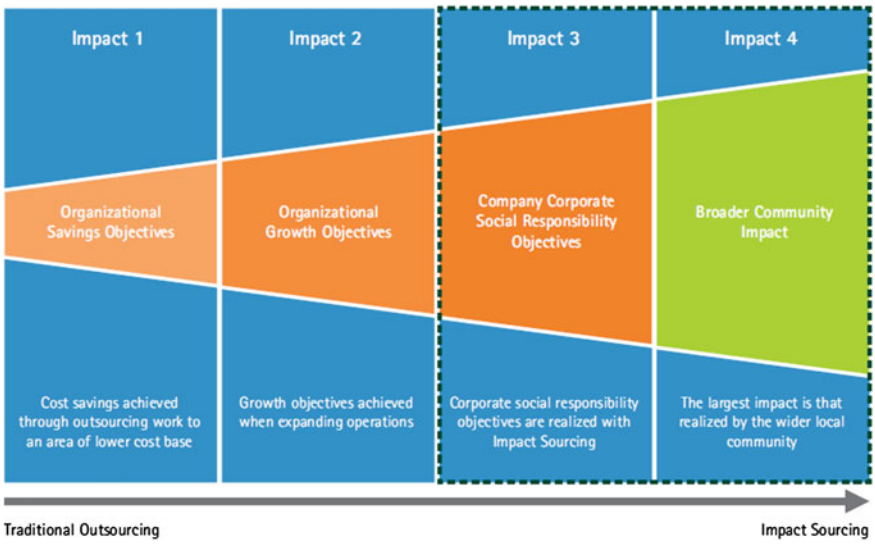


Fig. 3 Accenture's view of impact sourcing's value proposition (*Source* Accenture 2012)

based firstly on price and quality of services. Some clients additionally said that hiring the impact sourcer helped to meet corporate social responsibility objectives, such as buying a certain amount of services each year from minority-owned businesses. Of course, the value proposition for individual clients vary, as some buyers cited low cost, ease of doing business, nationalism, corporate social responsibility (CSR), and low turnover as part of the value proposition of their impact sourcing engagements.

4.2.2 Sourcing Criteria

What criteria do clients use to assess impact sourcing as a sourcing option? There is very little research on this specific topic other than Accenture (2012). Accenture's survey asked respondents, "Once the cost and quality expectations have been met, which criteria are most important for evaluating impact sourcing?" Risk, infrastructure reliability, and economic stability were the top three criteria after cost and quality (see Fig. 4).

The Accenture (2012) survey also found that clients who operate and sell their products and services in Africa and the Middle East are more likely to participate in impact sourcing. Client firms, however, identified a number of barriers that needed to be overcome in order for them to consider impact sourcing. The top five barriers were security, language skill availability, infrastructure reliability, experience, and regional stability.

In the broader and global ITO and BPO markets, researchers have examined sourcing criteria that include ethical, social, environmental, and sustainability

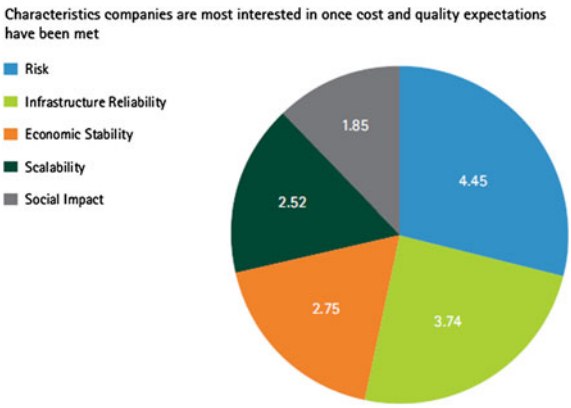


Fig. 4 Criteria for impact sourcing (*Source* Accenture 2012)

criteria (Babin 2008; Babin and Nicholson 2012; Park and Hollinshead 2011; Pratt 2008). Most of these sourcing criteria are used by larger client firms to assess large global ITO and BPO providers. At this stage in the impact sourcing journey, these terms are therefore only tangentially relevant. For sake of comprehensiveness, we discuss these terms below but conclude that the concept of ***social outsourcing*** is the most relevant sourcing criteria for impact sourcing (Heeks and Arun 2010).

The essential idea behind CSR considerations in outsourcing decisions, socially responsible outsourcing, ethical outsourcing, and sustainable global outsourcing is that client firms need to consider more than costs, service quality, and risks when selecting outsourcing providers. Since the first publications on this topic in 2008, considerable client interest in and provider adoption of ethical, social, and environmental responsibly has increased.

CSR considerations in outsourcing decisions. Babin (2008) asked the question, "How do clients view CSR in IT Outsourcing?" Although only ten people responded to the survey, this is one of the first pieces of research that addresses this question. Babin found that CSR was not an issue in the 2008 outsourcing environment—but that it would be in the future.

Socially Responsible Outsourcing (SRO). Socially responsible outsourcing is the responsibility of an organization (clients and providers) for the impacts of its decisions and activities on society through transparent and ethical behavior (Hefley 2009; Heeks 2012a, b). The CEO of Digital Divide Data defined socially responsible outsourcing as "an outsourcing model that operates strategically to yield social benefits in addition to its traditional commercial revenues" (Babin and Hefley 2009, p. 9). Babin and Nicholson (2012) conducted three surveys, each of which asked whether clients would outsource to developing regions of the world as an act of social responsibility. In the NAO survey of 32 respondents, 42 % would not consider outsourcing as a social responsibility. In the IAOP survey of 166 respondents, 58 % indicated they would never or rarely outsource because of SRO. In the CORE survey of 44 Canadian practitioners, the percentage was 75 %. In a follow-up question on the IAOP survey, the authors asked respondents to what

degree would they follow SRO guideline if the IAOP were to adopt them. Eight-five percent of respondents said they would either completely or partially follow a set of SRO guidelines.

Ethical outsourcing. Park and Hollinshead (2011) define ethical outsourcing broadly as "outsourcing based on ethical guidelines and principles". Their principles take into consideration employees in the US (ensuring that contractors are laid off first if necessary, rather than employees) as well as their counterparts overseas.

Sustainable global outsourcing. Babin and Nicholson (2012) describe sustainable global outsourcing as a client's sourcing objective to require providers to meet their sustainability expectations. The authors cite Wal-Mart as an example. Wal-Mart introduced environmental criteria to assess its 100,000 suppliers worldwide and requires environmental reporting.

All researchers cited above urge clients to consider ethical, social, and environmental criteria in their sourcing evaluations. For providers, the implications are even greater. Providers must not only develop actual ethical, social, and environmental competencies, they must be able to demonstrate these competencies to potential clients. Large global providers, for example, may pursue certain certifications to demonstrate their "greenness" or their "social responsibility", including GRI (sustainability index), ISO 14001 (environmental management specifications), ISO 26000 (social responsibility standard), The Dow Jones Sustainability Index, and FTSE4Good Index. Porter and Kramer (2006) are very skeptical of these indices as many rely on company self-reported data. As these standards and indices apply to information technology providers, Babin and Nicholson (2011) rated the top 24 providers—all large global providers like Accenture, IBM, CapGemini, TCS and Wipro. Will impact sourcers need to adopt these sophisticated standards to attract clients?

As far as sourcing criteria for impact sourcing, the concept of social outsourcing seems most relevant:

Social Outsourcing. Heeks and Arun (2010) define social outsourcing as the contracting out of goods or services to social enterprises. They examined how the government of Kerala, a state within India, outsourced IT services to cooperatives of women from below-poverty line families. Their paper is one of the few that address the impacts of impact sourcing on the marginalized workers, but we are also interested in this research from a client perspective—the reasons why the client (in this case the government) selected social outsourcing, which aimed for a triple win of enriching a disadvantaged group in society, saving money, and delivering on neo-liberal, good-government, and developmental political agendas.

4.2.3 The Dependent Variables for Clients

A client manager's main fiduciary duty is to act in the best interests of his/her shareholders by efficiently and effectively managing the firm's resources. As such, clients should select outsourcing providers based on overall value by primarily

considering **costs** and **service quality**. We therefore argue that these are the main dependent variables that should be used to assess the impact of impact sourcing on clients. In addition, other dependent variables might include **the degree to which CSR objectives were met, the level of client satisfaction**, and the **degree to which the impact sourcing engagement enhances the client's global sourcing portfolio** by accessing new geographies or new workforces (Accenture 2012; Babin and Nicholson 2012; Lacity et al. 2012).

Other dependent variables also could be assessed. Returning to Cayuse Technologies as an example, Accenture measured a telecom client's impact of engaging Cayuse Technologies from the period 2009 to 2011. The measures that improved over time include: percentage of cost savings objectives achieved (from 47 % in 2009 to 100 % in 2011), total employee giving, total employee health care, total workforce diversity (increase in percentage of women and people of color). Only one measure decreased over time, the total giving to local communities.

4.2.4 Research Questions for Clients

As an emerging market, many clients may still be unaware of impact sourcing as a viable option. Thus repeated surveys of potential and actual impact sourcing clients are warranted. Research questions include:

- Under what circumstances do clients consider impact sourcing a viable sourcing alternative?
- What sourcing criteria do clients use to assess impact sourcing and impact sourcers?
- Do clients expect impact sourcers to compete with traditional ITO/BPO providers or are assessments separated?
- What are the anticipated and actual effects of impact sourcing engagements on client firms?
- To what extent do best practices[3] from engaging traditional providers apply to impact sourcers?

4.3 Impact Sourcing Employees

Based on our review of the existing work on impact sourcing, we find that the greatest knowledge gap in studies of those marginalized individuals targeted for employment by impact sourcers—and the actual effects that impact sourcing has on these individuals. The case studies in Table 2 include some interviews with employees of impact sourcers, but no detailed analyses of the actual effects of

[3] Best practices include contractual governance, relational governance, client capabilities, and provider capabilities (Lacity et al. 2011).

impact sourcing on employees were presented in these case studies. In this section, we focus on examples of marginalized populations and suggest how researchers might go about assessing the effects of impact sourcing on these individuals.

4.3.1 Marginalized Populations

Marginalized individuals are individuals relegated or confined to a lower or outer limit or edge of social standing. As many organizations and researchers have noted, poverty is a primary attribute of many marginalized individuals. The United Nations Development Program (UNDP 2008) defines marginalized: "[women], the young, the elderly, the impoverished and homeless, the disabled, and those of different sexual orientations." The Food and Agricultural Organization (FAO 2004) extends this definition by including, "Small subsistence farmers, women, youth in urban and rural areas, indigenous people, nomads, mountain people, refugees, landless labourers, rural artisans, small fishermen, inhabitants of small islands… migrant workers, Diasporas, victims of AIDS, the disabled, and victims of war and conflict situations."

Impact sourcing firms must conduct their analyses and draw up their contracts with the intent of targeting these marginalized groups. Chamber (2008) cautions about *bias* that draws development projects away from marginalized groups. The most salient of these biases are spatial and person. The spatial bias draw development projects to target cities and towns with infrastructure already in place, leaving underdeveloped to remain drastically underdeveloped and overdeveloped areas to continue receiving funds and attention. The person bias favors prominent males in poor communities rather than entire populations.

An important aspect of evaluating impact is assuring that impact is measured in all relevant groups of beneficiaries. The difficulty of doing so is that often the most marginalized populations are the most difficult to locate, the least likely to benefit from development projects and the least visible. As impact sourcing is a phenomenon of the 2010s, it has the opportunity now, at its outset, to make a sincere effort to include marginalized populations.

Below we describe some examples of such marginalized populations.

Native Americans. Native American is a term used to describe indigenous populations of tribes that preceded European immigration. There are approximately 1.4 million Native Americans, 64,103 Alaskan Natives, including Eskimos, American Indians, and Aleuts. About half of the Native American population lives on reservations. Among the 300 plus federal and state reservations, all reservations are located in remote areas and all but two have populations of less than 10,000. Income, employment, and graduation rates on reservations are considerably lower than national averages.[4] In the United States, Congress passed the Indian Gaming

[4] http://rtc.ruralinstitute.umt.edu/indian/nativeil.htm; http://en.wikipedia.org/wiki/Reservation_poverty

Regulatory Act of 1988, which recognized the right of Native American tribes to establish gambling and gaming facilities on their reservations. Since then, gaming has been the main source of employment and economic development for many tribes, along with fishing and agriculture. Impact sourcing promises to offer this population much better employment opportunities. Cayuse Technologies, for example, was founded in 2006 and is owned by the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) of the northeast region of Oregon. The idea for the company came from Randy Willis—an Accenture executive and a Lakota tribe member—when he was visiting friends on the reservation. Willis knew that the reservation, with 17 % unemployment, needed opportunities for employment beyond the Wildhorse Hotel and Casino (Lacity et al. 2011). Another source claims the unemployment rate was 35 % before Cayuse Technologies was founded and dropped to 15 % by 2011(Accenture 2012).

Prisoners. Perhaps no other workforce is more marginalized than those in prison (Lacity et al. 2012). Able-bodied and able-minded prisoners have always worked—at least in the United States—to defray the costs of "corrections" and to meaningfully occupy prisoners. Most prisoners, after all, will one day be released. Research in the US found that prisoner work participation is associated with lower recidivism rates, higher rates of employment in half way houses and higher wages after release compared to prisoners who were not these programs (e.g., Conan 2010; James 2007; Saylor and Gaes 1997, 2001). Most prison employment programs train workers in manual tasks, such as furniture building or textiles. But with the advent of the Internet, some prison employment programs now train prisoners to perform low-level BPO services like call center work. For example, the Federal Correctional Institution (FCI) in Elkton, Ohio has 450 computers in a center on the prison compound where trained prisoners provide business services to external customers. Another example is the all-female state prison at the Arizona State Prison Complex in Perryville Arizona. This site serves as an example of a private sector partnership. Televerde, the private sector partner, operates four call centers at that location. Its external customers include Cisco, Hitachi, and SAP (Barret 2010).

Ultra-orthodox "haredi" Jewish women. Haredi is the Hebrew word for one "in awe of god." In religious taxonomies this group may labeled as fundamentalist or ultra-orthodox. The communities are self-segregated, highly patriarchal, and have low household income since often both the husband and wife do not work. In Israel, these women represent about 5 % of the potential labor pool. Israeli firms, like their American counterparts, had some sour experiences with offshoring. In response, Matrix Global, an Israeli IT services firm, looked inside the country and became the leader in sourcing labor from inexpensive haredi population. The Israel-based haredi division was founded in 2004, with its main center housed in modern, well-equipped offices a distance of one half hour drive from the center of Tel Aviv. The division has been quite successful—it grew quickly, reaching 600 women by 2010 and 850 women by 2012. In the hallways and cubicles of this firm one finds only women wearing religiously-conservative attire of long skirts, long sleeves, and head coverings. As stated in the firm's website "… These highly

educated, carefully selected, and meticulously trained women have very strict and specific social and community needs. By satisfying these needs and establishing the development centers in the midst of their religious community, Matrix Global has tapped into a high-quality workforce available in substantial numbers at competitive rates. The homogeneous religious environment of the development centers has enabled the formation of a pool of qualified technical personnel with a high degree of loyalty and professionalism."

4.3.2 The Dependent Variables for Employees

The Monitor Group/Rockefeller Foundation report (2011), in all its careful detail, is also brief about the impact itself. It notes that an impact sourcing "[…] facility will create higher-income job opportunities for otherwise disadvantaged populations whether it is based in downtown Detroit, a slum area in Sao Paolo or a rural village in India" thus, it is higher income than would otherwise occur that happen. Later the report repeats this point: "[…] Impact Sourcing employment provides measurable increases in income levels. Data suggests that Impact Sourcing employees benefit from income increases between 40 and 200 %. In addition to the benefits of formal, stable employment" the report then adds one more important variable: "our research suggests that IS employment also increases family investment in health care and education." Nevertheless, the international development literature is cautious about relying too heavily on income as an impact variable because this can hide persistent inequity, even after the end of an "intervention." We propose that there are many dependent variables that can measure the impact of impact sourcing on employees. These include: access to healthcare, access to education, work-life balance, self-esteem, self-image, self-efficacy, job satisfaction, and turnover intention.

4.3.3 Research Questions for Employees

Research questions include:

- How do marginalized employees become engaged in impact sourcing?
- How does employment impact employees' power and position with their families? Within their communities?
- How does their self-efficacy, self-esteem, and self-image change as a result of employment?
- How satisfied are they with their jobs? How does job satisfaction change over time? Are the determinants of job satisfaction the same for impact employees as non-impact employees?
- What are their turnover intentions? Are the determinants of turnover intentions the same for impact employees as non-impact employees?

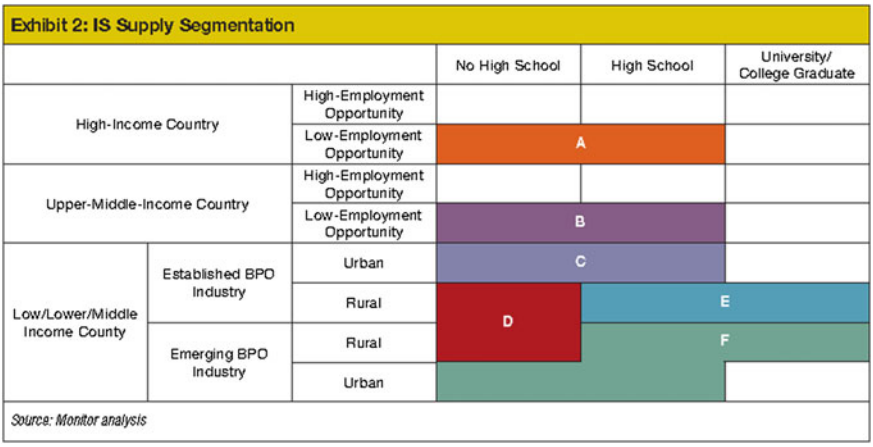


Fig. 5 Impact sourcing segmentation (*Source* The Monitor Group/Rockefeller Foundation 2011)

4.4 Communities

The community population size and its type (Urban/Rural) is important to examine. Most impact sourcing is outside of the major cities, sometimes very far. Rural sourcing is a term popular in the USA, which we have not observed as a term, in non-English speaking nations. This approach offers clients a workforce in small towns in America's heartland. Clients want an alternative to expensive part-time contractors and the frustrating relationships with offshore providers. Rural sourcing in the United States has been primarily a location strategy. A formal definition is provided by Lacity, Rottman and Khan (2010): Rural sourcing is the practice of locating delivery centers in low-cost, non-urban areas.

Regarding the type of population we ask: What population demographics are being tapped? One variable is the education level. The Rockefeller Foundation later admits that the boundaries of impact sourcing are unspecified, and suggest that even employing college-educated people in rural areas counts as impact sourcing. They define six types of impact sourcing based on a country's income and on the education level of the target employees (see Fig. 5).

4.4.1 Dependent Variables

From three international development organizations we surveyed in Sect. 3, we well as other sources, we list variables which are important

- Increased Purchasing Power
- Healthier community members
- Increase in employment

- Number of local businesses that benefited as suppliers to the new impact sourcing entities
- New behaviors that emerged
- Influence in public policy.

4.4.2 The Research Questions for Communities

- In what way has the community improved its human capital and its financial capital?
- How has the culture of work change in the community?
- How has the community become more pluralistic and tolerant?
- How have the firms and the newly empowered employees affected public/government institutions?

4.5 Global and Government Issues

Besides the impact of impact sourcing on the four primary stakeholders—impact sourcers, clients, employees, and communities, we submit that the research domain should include a number of global issues: market size, public policy aspects of supporting impact sourcing.

4.5.1 Size of Market

Size of market figures presumably capture the total revenue generated by all the providers operating within an industry. Across all sourcing markets, several key advisory organizations regularly size outsourcing markets. For ITO and BPO, Gartner is the most cited source for size of market figures and estimates of market growth. In 2013, Gartner estimates the global ITO and BPO market to be worth $531 billion and growing at 4.31 % annually (see Fig. 6). This annual growth rate is much lower than prior estimates for annual growth rates, which have been over 10 % annually for ITO and 25 % for BPO (Cuoto and Ashok 2006).

In the impact sourcing space, The Monitor Group/Rockefeller Foundation (2011) estimated the overall size of the impact sourcing market to be worth $4.5 billion in 2011. This figure represents about 4 % of the overall $119 billion BPO market (according to this source). It projected that by 2015, the impact sourcing market would be worth $20 billion world-wide. The Monitor Group/Rockefeller Foundation (2011) also sized different parts of the global impact sourcing market based on their impact sourcing segmentation (see Fig. 7). The largest segment, capturing 44 % of the impact sourcing market, is urban locations within an established BPO industry within a low to lower-middle income country.

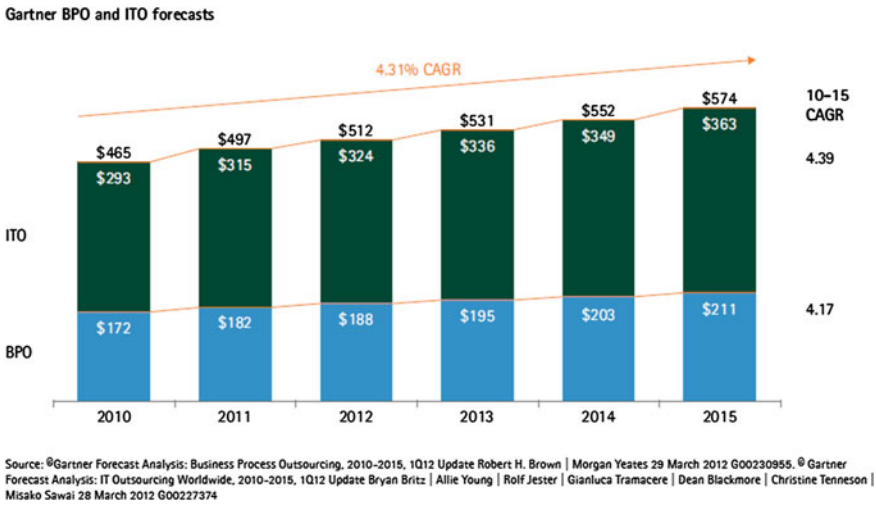


Fig. 6 Size of global ITO and BPO markets (*Source* Accenture 2012)

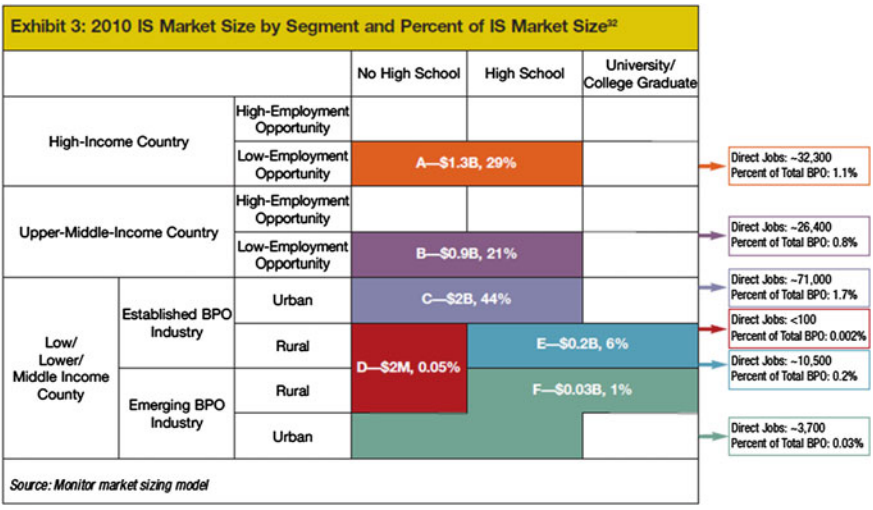


Fig. 7 Size of impact sourcing market by segment (*Source* The Monitor Group/Rockefeller Foundation 2011)

In Avasant/Rockefeller Foundation (2012), in cooperation with Avasant, the market sizes for impact sourcing were adjusted even higher. "Avasant's recent research and data collection indicate that the current size of the impact sourcing market appears to be substantially larger than earlier estimates." (Rockefeller Foundation 2012, p. 7). Impact sourcing, the publication claims, comprises 10 % of the global BPO market and employs nearly 560,850 people world-wide.

4.5.2 Location Attractiveness

From which locations would clients consider buying services from impact sourcers? Which locations are most attractive for impact sourcing? Accenture (2012) conducted a location analysis based on barriers to entry (from survey and interview data), five costs (labor, training, infrastructure, facility, and taxes), and a risk profile based on 14 secondary sources including the networked readiness index, ease of access index, index of economic freedom, human development index, ease of doing business rank, corruption perception index, gross domestic product, English language availability, higher education and training, government readiness index, as well as several others. Based on a weighted average of these inputs, Accenture ranked the location "favorability" for impact sourcing (see Fig. 8). Urban India receives the highest rank, followed by urban Egypt, urban Ghana, urban South Africa, and rural United States.

4.5.3 Public Policy

Governments also have a significant role to play through public policies that support impact sourcing. Public policies that support impact sourcing include financial grants for setup, tax incentives on earnings, tax incentives on procurement, hiring incentives and grants, training incentives and grants, subsidies on telecommunications and electricity, subsidies on land and buildings, developing the ICT infrastructure, government sourcing (awarding government contracts to impact sourcers) (Heeks and Arun 2010; Lacity et al. 2012; Rockefeller Foundation 2012).

Lacity et al. (2012) asked some economic development officials and CEOs of impact sourcers to discuss the types and effectiveness of public policies that aim to help impact sourcing. The providers we studied have different views on seeking city, state, and federal government support. On the one hand, a CEO told us, "I wasn't going to build a business by waiting around for a government check." On the other hand, several CEOs benefited from On the Job Training (OJT) funds, Community Development Block grants, property tax waivers or abatements.

Avasant/Rockefeller Foundation (2012) surveyed 71 people with impact sourcing expertise from three categories:

- (S) service providers (impact sourcers and large ITO or BPO providers),
- (I) IPAs, trade bodies & experts,
- (G) government organizations.

The survey asked respondents to indicate the effectiveness of nine public policies intended to promote impact sourcing (see Fig. 9). Clearly, stakeholders hold differing perceptions as to the effectiveness. Service providers don't rate any of these as "very effective" policies. IPAs, trade bodies and experts thought training incentives and grants, development of the ICT infrastructure, awarding government contracts, and hiring incentives and grants were very effective. Government

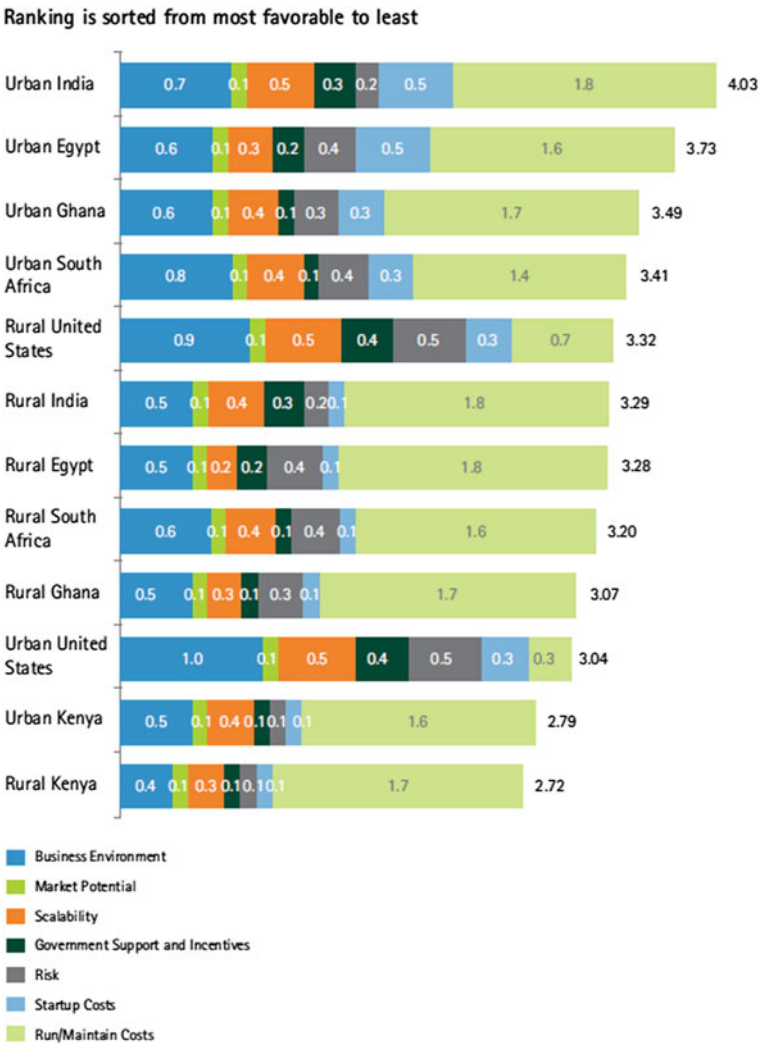


Fig. 8 Location favorability for impact sourcing (*Source* Accenture 2012)

respondents rated hiring incentives and grants and training incentives and grants as the most effective policies.

4.5.4 Research Questions About Global Issues and Public Policy

We note that methods for sizing markets are not revealed by most advisory and we believe it is worthwhile for academic researchers to focus attention on the actual size of impact sourcing. Questions include:

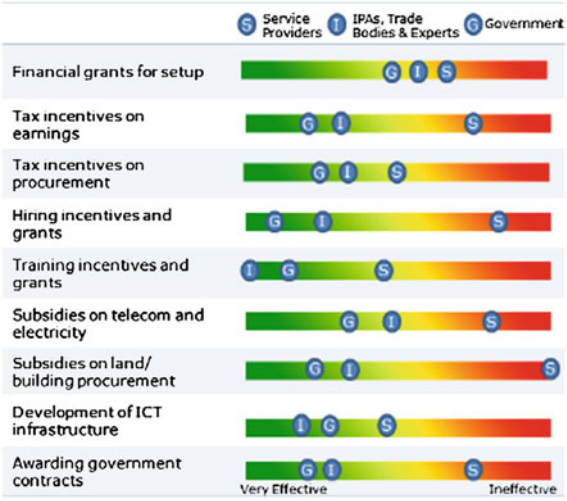


Fig. 9 Effectiveness of government policies (*Source* Avasant/Rockefeller Foundation 2012)

- What is the size of the global impact sourcing market?
- What is the annual growth rate?
- Which locations comprise the largest share of the global impact sourcing market?

Location attractiveness is another import research area. Accenture (2012) did a commendable analysis, but this is only one study. Within the broader academic outsourcing community, theories and empirical work have examined location attractiveness for ITO and BPO sourcing services. Several studies, for example, are based on a location's business, financial, and human resource attractiveness as we discussed in Lacity and Willcocks (2013). Business attractiveness is the degree to which a location is attractive because of favorable business environmental factors such as economic stability, political stability, cultural compatibility, infrastructure quality, and security of intellectual property (IP) (e.g., Malos 2009; Doh et al. 2009). Financial attractiveness is the degree to which a location is attractive because of favorable financial factors such as labor costs, taxes, regulatory, and other costs (e.g., Malos 2009; Doh et al. 2009). Human resource attractiveness is the degree to which a location is attractive because of favorable people skills and availability factors such as size of labor pool, education, language skills, experience, and attrition rates (e.g., Malos 2009; Mehta et al. 2006). A location's attractiveness can change rapidly, as happened with the political upheavals in Egypt in 2011, which halted international investment in Egypt's ITO services export market. For this reason, continued research on location attractive is needed:

- Which locations need impact sourcing the most?
- Which locations are most attractive to clients?
- Which locations are most attractive to impact sourcers?
- How does location attractiveness change over time?

The survey results from Avasant/Rockefeller Foundation (2012) about perceptions of public policy effectiveness are fascinating because stakeholders held very different perceptions. Most interestingly, the service providers rated none of the nine public policies as very effective. In contrast, other stakeholders, most notably government respondents, rated these policies as effective to very effective. Clearly more research is needed:

- What is the effectiveness of various public policies on impact sourcers?
- What is the effectiveness of various public policies on marginalized individuals?
- What is the effectiveness of various public policies on communities?
- What is the effectiveness of various public policies on attracting clients?

5 Conclusion

We suggest that research on impact sourcing focus on the dimensions that make up the *impact*—the dependent variable. Impact sourcing is about making an impact and therefore it is critical that our research focus on its measurement. This paper presented a framework comprising an ecosystem of impact sourcers, employees of impact sourcers, communities where employees reside, and clients of impact sourcing services. The framework also includes global issues, like location attractiveness, and public policy issues. Although more research is needed on all the key constructs identified in the framework, we particularly hope that this framework inspires researchers to study the impact of impact sourcing on the employees.

References

Accenture. (2012). Exploring the value proposition from impact sourcing: The Buyer's perspective. Retrieved from http://www.accenture.com/us-en/Pages/insight-exploring-value-proposition-impact-sourcing.aspx.

Ashoka. (2013). *Ashoka: Innovators for the public*. Retrieved from https://www.ashoka.org/.

Avasant/Rockefeller Foundation. (2012). Incentives & opportunities for scaling the "Impact Sourcing" sector, 2012. *Corporate report by Avasant consultancy*. Retrieved from http://www.rockefellerfoundation.org/news/publications/incentives-opportunities-scaling.

Babin, R. (2008). Assessing the role of CSR in outsourcing decisions. *Journal of Information Systems Applied Research, 1*(2), 3–14.

Babin, R., & Nicholson, B. (2009). Corporate social and environmental responsibility in global IT outsourcing. *MIS Quarterly Executive, 8*(4), 123–132.

Babin, R., & Nicholson, B. (2011). How green is my outsourcer? *Strategic Outsourcing International Journal, 4*(1), 47–66.

Babin, R., & Nicholson, B. (2012). *Sustainable global outsourcing: Achieving social and environmental responsibility in global IT and business process outsourcing*. London: Palgrave.

Balit, S. (2004). "Food and Agriculture Organization" in communication for isolated and marginalized groups: Blending the old and the new. *Communication for Development Roundtable Report*, *1*, Retrieved from http://www.fao.org/sd/dim_kn1/docs/kn1_040701a2_en.pdf.

Barret, V. (2010) Silicon Valley's Prison Call Center. Forbes, June 28.

Chambers, R. (2008). *Revolutions in development inquiry* (1st ed., Vol. 1). London: Earthscan.

Conan, N. (2010), "Inmates' Jobs, From Call Centers to Paint Mixing," Talk of the Nation, National Public Radio, Broadcast, December 16.

Cuoto, V., & Ashok, D. (2006) How to be an outsourcing virtuoso. (2006). *Strategy Business* (44), Retrieved from http://www.strategy-business.com/media/file/sb44_06304.pdf.

Doh, J., Bunyaratavej, K., & Hahn, E. (2009). Separable bot not equal: The location determinants of discrete services offshoring activities. *Journal of International Business Studies, 40*, 926–943.

Doong, S. H. and Ho Shu-Chun. (2012). The impact of ICT development on the global digital divide. *Electronic Commercial Application*, *11*, 5

Elkington, J. (1995). Speaker at Sustain Ability conference, for which Elkington is cofounder: http://www.johnelkington.com/activities/speeches_archive.asp.

Elkington, J. (1997). *Cannibals with Forks: The triple bottom line of 21st century business*. Oxford: Capstone Publishing.

Gino, F., & Staats, B. (2012). The microwork solution. *Harvard Business Review, 90*(12), 92–96.

Gorry, A., & Scott Morton, M. (1971). A framework for management information systems. *Sloan Management Review, 13*(1), 55–70.

Heeks, R., & Arun S. (2010). Social outsourcing as a development tool: the impact of outsourcing IT services to women's social enterprises in Kerala. *Journal of International Development, 22*(4), 441–454.

Heeks, R. (2012a). A model for assessing IT impact sourcing relationships; *Web paper*. Retrieved from http://ict4dblog.wordpress.com/tag/socially-responsible-outsourcing/2012b.

Heeks, R. (2012b). The research agenda for IT impact sourcing, blog. *ICTs for Development*, *Web paper 2012a*. Retrieved from http://ict4dblog.wordpress.com/2012/05/06/the-research-agenda-for-it-impact-sourcing/.

Hefley, B. (2009). Social responsibility in sourcing: The state of CSR in sourcing. Presentation for Global Sourcing Council Summit, New York, June 3, 2009.

IAOP. (2009). "Summary of Findings from the IAOP 2009 CSR Survey" an IAOP Research White Paper. Retrieved from http://www.iaop.org/Content/23/126/1698/.

International Fund for Agricultural Development. (2002). *Managing for impact in rural development: A guide for project M and E.* Rome, Italy. IFAD. Retrieved from http://blog.apastyle.org/apastyle/2011/07/how-to-cite-the-dsm-in-apa-style.html#gsc.tab=0.

Ives, B., Hamilton, S., & Davis, G. (1980). A framework for research in computer-based management information systems. *Management Science, 26*(9), 910–934.

James, N. (2007). Federal Prison Industries. Congressional Research Service, Cornell University ILR School. Retrieved from http://digitalcommons.ilr.cornell.edu/key_workplace/309.

Kaganer, E., Carmel, E., Hirschheim, R., & Olsen, T. (2013). Managing the human cloud. *MIT Sloan Management Review*, *54*(2).

Lacity, M. (1990). *The role of frameworks in information systems research*, Ph.D. Seminar final paper, The University of Houston.

Lacity, M., & Willcocks, L. (2013). Sourcing of information technology services. In H. Topi (Ed.), *The computing handbook set* (Information Systems and Information Technology) (Vol. 2) forthcoming.

Lacity, M., Khan, S., Yan, A., & Willcocks, L. (2010a). A review of the IT outsourcing empirical literature and future research directions. *Journal of Information Technology, 25*(4), 395–433.

Lacity, M., Rottman, J., & Khan, S. (2010b). Field of dreams: Building IT capabilities in rural America. *Strategic Outsourcing: An International Journal, 3*(3), 169–191.

Lacity, M., Carmel, E., & Rottman, J. (2011). Rural outsourcing: Delivering ITO and BPO services from remote domestic locations. *IEEE Computer, 44*, 55–62.

Lacity, M., Rottman, J., & Carmel, E. (2012). *Emerging ITO and BPO markets: Rural sourcing and impact sourcing*. IEEE Readynotes, IEEE Computer Society.

Leviner, N., Crutchfield, L. R., & Wells, D. (2007). Understanding the impact of social entrepreneurs: Ashoka's answer to the challenge of measuring effectiveness. *Research on Social Entrepreneurship: Understanding and Contributing to An Emerging Field*, *1*(3), 89–104. Retrieved from https://www.ashoka.org/resource/4784.

Lorenzetti, J. P. (2002, July 3). Qualitative benefits. *Government Technology*, 1–2. Retrieved from http://www.govtech.com/e-government/Qualitative-Benefits.html.

Malos, (2009). Regulatory effects and strategic global staffing profiles: Beyond cost concerns in evaluating offshore location attractiveness. *Employee Responsibilities and Rights Journal, 22*, 113–131.

Mason, R., & Mitroff, I. (1973). A program for research on management information systems. *Management Science, 19*(5), 475–487.

Mehta, A., Armenakis, A., Mehta, N., & Irani, F. (2006). Challenges and opportunities of business process outsourcing. *Journal of Labor Research*, *27*(3), 323–337. Project Management for Development Professionals. (2012). *PMD Pro Guide* (1st ed.). Retrieved from http://www.pm4ngos.net/index.php?option=com_phocadownload&view=category&id=1&Itemid=10.

Park, K., & Hollinshead, G. (2011). Logics and Limits in Ethical Outsourcing and Offshoring in the Global Financial Services Industry. *Competition and Change*, *15*(3), 177–195.

PMD, A Guide to the PMD Pro, April 2013, accessed June 2014 http://www.pm4ngos.org/index.php/pmd-pro-guide

Porter, M. E., & Kramer, M. R. (2006). Strategy and society: The link between competitive advantage and corporate social responsibility. *Harvard Business Review*, *84*, 78–92.

Porter, M. E., & Kramer, M. R. (2011). Creating shared value. *Harvard Business Review, 89*(1/2), 62–77.

Prahalad, C. K. (2004). *The fortune at the bottom of the pyramid*. Upper Saddle River: Wharton School Publishing.

Pratt, M. (2008). Ethical outsourcing. *Computerworld, 42*(17), 32–33.

Ramus, T., & Vaccaro, A. (2012). Blurring the boundaries between for profit and non-profit organizations: The social enterprises. *IESE Insight* (BEN-132-E). Retrieved from http://www.ieseinsight.com/fichaMaterial.aspx?pk=89153&idi=2&origen=3&ar=17.

Root Capital. (2013). *Root Capital.* Retrieved from http://www.rootcapital.org.

Rootchange. (2014). *Rootchange* Retrieved from http://www.Rootchange.org Accessed on june 2014

Savitz, A., & Weber, K. (2006). *The triple bottom line: How today's best-run companies are achieving economic*. JossyBass, San Francisco: Social and Environmental Success.

Saylor W., Gaes, G. (1997) Training Inmates through Industrial Work Participation and Vocational and Apprenticeship Instruction. *Corrections Management Quarterly 1* (2), 32–43.

Saylor, W., & Gaes, G. (2001). The differential effect of industries and vocational training on post release outcomes for ethnic and racial groups. *Corrections Management Quarterly, 5*(4), 17–24.

Stern, E., Stame, N., Mayne, J., Forss, K., Davies, R., & Befani, B. (2012). Broadening the range of designs and methods for impact evaluations: Report of a study commissioned by the department for international development. *Department for International Development* (38), 1–127. Retrieved from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/67427/design-method-impact-eval.pdf.

TechnoServe. (2014). *Technoserve*. Retrieved from http://www.technoserve.org. Accessed on june 2014

The Monitor Group/Rockefeller Foundation. (2011). Job creation through building the field of impact sourcing. *Corporate Report by Monitor Consultancy*. Retrieved 2013, from http://www.deloitte.com/view/en_US/us/Services/consulting/Strategy-Operations/strategy-consulting/index.htmRootchange.org.

United Nations Development Program (2008) in Reynolds, A. (2008, September). *Promoting inclusive parliaments: The representation of minorities and indigenous peoples in parliament*. United Nations Development Program Advisory Committee First advisory meeting on inclusive parliaments. Retrieved from http://www.ipu.org/dem-e/minorities/faq.pd.

Viviers, S., & Eccles, N. (2012). 35 years of socially responsible investing (SRI) research: General trends over time. *South African Journal of Business Management, 43*(4), 1–16.

Corporate Social Responsibility in Global IT Outsourcing: A Case Study of Inter-firm Collaboration

Ron Babin and Brian Nicholson

Abstract This paper examines the intersection of corporate social responsibility (CSR) and global information technology outsourcing (GITO). The growing business participation in global CSR standards such as the Global Reporting Initiative, ISO 26000 and the UN Global Compact, demonstrates that CSR issues are important to buyers and providers of outsourcing services. The case study examines the outsourcing relationship between Co-operative Financial Services (CFS) and outsource provider Steria. Specifically we report on how aligned CSR priorities of the buyer and provider may identify opportunities for CSR collaboration. The case uses an analytical lens based on trust theory. The paper contributes practical knowledge of how trust developed in CSR collaboration may provide benefits in the areas of: (1) workforce efficiencies, (2) increased communication, and a (3) higher level of commitment to work through challenges in the outsourcing relationship. We found that by working together, in collaborating on CSR projects that both CFS and Steria built a more robust outsourcing relationship with a higher level of trust which leads to more successful outsourcing outcomes. The paper contributes to improved theoretical understanding of trust in market based inter firm outsourcing relationships and to the "doing well by doing good" discourse in CSR.

Keywords Outsourcing · Social responsibility · Trust · Collaborative CSR

R. Babin (✉)
Ted Rogers School of Management, Ryerson University, Toronto, ON M5B 2K3, Canada
e-mail: rbabin@ryerson.ca

B. Nicholson
Manchester Business School, The University of Manchester, Manchester M15 6PB, UK
e-mail: brian.nicholson@mbs.ac.uk

R. Hirschheim et al. (eds.), *Information Systems Outsourcing*, Progress in IS,
DOI 10.1007/978-3-662-43820-6_17

1 Introduction

This paper is focussed on how trust is developed between outsource buyers and providers who collaborate on Corporate Social Responsibility (CSR) projects. Collaboration is a co-operative arrangement in which two or more parties work jointly in common enterprise toward a shared goal. This implies close partnering, developed over and for the long term distinguished by reciprocal risk sharing, investment of resources and time (Kern and Willcocks 2000). Although social researchers recognize that trust is a difficult and complex concept to define, there is some agreement that trust involves three elements of vulnerability, uncertainty and risk (Atkinson and Butcher 2003). In this paper we define trust as a characteristic of the outsourcing relationship between two organisations, i.e. between an outsource buyer and an outsource provider, that helps to maintain strong and effective collaboration between the two parties (Barrett et al. 2008; Lewicki and Bunker 1996; Sabherwal 1999).

Elements of vulnerability, uncertainty and risk exist in a complex global outsourcing relationship. For example, the buyer is vulnerable to the ability of the provider in terms of project or operational performance, for example providing an available system or completing a project on time to provide new business functionality. The buyer has limited control over the provider and is vulnerable to the ability of the provider to perform. Because the buyer must rely on the provider, taking a risk that the provider performance will meet the terms of the contract, there is an element of uncertainty. In the outsourcing relationship, the buyer must trust the provider. As the provider demonstrates reliable, predictable performance over time, trust between the two organizations grows. Conversely, uncertain performance increases the risk and reduces trust between the two organizations.

Prior research has argued that collaborative partnership arrangements between outsourcing buyer and provider are important particularly when involving innovation or when mission critical applications have been outsourced (Willcocks et al. 2011, p. 128). There is significant literature that explains the mechanisms and practices of how trust is fostered in a partnership outsourcing arrangement (Kelly and Noonan 2008; Sabherwal 1999). However, to date there has been no examination of the specific role of CSR in the trust building process. This paper aims to fill the gap in the literature and improve our understanding of how buyer and provider collaboration on CSR projects may contribute to trust.

The role of CSR is steadily rising in business although surprisingly relatively little research has been conducted on CSR in outsourcing arrangements. “There can be little doubt that CSR is an increasingly prominent theme in business. Even the sceptics acknowledge this” (Moon 2007, p. 299). The Economist reports that the priority that executives give to CSR issues approximately doubled in 3 years from 2005 to 2008 (Franklin 2008). The Global Reporting Initiative (GRI) has tabulated the number of corporate CSR reports filed annually since 1999, growing from nine in 1999 to approximately 1900 in 2010. According to GRI, from 2006 to 2011, the yearly increase in uptake ranged from 22 to 58 % (2011).

A limited literature focuses on CSR to build trust. Sagar and Singla (2003) describe the importance of trust and respect for businesses, which is exemplified by CSR, in the Indian economy. Accenture, an outsource provider, has described trust as built "around the pillars of environmental stewardship, social impact and responsible corporate governance". (Lacy et al. 2010, p. 8). Bhattacharya et al. have identified CSR as a "key stakeholder relationship-building activity" (2009, p. 263). CSR leads stakeholders to form strong bonds with the company and to develop trust towards the relationship, when the company signals to the stakeholder that it understands their needs and is therefore "like them". This paper contributes to this discourse of CSR building trust, in relation to outsourcing arrangements which is hitherto unexplored.

The research question this paper seeks to answer is this: How does collaboration on CSR projects affect trust in an outsourcing relationship?

Our motivation for this research is to better understand how CSR can enhance the buyer-supplier outsourcing relationship, which has been suggested as key to success "in achieving their expected outsourcing objectives" (Kern and Willcocks 2002, p. 3). One research study suggests that the quality of the outsourcing relationship may contribute "at least 30 % of the annual contract value" (Ertel et al. 2010, p. 51). Our research focuses on the trust component in the outsourcing relationship and how trust can be enhanced through collaborative CSR activities.

The empirical basis for the paper is a case study that reveals how collaboration on a CSR project between outsource buyer and provider builds trust in the relationship. This case study is considered revelatory because the researchers had access to detailed, relevant and complete data and opportunity to analyze the phenomenon of collaboration in CSR across buyer and provider firms which was previously inaccessible (Yin 2009).

This paper is structured as follows. First, we review literature on collaboration in outsourcing and introduce the conceptual frameworks that are used to analyse the case study. Second, the methodology is described for the Co-operative-Steria case study. Third, the case is described and analysed with a focus on how CFS and Steria collaborate on a CSR project and build trust in the outsourcing relationship. The CSR project is supporting schools in India. Finally, the paper concludes with the contribution to theory and practice.

2 Literature Review and Conceptual Framework

2.1 Corporate Social Responsibility

What is corporate social responsibility? Matten and Moon (2008, p. 405) define CSR as a "clearly articulated and communicated set of policies and practices of corporations that reflect business responsibility for some of the wider societal good … CSR is differentiated from business fulfilment of core profit making responsibility and from the social responsibilities of government". Others state that CSR

is a concept that overlaps with business ethics, corporate philosophy, corporate citizenship, sustainability and environmental responsibility (Crane et al. 2008). McWilliams et al. (2006, p. 1) define CSR as "actions that appear to further some social good, beyond the interests of the firm and that which is required by law".

Buyers and providers of outsourcing services have increasingly embraced CSR issues. Since early reports on this topic (Babin 2008; Babin and Nicholson 2009) the volume and intensity of CSR discussion in outsourcing has grown considerably. For example, the International Association of Outsourcing Professionals (IAOP) established a CSR Committee in 2009 with the goal of defining a CSR guide for the outsourcing industry; the Global Sourcing Council (GSC) recognises leaders in CSR with an annual Sustainable and Socially responsible Sourcing (3S) award; in 2010 the International Association of Outsourcing Professionals (IAOP) began to evaluate the CSR profile of applicants to the Global Outsourcing Top 100. India's NASSCOM has established the NASSCOM Foundation "with the aim to use information and communication technologies for development (ICT for D) and to catalyse the corporate social responsibility arena within the Indian IT industry" (NASSCOM 2011). A 2010 IAOP survey on social responsibility in outsourcing found that "CSR is an important and growing issue for outsourcing customers and providers—71 % say that CSR will become more important or much more important in future outsourcing contracts" (Babin and Hefley 2010). These examples demonstrate the growing interest and importance of CSR to the outsourcing industry.

There is a large literature that examines the motivations for organizations to embrace CSR. Firstly, organisations may embrace CSR out of benevolent philanthropy. Secondly, organisations may use CSR to protect the corporate brand and reputation (Lai et al. 2010; Lewis 2003; Werther and Chandler 2005). Thirdly, a recent discourse concerns the rationale to embrace CSR "to do well by doing good" (Berthon et al. 2010; Falck and Heblich 2007) which also includes integrating social and financial returns (Emerson 2003). This discourse largely focuses on how CSR is embraced to gain overall competitive business advantage (Berns et al. 2009; Porter and Kramer 2006, 2011). Porter and Kramer have built linkages between theories of firm competitiveness (Porter 1987, 2008) and CSR (Porter and Kramer 1999, 2002, 2006, 2011). The authors describe the concept of creating value through focused philanthropy to create a new set of strategic tools that strengthen an organisation's competitiveness. In their recent papers (2006, 2011) they have focused on CSR as a "source of opportunity, innovation and competitive advantage". They argue that prevailing justifications for CSR, such as moral obligation and reputation, have created "muddled" corporate-responsibility thinking. Instead, the authors advocate evaluating CSR opportunities "to create shared value—that is a meaningful benefit for society that is also valuable to the business".

The latter "doing well by doing good" perspective on CSR is of relevance to this inquiry as will become apparent.

2.2 Trust and Outsourcing

Trust has been established in the academic literature as playing a key role in outsourcing relationships, In a review of the IT outsourcing (ITO) empirical literature, Lacity et al. (2010) found that trust is a significant positive relationship characteristic for outsourcing: "Of the 10 times Trust was empirically examined, it was always associated with better ITO outcomes or found to matter" (p. 409). Numerous researchers have examined the role of trust in outsourcing using case studies. For example, Rottman (2008, p. 31) described the importance of social capital, which includes trust, for "successfully outsourcing software development". In a case study of a US Manufacturing outsource to an Indian software outsource provider, Rottman found that "value is created through social relationships", with include "higher levels of trust", and that "trust allowed the internal teams to fully engage the offshore teams" to foster knowledge transfer required for the software outsourcing to be successful. Kelly and Noonan (2008) examined the role of trust as a mechanism to reduce anxiety and improve psychological security. The authors demonstrate the importance of trust and show how it is manifested differently during particular phases (Courtship, Cohabitation) of the outsourcing relationship. Sabherwal agrees, stating that although trust is difficult to develop in outsourced IT development projects, there is a strong "need for trust in these projects, which frequently require the cooperation of strangers in tough, high-stress situations" (Sabherwal 1999, p. 81). In examining how modern global organizations "collaborate each effectively across national boundaries" Child (2001, p. 274) posits that informal understanding, based on trust, is a powerful factor in inter firm collaboration. Personal bonding and a sense of mutual identity between alliance and team partners can reinforce their determination to solve problems. Heiskanan et al. distinguish between trust, control and power, and define a specific type of trust, called behaviour trust, as the "understanding, goodwill and intention to voluntarily take corrective actions, and openness when failures occur" (Heiskanen et al. 2008, p. 271).

The main theoretical lens for this inquiry is shown in Fig. 1 that provides a schematic of model of trust developed by Lewicki and Bunker (1996). This aligns with a common spectrum of outsourcing relationships, from a contract oriented relationship (calculus-based) to a partnership relationship (identification-based). Contractual governance is based on calculus-based trust, ensuring consistency of behaviour by imposing penalties for non-conformance. An example would be contractual clauses related to financial consequences imposed on a provider for not meeting a KPI. Relationship governance is concerned with knowledge-based trust and is based on track record of success. Knowledge-based trust occurs when a buyer (or provider) has enough information over time, (e.g. SLA's met, problems solved etc.) to accurately anticipate likely behaviour. Identification-based trust is based on empathy with the other party's desires and intentions. At this third level, trust exists because each party mutually understands, agrees with and empathizes with the values of the other.

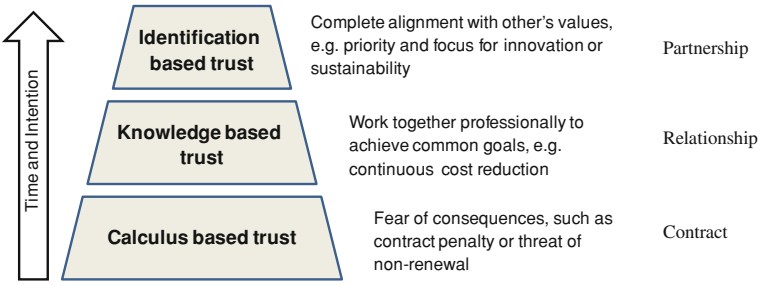


Fig. 1 Hierarchy of trust (adapted from Lewicki and Bunker 1996)

Child (2001, p. 283) elucidates on the evolution of trust from calculation "being prepared to work with you" to understanding "getting to know you" to the final trust stage of bonding "coming to identify with you as a person".

Calculus-based trust involves a rational process whereby one party calculates the costs and/or rewards of another party cheating or cooperating in a relationship. Identification trust by contrast is influenced by the ongoing experience and meaning of the relationship and develops when partners identify with shared values and norms. Identification-based trust is "based on a complete empathy with the other party's desires and intentions" (Lewicki and Bunker 1996, p. 119). At this stage, the two parties commit to commonly shared values and commit to the same set of objectives.

3 Research Methodology

A qualitative case study research strategy was employed to explore the collaboration within the outsourcing context (Yin 2009). Co-operative Financial Services (CFS) and Steria (both organizations are real companies, not pseudonyms) were selected after a request was sent via an industry association newsletter for firms interested in participating in research on CSR in outsourcing. CFS head office is in Manchester where the interviews were conducted CFS made contact and following a set of discussions on the scope of the project introduced the authors to Steria, their outsourcing provider. We chose to pursue this case because both organisations have a very strong social commitment. For the reasons given earlier, this case represents a revelatory case (Yin 2009, p. 47) which supports the rationale for a single case.

3.1 Data Collection

The main data collection method was via semi structured interviews using a predefined set of questions to structure the interview process but allowing the interviewee to bring additional perspectives to the discussion that may not be covered by the set of questions.

The case study was conducted over a 1 year period, starting in December 2009 and completing in January 2011. The case study consisted of four stages.

The first stage involved initial contact between the authors and CFS. During this stage the terms of reference for the study and the discussion outline for the interviews was agreed. The second stage was an intensive 2 week period of interviews conducted onsite at CFS headquarters in Manchester, in June and July 2010. Prior to beginning the interviews an ethical review was completed at the sponsoring University, to ensure that appropriate protocols were in place. In this period, 23 interviews were completed with CFS and Steria staff. A total of 15 h of interviews were recorded, with the average interview lasting about 40 min. The third stage involved secondary field work, reviewing the findings and collecting further data. Additional documents identified in the interviews were collected and reviewed. Five follow-up interviews were conducted to gather additional information that may have been missed in the first round. This stage was completed in January 2011. The fourth and final stage of the case study consisted of the sharing of information with key stakeholders. A management report was presented to the CFS and Steria executives, the CIO and the head of the IT outsourcing unit.

3.2 Data Analysis

The data was analysed by examining the individual transcripts. Codes were created by identifying common themes derived from frequently used words in the interviews. Theorisation of the data was undertaken during ongoing engagement with the research participants, collection of data, reading of the outsourcing literature and discussion between the researchers. Previous drafts of this paper were presented at internal seminars at our respective Universities and submitted to workshops and conferences all of which received critical feedback essential for our analysis and theorisation of the case.

4 Case Description

Cooperative Financial Services (CFS) is part of The Co-operative Group, the UK's largest consumer co-operative. CFS is the group of businesses that includes The Co-operative Insurance and The Co-operative Bank, incorporating internet bank

Smile and Britannia Building Society. CFS revenues for 2010 were £550 million. CFS employs 12,000 staff in more than 300 branches and 20 corporate banking centres. Ethical, environmental and community matters take a high priority at CFS and there are a range of ethical policies setting out the way the society conducts business, most of which have been developed in consultation with customers many of whom are members. The Co-operative's social responsibility focus has deep foundations which date back to 1844 when it began as the Rochdale Society of Equitable Pioneers whose goal was the "improvement of the social and domestic condition of its members" (Fairbairn 1994). The local social objectives of the Rochdale Pioneers have evolved to become the Co-operative Group's focus on global CSR and today the Co-operative balances profitable operations with a "purpose beyond profit" and with a goal to "show the way forward for corporate sustainable development in the UK". The Co-op Values and Principles Committees are responsible for establishing social and environmental priorities and for managing the Ethical Operating Plan. The Ethical Operating Plan establishes social and environmental goals in the areas of ethical finance, tackling global poverty, protecting the environment, inspiring young people and keeping communities thriving. Progress is reported annually in the Co-operative Group Sustainability Report. The Co-operative has been recognised for its sustainable leadership with an Environmental Leadership Award in 2009 from Business in the Community and a Platinum Plus ranking in 2010 for Corporate Responsibility (The Co-operative Group 2010, p. 121)

CFS perceives CSR as distinguishing it from competitors but that this advantage is challenged by others in the marketplace and should therefore continue to reinforce its advantage in this area. As one CFS executive explained: *People see us as leading but other organisations are catching up quickly…everybody is on the bandwagon. We need to up our game and up the stakes. We've got to keep pushing the boundaries to maintain our reputation*. Maintaining CFS's position as a leader in CSR is a significant motivating factor for collaborating with their GITO providers.

4.1 Outsourcing to Steria

The outsourcing relationship between CFS and Steria (previously Xansa) began in the 1990s. Steria's work is primarily focused on the maintenance and support of legacy software applications at CFS. In 2009, CFS total spend with Steria was the second largest (after IBM) and represents 22 % of the total overall outsourcing spend.

Compared to global IT service companies such as IBM, Accenture and others, Steria is a mid-tier, regional firm and ranks itself as Europe's ninth largest IT service provider with 1.2 % of the market share in Western Europe. Steria employs over 18,600 employees across 16 countries and has offices in Europe, India, North Africa and South East Asia. Headquartered in Paris, revenues in 2010 were €1.7 billion. Steria's main business is consulting and systems integration (51 % of revenue) and

IT infrastructure management (31 % of revenue), with additional revenues from business process outsourcing and third-party applications maintenance. Steria speaks proudly of its social responsibility reputation. For example, according to the Steria Corporate Registration Document, the governance model has included employee shareholders since its foundation in 1969 and currently 20 % of the capital of Steria is held by employees. Steria is a member of the UN Global Compact. In 2008 and 2009 Steria was recognised for its CSR activities in India, receiving the Best Practice Award sponsored by the NASSCOM Foundation and the Bombay Stock Exchange. Steria's focus on Corporate Responsibility has a dual focus on the environment, "proactively participating in the support of a sustainable world for all," and on social responsibility, "bringing greater independence to disadvantaged people". In its corporate strategy Steria identifies the need to "reconcile development and social responsibility". Steria is "dedicated to the fight against digital divide and exclusion [with] its support for the most disadvantaged in India, enabling notably the [Steria] Group associating its customers in its actions for responsible development of its business" (Steria 2011b). Regarding disadvantaged people, Steria has focused on education in India for underprivileged children and those in rural communities with an emphasis on young women. This aligns with two Co-op social responsibility priorities: "International Development" and "Inspiring Young People" which is an example of the cultural fit between Steria and CFS.

4.2 The OSOCOS Partnership Project

The "One Steria One Country One School Programme" in India (OSOCOS) programme is offered to selected buyers as a route to partnering by injecting resource into schools located in the Indian cities of Chennai, Pune or Noida, where Steria centres are located. Participation in the programme is voluntary and is not part of a formal outsourcing agreement. The programme is structured as a 3 year commitment for the buyers and fifteen schools were supported by Steria and their buyers as of May 2010. The arrangement enables the buyer to involve staff, family and friends in the India project and to publicise the project when visiting India and list involvement in marketing material. The buyer is presented with a "menu" of engagement options and a price list. Steria encourages partnering buyers to communicate with the children in the school through "mentorship" that may involve email, video conferencing and scheduled visits. When visiting Steria centres, buyer staff (usually high-ranking executives) are encouraged to visit the school they have sponsored. Steria refers to this arrangement as a "community collaboration procedure". Steria employees provide volunteer training and support for the schools.

As an example, at the Medavakkam High School in Chennai, the Steria volunteers provided the following support:

- a training programme, delivered at the Steria offices, to teach computer basics to the teachers, covering Microsoft Word, Excel, PowerPoint and internet usage
- computer helpdesk support at the school with weekly visits to answer queries

- a mentorship programme to grade nine students, with 1 h visits each week to help the children to improve their English language skills
- a motivational workshop on career awareness skills and the importance of goal setting

On an ongoing basis, Steria keeps track of the number of schools, projects and children who benefit from OSOCOS (see www.steriafoundation.com). Steria measures progress on the projects by the number of awards or recognition given by external organizations, as well as the number of client partnerships. For example, in the Steria (2011a) Corporate Responsibility Report, four awards were noted from the Bombay Exchange and the Nasscom foundation, as well as eight client partnerships in the OSOCOS programme.

The "fit" between Co-operative and Steria is shown in the "three clear priorities for community investment" in Cooperative 2009 Sustainability Report which are:

- Inspiring young people, where the Co-op commits to nurturing and supporting young people,
- Tackling global poverty, where the Co-op will help support people in the developing world, and
- Combating climate change.

OSOCOS links to the first two Co-operative priorities. Education for needy children in India is also important for Steria because of the growing need for skilled and dedicated workers in the Indian outsourcing centres. Interestingly, Steria is beginning to invest in solar-powered computer centres at the schools, which is a project that will align with the CFS climate change CSR priority.

Of the 15 schools supported by Steria, two have been sponsored by CFS; the first of these is Medavakkam high school, which has been sponsored since 2007. CFS has supported a computer centre with 10 new computers and a library. The Steria involvement there is ongoing, for instance in July 2007 Steria volunteers provided 12 days of computer training.

The second school sponsored by CFS is the Shri Ghanshyam Sharma Memorial High School in Dujana, Noida. It was established in 1999 and has 1,035 pupils aged 5–15 years old. Children are from low income group families, farmers, labourers etc. CFS sponsorship commenced in May 2010 with budget of £15,714. The CFS contribution covers the initial equipment purchase and Steria volunteers provide ongoing support such as software upgrades and technical support.

CFS is not obliged to provide continuing support beyond the initial contribution, although they are encouraged to continue the relationship and to consider new OSOCOS projects.

The involvement of CFS is more than simply philanthropic writing of cheques to a good charitable cause. Senior executives from both CFS and Steria participate together in annual visits to the sponsored schools. Students and school staff welcome the CFS executives and provide updates to CFS executives on their success and progress. For example, Steria provides CFS with Board exam results for the classes at sponsored schools.

CFS's commitment to the OSOCOS programme is actively supported by the highest executive level. Tim Franklin, Chief Operating Officer for CFS is the overall project sponsor and is quoted in the Steria Corporate Responsibility Summary: "Steria's school programme is leaving an indelible legacy in the communities in which they serve—and CFS is hugely proud to be involved". The CIO for CFS, Jim Slack, commented how pleased he was with the warm appreciation from students when he visited the Medavakkan High School and his desire to continue supporting the schools in India.

We learned from Steria that the OSOCOS programme is used as a mechanism to collaborate with many outsource buyers. Steria cites several clients such as the BBC, the Royal Mail, and British Telecom as "client partnerships" in the OSOCOS programme (Steria 2011a, p. 42). Collaboration in this CSR programme builds trust in the outsourcing relationship which benefits Steria and its the outsourcing buyers.

5 Case Analysis

OSOCOS provides a foundation for trust building between the outsource buyer and provider. The sections to follow show how OSOCOS aiding underprivileged school children is a priority for both buyer and provider organisations. Both parties benefit from joint visits and monitoring of the students' progress. The two key themes that emerged from the case study are divided into trust *building between buyer and provider* and secondly *trust building within the respective buyer and provider organizations*

5.1 Trust Between Buyer and Provider Organizations

Calculus-based trust is reflected in the outsourcing contract where rewards and penalties are defined and calculated. However, identification-based trust where "each party effectively understands, agrees with, empathises with and takes each other's values" (Lewicki and Bunker 1996, p. 119) aptly describes the outcome of OSOCOS collaboration. A CFS executive told us about the desired relationship with outsource providers: *We want a common set of values—to build more trust,* [*with*] *like-minded organisations,* [*where*] *we share something in common*.

The first contention is that collaboration on OSOCOS helps individuals in the provider firm to better understand the buyer contributing to knowledge based trust.

One Steria executive commenting on OSOCOS' benefits said:

> It's about working with my main contacts; working with India enables me to understand what makes CFS tick, what makes the company tick.

Secondly OSOCOS collaboration enables individual inter firm relationships to develop beyond the calculative trust expressed in the commercial contract.

Collaboration on OSOCOS creates novel contexts in which identification trust can be built between the outsource provider and buyer staff. The contexts of interaction take the relationship between the two parties beyond the calculative trust expressed in service level agreements in the contract. As one Steria executive said:

> These trips out to India are where you really get to know your customers, because you're with them 24 h a day. And when you share different experiences with them, as you know, it puts your relationship on a very different plain. I think the closer that you work together, the more effective you are. And then from my point of view, the more effective you are, you keep the business.

The shared values expressed by contributing to the OSOCOS create a bonding effect between individuals (Child 2001). The context provided by OSOCOS is not associated by contractual matters but may facilitate discussion of issues during that time. Collaboration provides an opportunity for much greater interaction and cross-linkage between the individuals in the two firms beyond that of the formal communication routes detailed in the outsourcing contract. This greater breadth of communication in OSOCOS context increases the opportunity to communicate beyond the contractual outsourcing stipulation between individuals at multiple levels within each organisation. The formal hierarchy of seniority or contractual protocol; may be subsequently overridden for problem solving or when things go wrong. Another Steria executive noted,

> I would just say it massively helps with our relationship and how we work together,.. You also bring in teamwork and there are so many other things that come into it, other skills such as communication. You really get to know the people who you're working with, and when you see them out of a techie environment, it makes a huge difference.

This last quote shows the importance of team building and the importance of "getting to know each other" outside of the formal work environment; to understand the person outside of the outsourcing relationship. This comment typifies the CFS-Steria relationship, where the interpersonal relationship is considered to be equally as important as the contractual relationship.

A Steria manager said

> CSR initiatives have helped to diminish the formal communication hierarchy—allows more junior staff to speak directly with seniors on a CSR related activity.

Furthermore, there is evidence that individuals that had met in OSOCOS context tended to be less "guarded" in dealing with Steria subsequently: [Steria staff and executives] *are closer to the action. They're closer to the internal discussion. It's not a standoff where 'I'm protecting my IP mindset'. So the defences go down and as a result of that, other things open. They participate in the charity event. They participate in the general spirit and culture of things that are happening* CFS manager.

The buyer and provider "harmonize" as people begin to develop a collective identity (their defences go down) and to empathise strongly with each other.

Identification trust develops through regular communications and watching each other perform in social situations, experiencing a variety of emotional states and learning how others view this behaviour (Lewicki and Bunker 1996, p. 121).

A Steria executive observes:

> So when you've been to these places and shared the experience with people, it does help form a very close relationship… Let's face it, in outsourcing things don't go perfectly well over time because they don't and that's the reality of it. You're in a world where you're delivering projects and services. It's a fast moving world and not all projects go perfectly well. Good relationships get you through on those situations…. You keep the buyers that you have, and that's about strong relationships.

This comment strongly echoes other research besides our own on the importance of trust in outsourcing projects "which frequently require the cooperation of strangers in tough, high-stress situations" (Sabherwal 1999, p. 81). Trust develops through a "frame-change", in this case the collaboration in India, in which the CFS and Steria staffs have moved to a personal identification with each other. Besides OSOCOS, CFS invites outsourcing providers to their community day activities, as described by one CFS executive *Because it's a team-building exercise as well … we are trying to involve each other in those types of activity because it helps to embed the relationship in a way that just meeting around the table in the office doesn't do. It helps to embed the relationship and just make people feel like they are one community*.

5.2 Trust Within the Buyer and Provider Organization

Collaboration in OSOCOS had the effect of productivity improvement for both the buyer and provider. There are two main points of contention: first, trust developed in the OSOCOS collaboration reduced employee turnover. Second, the OSOCOS collaboration built engagement and team work.

Let us first explain why trust developed by OSOCOS collaboration has contributed to lower staff turnover. CFS recognises and values the low turnover of the Steria outsource employees and managing staff turnover is a perennial problem in outsourcing (Nicholson and Aman 2012).

A Steria manager told us:

> Turnover is the biggest thing for me. So we're not constantly losing staff in their area and bringing new staff in and letting it just start off with new skills, which means projects have more of a success of delivery in the time schedule set.

While the Steria average attrition rate for 2010 was 16.5 % attrition on the CFS project was only 12 % and in some cases Steria turnover could be as high as 25 %. Others have reported that Indian outsource providers "can expect to lose 15 to 20 % of their work forces each year" (Scheiber 2004). Turnover is costly for the provider, who must hire and train new replacement employees, and can be problematic for buyers because of the disruption to service when a provider staff

member leaves. Reducing attrition is a benefit to both the outsource provider and buyer because the buyer gains continuous service from a knowledgeable outsource employee and the provider keeps training and recruiting costs low. Steria reports that its average annual training cost is €691 per person, and the number of annual average days of training is 2.7 days per person for 2010. We learned that several hundreds of Steria employees work on the CFS account. The ability to reduce attrition by 4.5 % from the organisation average should translate into significant savings for Steria.

Steria executives commented that the Indian outsourcing market has a high level of employee turnover. We heard from one Steria executive about the challenges of keeping turnover low:

> India are going through huge attrition throughout each outsourcer – it doesn't matter whether it's BPO, ITO. There is massive attrition because the labour pool is becoming far more switched-on and they are moving to that extra three rupees or the promise of a different kind of education…India is booming again this year. And attrition is a massive issue for the industry…

The same interviewee commented on the CFS account:

> Attrition on the CFS account is really, really…nothing compared to others, and I mean it stands out. … What it is certainly linked to is the strength of the relationship between the two organisations which is really visible to the guys in India…

Another Steria executive also described the lower staff attrition on the CFS account, but cautioned that it was not entirely attributable to OSOCOS:

> We do have a lower attrition rate on the CFS account, I don't think it's purely down to OSOCOS but I think it contributes. The ethical and social element does help. I wouldn't say it was THE reason why the attrition rate is lower but it definitely contributes.

Although CSR cannot be pinpointed as the only factor, anything that lowers staff turnover is a benefit to buyer and provider, in an outsourcing relationship, where the service is delivered by well-trained and experienced staff, the benefit of lower attrition, which reduces costs and improves service, is a major benefit. The reduced staff attrition between CFS and Steria, which is partially attributed to collaborative CSR, would be difficult for another provider to quickly reproduce, given the time and energy required to create the initial collaboration between the two firms.

The second main contention is that OSOCOS collaboration contributed to motivation, of employees at both Steria and at CFS. This may be explained by employees expressing the view that they are working towards an inspiring vision that is about more than financial profit. The Co-operative Annual Report states the aim "to build a better society… to be an ethical leader; to be an exemplary employer" (The Co-operative Group 2011). In a period when global financial challenges have disrupted many national economies this vision, which is demonstrated through OSOCOS and other CSR projects, motivates employees. A senior manager at CFS told us the value of engagement derived from CSR projects:

> … Engagement is the issue for me. If I've got engaged staff, they're going to stand up and step forward rather than sit back and be passive. I mean it's not just in the textbook, it's a fact you see. It exudes from the pores of the individuals working on a programme… engagement is the thing, everywhere you get more out to people and they get more out of you if you're engaged.

Researchers have commented that employee engagement "is a desirable condition, has an organizational purpose, and connotes involvement, commitment, passion, enthusiasm, focused effort, and energy" (Macey and Schneider 2008, p. 5). Productivity is a key benefit from engaged employees. Employees at CFS and at Steria who are inspired by a working environment with a vision that embraces more than maximising profits tended to work longer and with more dedication. Employees display an identification-based trust where they identify with the shared values of providing improved education through their companies' contributions to OSOCOS.

Interviewees spoke of the energy and attentiveness of the motivated employees who are engaged in OSOCOS .

One Steria account manager told us that

> People stay longer, sometimes they're investing a lot of their time and it's not paid, I won't necessarily see it on my bottom line, but you will see it on the productiveness of that project, of hitting targets, etc.

A CFS executive told us about the motivation of Steria employees who value the strength of the relationship with CFS:

> When you are under pressure of getting the tests done against a tight deadline, do you know what the guys say? Well, time to go home now, or do they stay for midnight? These guys stay until midnight and beyond and all night if necessary….the school [CSR] thing is just a little part of that – it just builds that.

This demonstrates the benefits of identification based trust derived from shared values where the Steria employees have developed a collective identity with CFS. The two firms have committed to commonly shared values such as helping schools with needy children in India rewarded by working late to complete an important software project. Other researchers have described similar phenomenon of employee engagement though social responsibility. Bowman describes the "intensifying search for meaning and purpose in work … and that employees are looking to business to answer questions about the meaning of life" and "employees are looking for a sense of connectedness or community at work, and for their work to be an opportunity to contribute towards society" (Bowman 2004). Researchers at MIT have identified how CSR can be used to attract and retain young workers, who expect meaningful work at responsible organizations (Bhattacharya et al. 2008). Others have described how social responsibility in the workplace boosts employee engagement, suggesting that "a sense of pride [from social responsibility] is a major driver of both morale and results… Other research has shown that companies that enhance their reputations through CSR perform better, and generate greater employee loyalty from workers" (Amble 2007). There is nothing necessarily new about motivated employees being more productive.

What is new in this research is that outsource provider and buyer employees working together, on CSR projects that they all support, contributes to improving the identification based trust between the two groups and enables them to collectively become more motivated and productive in their outsourcing work.

6 Conclusion

This paper set out to examine the research question: How does collaboration on CSR projects affect trust in an outsourcing relationship? Steria is able to align with and support the Co-operative CSR priorities and in doing so builds strong identification-based trust (Lewicki and Bunker 1996). As a basic requirement, Steria must be able to provide IT outsourcing services to contract at a competitive price, similar to other providers at CFS. By adding a social dimension to its value proposition with the OSOCOS programme, Steria are able to distinguish services from the competition. The social impact of providing educational support to underprivileged children in India becomes integral to the overall strategy of Steria, and to continuation of its outsourcing relationship with CFS.

We posit that collaborative CSR activity has workforce benefits. It reduces attrition, improves staff retention, builds team morale and engagement; inspires commitment to work longer, harder, and attracts, engages and retains workers, especially young workers.

Let us now consider the implications of this paper for research theory and practice. The novelty of this paper lies in the exposition of the theoretical concepts of CSR and how transacting organisations may "do well by doing well by doing good" through trust building. A contribution to Porter and Kramer (2011) lies in the application of the principles to market based outsourcing relationships which are hitherto unexplored. For example, the Porter concept of shared value is demonstrated in both the buyer and provider gaining better outsourcing performance through collaboration on CSR projects, which create better trust. It may be argued that a limitation of the findings is in the basis of single case and that CFS as a cooperative is not representative of many commercial organizations.

Dealing first with the single case basis, we argue that the case is revelatory and offers deep insight and analytical generalisation (Yin 2009) linked to an established model of trust building (Lewicki and Bunker 1996). The findings improve our understanding of trust building mechanisms and deep insight enriches established models of outsourcing relationship building (Kern and Willcocks 2000) The model has been enriched by providing an revelatory case study of how trust can be built, through collaborative CSR, thus strengthening the foundational behaviours between the buyer and provider. Steria has described how this model of collaborative CSR, through the OSOCOS program, is used with other clients such as Royal Mail, Boots, the BBC and British Telecom. In the US, we have examined a similar collaborative CSR model between Northern Trust and Tata Consultancy Services. Although this paper presents a single revelatory case, these additional

examples of collaborative CSR suggest that this concept is not unique to CFS and Steria.

With regard to implications for practice, we suggest four actions for outsource buyers to encourage collaborative CSR with outsource providers. First, carefully choose and recognise those outsource providers who are willing to collaborate in CSR projects. Second, focus on CSR initiatives that are common, or are considered by both organisations to be priorities, such as commitment to education, or to reducing poverty in developing areas, or creating a cleaner environment. Third, start with small collaborative CSR initiatives to learn how to work together and to build momentum and trust. Fourth, measure and revise the collaborative efforts and reconfirm that on-going CSR projects continue to meet objectives for the individual organisations and for the outsourcing relationship.

Steria described other outsourcing clients where a similar approach was used and we have since observed similar CSR projects in other buyer-provider relationships. Although the use of CSR in the outsourcing relationship, to build trust may not be widespread and may not be appropriate for all outsourcing deals, it is reasonable to suggest that others may benefit from exploring the opportunity to collaborate on CSR projects in the context of outsourcing. With the intention of building trust, and fortifying the outsourcing relationship, both buyer and provider will benefit.

Future work may establish how balanced scorecard may be used to measure goals for trust and collaborative CSR with their providers. Secondly, longitudinal study would be valuable to track increasing value over time.

References

Amble, B. (2007). *Social responsibility boosts employee engagement*. Retrieved August 29, 2011, from http://www.management-issues.com/2007/5/9/research/social-responsibility-boosts-employee-engagement.asp.

Atkinson, S., & Butcher, D. (2003). Trust in managerial relationships. *Journal of Managerial Psychology, 18*(4), 282–304.

Babin, R. (2008). Assessing the role of CSR in outsourcing decisions. *Journal of Information Systems Applied Research, 1*(2).

Babin, R., & Hefley, B. (2010). *Corporate Social Responsibility in Outsourcing: Summary of findings from the IAOP 2009 CSR survey*: IAOP.

Babin, R., & Nicholson, B. (2009). Corporate social and environmental responsibility in global IT outsourcing. *MIS Quarterly Executive, 8*(4), 123–132.

Barrett, M., Hinings, C. R., & Oborn, E. (2008). *Legitimacy management and trust in offshoring information technology services.* Paper presented at the IFIP: Information technology in the service economy: Challenges and possibilities for the 21st century, Toronto, Canada.

Berns, M., Townend, A., Khayat, Z., Balagopal, B., Reeves, M., Hopkins, M., et al. (2009). Sustainability and competitive advantage. *MIT Sloan Management Review, 51*(1), 19–26.

Berthon, B., Abood, D., & Lacy, P. (2010). *Can Business Do Well By Doing Good?*: Accenture.

Bhattacharya, C. B., Korschun, D., & Sen, S. (2009). Strengthening stakeholder-company relationships through mutually beneficial corporate social responsibility initiatives. *Journal of Business Ethics, 85*, 257–272.

Bhattacharya, C. B., Sen, S., & Korschun, D. (2008). Using corporate social responsibility to win the war for talent. *MIT Sloan Management Review, 49*(2), 37–44.
Bowman, T. J. (2004). *Spirituality at work: An exploratory sociological investigation of the ford motor company*. London: The London School of Economics and Political Science.
Child, J. (2001). Trust-the fundamental bond in global collaboration. *Organizational Dynamics, 29*(4), 274–288.
Crane, A., Matten, D., & Spence, L. (2008). *Corporate social responsibility readings and cases in global context*. London: Routledge.
Ertel, D., Enlow, S., & Siddall, B. (2010). Managing Outsourcing Relationships to Maximize Value. *Evolving Relationship Management Practices*. Vantage Partners.
Emerson, J. (2003). The blended value proposition: Integrating social and financial returns. *California Management Review, 45*(4), 35–51.
Fairbairn, B. (1994). *The meaning of rochdale*. Regina, Canada: Centre for the Study of Co-operatives, University of Saskatchewan.
Falck, O., & Heblich, S. (2007). Corporate social responsibility: Doing well by doing good. *Business Horizons, 50*, 247–254.
Franklin, D. (2008). Just good for business. *The Economist* 1–24.
Global_Reporting_Initiative (2011). *GRI Sustainability Reporting Statistics—Publicaiton Year 2010*: Global Reporting Initiative.
Heiskanen, A., Newman, M., & Eklin, M. (2008). Control, trust, power, and the dynamics of information systems outsourcing relationships: A process study of contractual software development. *Journal of Strategic Information Systems, 17*, 268–286.
Kelly, S., & Noonan, C. (2008). Anxiety and psychological security in offshoring relationships: The role and development of trust as emotional commitment. *Journal of Information Technology, 23*(4), 232–248.
Kern, T., & Willcocks, L. (2000). Exploring information technology outsourcing relationships: theory and practice. *Journal of Strategic Information Systems, 9*, 321–350.
Kern, T., & Willcocks, L. P. (2002). Exploring Relationships in Information Technology: The Interaction Approach. *European Journal of Information Systems*, *11*, 3–19.
Lacity, M., Khan, S., Yan, A., & Willcocks, L. (2010). A review of the IT outsourcing empirical literature and future research directions. *Journal of Information Technology, 25*, 395–433.
Lacy, P., Teo, L. L., Piotroski, S., & Cowling, J. (2010). *Trust: Managing the scarcest commodity of all*: Accenture.
Lai, C.-S., Chiu, C.-J., Yang, C.-F., & Pai, D.-C. (2010). The effects of corporate social responsibility on brand performance: The mediating effect of industrial brand equity and corporate reputation. *Journal of Business Ethics, 95*, 457–469.
Lewicki, R. J., & Bunker, B. B. (1996). Developing and maintaining trust in work relationships (chapter 7). In R. M. Kramer & T. R. Tyler (Eds.), *Trust in organizations, frontiers of theory and research* (pp. 114–139). Thousand Oaks: Sage.
Lewis, S. (2003). Reputation and responsibility. *Journal of Communications Management, 7*(4), 356–364.
Macey, W. H., & Schneider, B. (2008). The meaning of employee engagement. *Industrial and Organizational Psychology, 1*, 3–30.
Matten, D., & Moon, J. (2008). "Implicit" and "explicit" CSR: A conceptual framework for a comparative understanding of corporate social responsibility. *Academy of Management Review, 33*(2), 404–424.
McWilliams, A., Siegel, D. S., & Wright, P. M. (2006). Corporate social responsibility: Strategic implications. *Journal of Management Studies, 43*(1), 2–18.
Moon, J. (2007). The contribution of corporate social responsibility to sustainable development. *Sustainable Development, 15*, 296–306.
NASSCOM (2011). Green IT initiative: Catalysing sustainable environment. Retrieved August 29, 2011, from http://www.nasscom.in/nasscom/templates/LandingNS.aspx?id=55759.

Nicholson, B., & Aman, A. (2012). Managing attrition in offshore finance and accounting outsourcing: Exploring the interplay of competing institutional logics. *Strategic Outsourcing: An International Journal*, *5*(3), 232–247.

Porter, M. E. (Writer) (1987). From competitive advantage to corporate strategy [Article]. *Harvard Business Review*: Harvard Business School Publication Corp.

Porter, M. E. (2008). The five competitive forces that shape strategy. *Harvard Business Review, 86*(1), 78–93.

Porter, M. E., & Kramer, M. R. (1999). Philanthropy's new agenda: Creating value. *Harvard Business Review, 77*(6), 121–130.

Porter, M. E., & Kramer, M. R. (2002). The competitive advantage of corporate philanthropy. *Harvard Business Review, 80*(12), 57–68.

Porter, M. E., & Kramer, M. R. (2006). Strategy and society: The link between competitive advantage and corporate social responsibility. *Harvard Business Review, 84*(12), 78–92.

Porter, M. E., & Kramer, M. R. (2011). Creating shared value. *Harvard Business Review, 89*(1/2), 63–77.

Rottman, J. W. (Writer) (2008). Successful knowledge transfer within offshore supplier networks: a case study exploring social capital in strategic alliances. *Journal of Information Technology*. London, United Kingdom: Palgrave Macmillan.

Sabherwal, R. (1999). The role of trust in outsourced IS development projects. *Communications of the ACM, 42*(2), 80–86.

Sagar, P., & Singla, A. (2003). Trust and corporate social responsibility: Lessons from India. *Journal of Communications Management, 8*(3), 282–290.

Scheiber, N. (2004). As a center for outsourcing, India could be losing its edge. New York: New York Times.

Steria (2011a). *Corporate responsibility report—managing our business responsibly*. Paris: Steria.

Steria (2011b). *Registration document 2010, group steria SCA*. Paris: Steria.

The Co-operative Group (2010). *Sustainability Report 2009*. Manchester UK.

The Co-operative Group (2011). *Building a Better Society: Annual Report and Accounts 2010*. Manchester UK.

Werther, W. B., & Chandler, D. (2005). Strategic corporate social responsibility as global brand insurance. *Business Horizons, 48*, 317–324.

Willcocks, L., Cullen, S., & Craig, A. (2011). *The outsourcing enterprise. From cost management to collaborative innovation*. Basingstoke, Hampshire, UK: Palgrave Macmillan.

Yin, R. K. (2009). *Case study research design and methods* (4th ed., Vol. 5). Thousand Oaks: Sage.

Social Capital: A Framework for Studying IT Outsourcing

Beena George, Rudy Hirschheim, Bandula Jayatilaka and Madhu Das

Abstract Social capital provides a lens that allows us to focus on a wide range of aspects in Information Technology (IT) outsourcing vendor-client relationships. At the same time, social capital enables us to view client-vendor relationships and IT outsourcing arrangements at a greater depth. We briefly describe how social capital has become increasingly popular in a wide range of social science disciplines. Yet, there is lack of common understanding regarding social capital. Hence, this paper first presents the various aspects of the concept—history, definitions, organizational advantage from social capital, and various applications of social capital frameworks to the research on managing organizations. Out of the many conceptualizations of the concept of social capital, we selected Nahapiet and Ghoshal's (1998) as the most appropriate one applicable to IT outsourcing. The paper then applies a comprehensive framework of social capital based on Nahapiet and Ghoshal (1998) to examine the IT outsourcing life-cycle and suggest future research directions in client-vendor relationship management.

Keywords Social capital · Framework · Relationship management · Outsourcing

B. George · B. Jayatilaka (✉)
Cameron School of Business, University of St. Thomas, Houston, TX 77006-4626, USA
e-mail: jbandula@binghamton.edu

B. George
e-mail: georgeb@stthom.edu

R. Hirschheim
E. J. Ourso College of Business, Louisiana State University, Baton Rouge LA70803, USA
e-mail: rudy@lsu.edu

M. Das
Infosys, Bangalore, India
e-mail: madhu.das@gmail.com

R. Hirschheim et al. (eds.), *Information Systems Outsourcing*, Progress in IS,
DOI 10.1007/978-3-662-43820-6_18

1 Introduction

Outsourcing business-critical information technology (IT) applications has become a basic sourcing strategy, and has experienced considerable growth in recent years. With its ability to cater to the needs of both the client and the vendor, IT outsourcing has created an attractive business model in the global business arena. Since the early days of IT outsourcing, researchers have investigated and reported on practice and discovered relevant concepts (Dibbern et al. 2004). As the IT outsourcing practice has matured, the emphasis has shifted from the study of why and what to outsource to the management of the outsourcing arrangements and client-vendor relationships. In early studies, researchers demonstrated that the client-vendor relationship is a key predictor of outsourcing success (Grover et al. 1996; Lee and Kim 1999). Following Kern and Willcocks' (2002) call to address relationship management in IT outsourcing, researchers (e.g., Goles and Chin 2005) have studied the topic, building our understanding of the success factors in outsourcing management. Our attempt in this paper is to view the past research from a Social Capital perspective and provide a framework that will be useful for identifying the relationships among past research as well as for identifying potential topics for future research.

The concept of 'Social Capital' serves as a lens to view social relationships (hence organizational relationships) as a value-adding intangible asset that enables revenue generation and profitability. The earliest use of the term in the recent time was in late nineteenth century when researchers and scholars explored and discussed roles and characteristics of social ties using numerous concepts and dimensions. Later, Nahapiet and Ghoshal (1998) identified three dimensions of social capital and explained the relationship between social capital and intellectual capital. This can be used to reveal the relevance of social capital to IT activities, which are closely associated with organizational knowledge or intellectual capital.

Researchers and managers view IT outsourcing mainly as an activity where the decision criteria hinges upon the organizational advantage and market advantage dichotomy. Non-commodity aspects of IT and business processes associated with IT add a degree of complexity to the outsourcing process due to the knowledge embedded nature of the aforementioned processes. The stages of IT outsourcing such as vendor selection, formulation of agreements, implementation and management occur in the contexts of social relationships. Our contention is that the characteristics of the social relationships affect the effectiveness and outcomes of the approaches taken during each stage of the outsourcing life-cycle. The effect of social capital becomes especially critical during the latter stages, i.e., operationalization and management of IT outsourcing contracts, including setting up of appropriate organizational structures, establishing performance standards and metrics, and as well as managing the relationship.

Motivated by the desire to examine the utility of social capital frameworks in studying client-vendor relationships in IT outsourcing, this paper aims to (i) use the social capital lens proposed by Nahapiet and Ghoshal to take a closer look at

the client/vendor relationships in IT outsourcing, and (ii) use this understanding to develop a framework for future research in IT outsourcing. Given the focus of the Nahapiet and Ghoshal framework on the creation of intellectual capital, it is particularly appropriate to apply this framework in the study of IT outsourcing where innovative implementations of technology are the desired outcome. Dimensions like goals, trust, norms, shared knowledge, and structures are important for obtaining desired outcomes. Especially with non-commodity IT outsourcing, IT activities are directly associated with organizational knowledge and for both vendors and clients, the creation of intellectual capital is important. Although Nahapiet and Ghoshal's focus is on internal intellectual capital, it is possible to extend the concept to IT outsourcing arrangements where vendor and client share intellectual capital.

1.1 Increasing use of 'Social Capital': A Background

Social capital, as generally understood, is the goodwill engendered by the fabric of social relations, which has the potential to facilitate action when mobilized. It has informed the study of social phenomena such as families, youth behavior problems, schooling and education, public health, community life, democracy and governance, economic development, and general problems of collective action (Adler and Kwon 2002). For example, Ainsworth (2002) examined the role of social capital in migration patterns and Cechhini and Raina (2002) found that social capital had a facilitating role in the networking technology implementation and acceptance in a rural Indian community.

In organization studies, too, the concept of social capital has been widely applied. Kostova and Roth (2003) studied how social capital facilitated coordination between sub-units in a multinational organization, while Kanter (1994) explained how social capital at the individual level facilitated business partnerships. According to Adler and Kwon (2002), social capital proves to be a powerful factor in explaining actors' relative success in a number of arenas of central concern to organizational researchers—e.g. career success and executive compensation, recruitment, inter-unit resource exchange and product innovation, the creation of intellectual capital and cross-functional team effectiveness, turnover rates and organizational dissolution rates, entrepreneurship, supplier relations regional production networks, and inter-firm learning.

Information systems (IS) researchers have also applied the concept of social capital. Three broad areas involving the social capital concept have emerged in IS research: (1) case studies of IT outsourcing using the social capital framework (Chou et al. 2006; Rottman 2008); (2) the role of virtual communities in building social capital (Erickson et al. 2002; Smith 2002; Hiltz and Turoff 2002; Oxendine et al. 2003); and (3) a social capital framework to explain knowledge sharing

between individuals/organizations (Kankanhalli et al. 2005; Wasko and Faraj 2005; Chiu et al. 2006). The frequency and breadth of the use of the social capital concept suggests that an innate feature of social ties has triggered interest in it in multiple disciplines

1.2 Background on Outsourcing Relationships

The major focus of outsourcing research has shifted extensively in the last decade. Over time, research issues have evolved from *whether to outsource* to *how to manage outsourcing* (Hirschheim et al. 2002, 2009; Dibbern et al. 2004). Despite the understanding offered by the studies on IT outsourcing relationships, PricewaterhouseCoopers (2009) found that only 40 % of client/vendor relationships were working effectively, indicating that many organizations and vendors still need to resolve relationship issues. We believe that the social capital concept enables IT outsourcing researchers to capture more of the nuances of the client/vendor relationship. In a seminal article on social capital, Nahapiet and Ghoshal (1998) "provided theorizing having both scientific and practical utility …and integrates existing views into a coherent and comprehensive theoretical model" (Corley and Gioia 2011, p. 22). The social capital framework proposed by Nahapiet and Ghoshal, which relates it to intellectual capital, has lent itself to examinations of IT outsourcing (George 2006; Willcocks et al. 2009).

In the following sections, we present a brief history of the development of the social capital concept, describe the organizational advantage that can arise from social capital, and then summarize the Nahapiet and Ghoshal (1998) framework. The fifth section presents an application of the concept of social capital to IT outsourcing, and develops a framework and directions for future research. We offer concluding comments and suggestions for the use of the social capital framework in the last section.

2 Social Capital: A Brief History

The history of social capital reflects the use of the concept to explain phenomena in a large number of social sciences fields—viz. education, political economy, sociology, social psychology, urban planning, political science, and management. Moreover, in all these fields, it refers to the use of social relations for achieving desired outcomes.

There are two broad areas in the social sciences that applied the concept of social capital—works on civic education by researchers such as Hanifan (1916, 1920) and Dewey (1915); and the work of political economists ranging from Marx to Marshall to Bellamy. Current conceptualizations of the term primarily have their roots in the work of Bourdieu (1986), Coleman (1990) and Putnam (1993).

Taking a Critical Social Theory approach, Bourdieu (1986) argued that an individual's position in social space is defined not by class, but by the amount of capital he/she possesses across the three kinds of capital-cultural, economic and social capital—and by the relative amounts of each. Bourdieu's perspective of individual outcomes significantly differed from the normative approach of Coleman (1988) and Putnam (1993) and the network based utilitarian approach of Burt (2000a, b) and Lin (1999).

Coleman's work represented a shift from Bourdieu's individual outcomes, to outcomes for families and groups, which essentially represented a tentative shift from egocentric to socio-centric. Coleman also added that like other forms of capital, social capital is instrumental in making possible the achievement of certain ends that would not be attainable in its absence (Coleman 1988). He extended the scope of the concept from Bourdieu's analysis of the elite to encompass the social relationships of non-elite groups (Adam and Roncevic 2003). Robert Putnam popularized civic engagement, which is the membership in voluntary organizations. Coleman's *Foundations of Social Theory* (1990) was his central source (Routledge and Amsberg 2003) for developing the concept. He developed the measure called 'Putnam instrument' (Adam and Roncevic 2003). This instrument is a simplified version of his elaborate index of 'civicness' that includes four indicators: (i) trust in people and institutions, (ii) norms of reciprocity, (iii) networks, and (iv) membership in voluntary associations (Adam and Roncevic 2003). Burt (2000a, b) based his research on social capital on utility of networks and measured social capital through measurement of network variables e.g. closures and structural holes. Lin (1999), often worked with Burt, and contributed to the refinement of network measurements of social capital, namely through the development of the position generator and name generator (Lin et al. 2005).

Nahapiet and Ghoshal (1998) applied social capital to an organizational context to explain the role of social capital in intellectual capital formation and value creation in a firm. Judging by the number of articles in academic journals as well as trade journals that use their "social capital" framework, it clearly has had significant appeal to management researchers. Although their primary purpose was to show that the firm has an advantage over the market due to the firm's ability to create social capital, we seek to apply Nahapiet and Ghoshal's (1998) conceptualization of Social Capital to investigate IT outsourcing research.

3 What Is Social Capital: Definitions

Social scientists have offered a number of definitions for social capital (Adler and Kwon 2002). While these definitions are broadly similar, they entail some significant differences. First, the definitions vary depending on whether they focus on the substance, the sources, or the effects of social capital (Robison et al. 2002). Another important aspect to consider is the location of social capital, i.e., where social capital is embedded. It can be individual or the collective (group or firm). In Table 1, we

Table 1 Social capital definitions

Reference	Definition	Focus	Location (Adler and Kwon 2002)
Bourdieu (1992)	Sum of the resources, actual or virtual, that accrue to an individual or a group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition	Substance	Individual with external focus
Coleman (1988)	Sum of the processes within and between groups that allow individuals to accrue benefits	Effects	Collective or group with internal focus
Putnam (1993)	Features of social organizations that facilitate coordination and cooperation for mutual benefit → set of expectations for action within a collectivity that affect the goals and goal-seeking behavior of its members	Sources	Collective or group with internal focus
Nahapiet and Ghoshal (1998)	The sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit	Substance and sources → networks and assets	Both internal (to the group) and external (to the individual)

summarize the definitions offered by Bourdieu (1992), Coleman (1988), Putnam (1993), Nahapiet and Ghoshal (1998). They see social capital as comprising both the network and the assets that may be mobilized through that network.

As a note to the definition, it is prudent to examine the suitability of the use of the term capital in social capital. There are similarities and differences between other forms of capital such as economic and physical capital (see Table A.1 in the appendix). Even if the use of the term capital is debatable, metaphorical use of the term may not be contentious.

In terms of relationships, Woolcock (1998) identified and distinguished between three forms of social capital: bonding, bridging, and linking social capital. Bonding capital connects individuals to people in similar situations. The focus is inward and it tends to reinforce identity and create homogenous groups. Bridging social capital join people to individuals in wider social circles (e.g. workmates). Bridging capital generates broader identities. Linking capital ties people in dissimilar situations. For example, it could consist of relationships up and down the economic scale. Putnam (2000) discusses the first two forms of capital in his work. He contends that bonding capital is necessary to 'get by' while bridging capital is necessary to 'get ahead'. While Woolcock's (1998) classification of social capital

allows us to understand the different types of relationships and their outcomes, it does not provide a framework for understanding the effect of having a fully connected network versus a network that is not fully connected. Burt (1992), on the other hand, focused on the degree of connectivity in a network.

Burt (1992) introduced the two concepts *closure* and *structural holes*. These concepts are important because they have a bearing on the accrued social capita. Burt argues that the ties an actor has with others can support or restrain one's actions. To build on his argument, he used the concept of 'structural holes'. When a connection does not exist between non-redundant actors, a structural hole exists. These holes present opportunities for the focal actor since the actor can now determine with whom to establish a tie with, and has greater freedom of decision and movement. When every actor in a network is connected, it is termed a 'network with closure' (Zaheer et al. 2010). In a network with closure, everyone is connected and no one escapes the notice of others. Although conceptually these two constructs seem to be opposites, structural holes offer an actor the advantage to be more flexible in transactions. Specifically, Burt (1992) argued that networks rich in structural holes are social capital for an actor whose network spans the holes. Conversely, Coleman (1988, 1990) argued that closure facilitates sanctions and is less risky as there is more trust. In reconciling these conflicting views, Burt (2004) points out that structural holes create social capital when there is competition, such as outside the group. However, when there is a need for cooperation, for example within the group, closure creates social capital.

The concept of strong ties and weak ties is worthy of mentioning in the discussion of social capital, as strength of ties is related to structure of networks. Following Granovetter, Lin (1999) separated ties into weak ties and strong ties. Strong ties bring individuals with similar resources together while weak ties bring people with dissimilar resources together. Thus, weak ties may be instrumental in achieving goals where access to new types of resources are necessary. While the above-mentioned researchers studied and explained the relational and network aspects in terms of links and the nature of links, Nahapiet and Ghoshal (1998) took a more in-depth view of the links' constituents in terms of cognitive and structural dimensions as well.

4 Nahapiet and Ghoshal's Organizational Advantage from Social Capital

Nahapiet and Ghoshal (1998) built on Ghoshal and Moran's (1996) critique of market-based theories, particularly transaction cost theory, where Ghoshal and Moran presented the notion of "organizational advantage". Advocating an organizational economy perspective, rather than one based on a market economy, Ghoshal and Moran (1996) argued that: "organizations are not mere substitutes for structuring efficient transactions when markets fail, but possess unique advantages for managing certain economic activities" (p. 13); applications of transaction cost

theory overlook this aspect, and thus are "bad for practice" (p. 13); transaction cost theory is a "static theory" (p. 13) applicable only to situations where markets and economies foster the uncontrolled growth of opportunism; organizations actually have an advantage over markets in that they are able to "leverage the human ability to take initiative, to cooperate, and to learn (p. 42)." When organizations are unable to create an internal environment that is conducive to the generation of trust and commitment, they will fail to achieve those benefits that accrue from cooperation and teamwork thereby diminishing organizational advantage. Nahapiet and Ghoshal (1998), in turn, explained how organizations could enjoy "organizational advantage," by employing "social capital" to generate an environment that is conducive to the creation of "intellectual capital.[1]" While this conceptualization of social capital is not directly applicable to the phenomenon of outsourcing, the idea of the creation of new intellectual capital through the combination and exchange of existing intellectual capital is a good fit for IT outsourcing where the need for combination and appropriation of knowledge is important for both vendors and clients.

4.1 Social Capital and Its Dimensions

Nahapiet and Ghoshal (1998) defined social capital as the access and resources available in an exchange relationship. Social capital thus has the potential to influence processes of knowledge creation in exchange relationships. Social capital is "the sum of the actual and potential resources embedded within, available through and derived from the network of relationships" and is collectively owned (Nahapiet and Ghoshal 1998, p. 243).

Based on a comprehensive review of the previous work on social capital, Nahapiet and Ghoshal (1998) identified three dimensions of social capital: the *structural*, the *relational*, and the *cognitive*. To distinguish between the structural and the relational dimensions, Nahapiet and Ghoshal (1998) relied on Granovetter's (1985) discussion of structural and relational embededdness. The structural dimension refers to the pattern of connections—"who you know and reach and how you reach them." The relational dimension refers to the assets that are rooted in these relationships, such as trust and commitment. While previous researchers recognized the importance of mutual understanding and sharing of knowledge among parties (Cohen and Levinthal 1990; Kogut and Zander 1996), Nahapiet and Ghoshal were the first to specify the cognitive dimension to include these elements. The cognitive dimension facilitates a common understanding by relying on shared representations and interpretations. Table 2 provides definitions of the three dimensions in Nahapiet and Ghoshal's framework.

[1] Nahapiet and Ghoshal (1998) identified intellectual capital as "the knowledge and knowing capacity of organizations."

Table 2 Definitions of social capital dimensions (Nahapiet and Ghoshal 1998)

Dimension	Associated Element	Definition
Structural Dimension: Pattern of connections—who you know, how you know and reach them	Network ties	Links that provide access to resources.
	Network Configuration:	Properties of ties between groups that afford the flexibility and ease of information exchange (Density, Connectivity, Hierarchy)
	Appropriable organization	"Organization" created for one purpose may provide a source of valuable resources for other purposes
		Direct—structure
		Indirect—capabilities
Cognitive Dimension: Resources providing shared representations and interpretations, and systems of meaning among parties	Shared codes and language	Codes organize sensory data into perceptual categories and provide a frame of reference for observing and interpreting the environment. Shared codes provide a common conceptual apparatus for evaluating the likely benefits of exchange and combination. Shared language facilitates communication
	Shared narratives	Tools that facilitate the exchange of meanings and tacit experience—e.g. stories
Relational dimension: Assets created and leveraged through relationships	Trust	Multi-dimensional; indicates a willingness to be vulnerable to another party, arising from 1, belief in the good intent and concern of exchange partners, 2, belief in their competence and capability, 3, belief in their reliability, and 4, belief in their perceived openness
	Norms	Shared beliefs of what constitute appropriate behavior; reflects a degree of consensus in the social system. Examples: cooperation, flexibility
	Obligations and Expectations	Commitment or duty to undertake some activity in the future
	Identification	A group sees themselves as one with another group of people

According to Nahapiet and Ghoshal (1998), while the separation of social capital into dimensions and their elements is necessary for analytical purposes, inter-relationships may exist among dimensions and within a dimension. For instance, trust, which is an element of the relational dimension, is necessary for the development of shared norms, which is yet another element of the same dimension. Trust is also necessary for the development of norms such as commitment (Ganesan and Hess 1997) and cooperation (Rindfleisch 2000). At the dimensional level, links exist between the dimensions. For example, without access, which is an element of the structural dimension, it is not possible to develop the elements of the relational dimension or enhance the elements of the cognitive dimension.

4.2 Social Capital Facilitates the Creation of Intellectual Capital

Four primary factors, i.e., age of the relationship, communications, dependence and closure (Nahapiet and Ghoshal 1998) enables social capital development. According to the primary argument in Nahapiet and Ghoshal (1998), social capital facilitates the creation of new intellectual capital in organizations by providing an environment conducive to the combination and exchange of resources.

Exchange and combination generates new intellectual capital at the group level. New intellectual capital result from combining different individuals' knowledge resources and is dependent on the exchange of such resources between the parties. Exchange enables the reallocation of resources, stimulating potentially new and productivity-enhancing combinations of resources. Such combinations can also lead to the creation of additional resources by stimulating the learning and innovation potential of the individuals involved (Moran and Ghoshal 1999). Thus, following Schumpeter (1934) Nahapiet and Ghoshal noted that the resultant new intellectual capital may be created through radical change, producing something that is entirely new, an innovation, or new intellectual capital may be created through incremental change, a combination of existing knowledge, or an enhancement to an existing routine.

The social, relational, and cognitive dimensions of social capital facilitate the processes necessary for combination and exchange. Figure 1 provides a graphical representation of Nahapiet and Ghoshal's (1998) arguments. Four factors are necessary for exchange and combination to take place. They are accessibility, anticipation of an outcome, motivation to exchange and combination capability. A basic requirement is the existence of an opportunity to combine and exchange resources, which is determined by accessibility of resources and is the first necessary condition for combination and exchange. Even if the opportunity exists, individuals may desist from exchanging and combining resources. However, if the individuals expect a worthwhile outcome from the process, they will feel

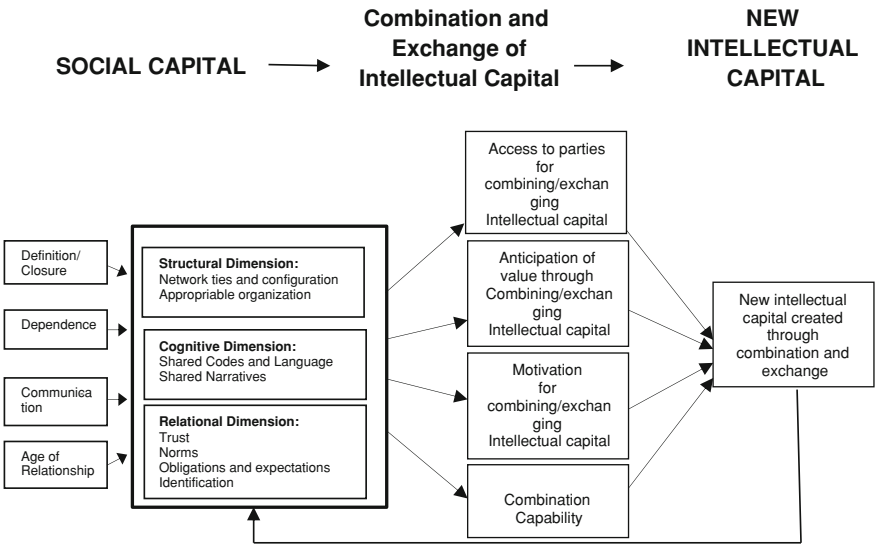


Fig. 1 Social capital in the creation of intellectual capital (Nahapiet and Ghoshal 1998)

encouraged to participate in the intellectual capital creation processes. This anticipation of value is the second condition necessary for combination and exchange. Additionally, if the individuals involved in the exchange believe that they can appropriate some value from the exchange, they will be motivated to exchange and combine. Thus, a third condition is that, individuals must be motivated to contribute to the process of intellectual capital creation.

However, even if these three conditions exist, lack of ability to assimilate and apply new knowledge may act as a barrier to combination and exchange of resources (Szulanski 1996). Nahapiet and Ghoshal (1998) termed the capability to overcome this barrier "combination capability"; this is the fourth condition necessary for the combination and exchange of intellectual capital. Various researchers have studied this phenomenon, recognizing its importance in achieving organizational advantage and acknowledging the "inertness of knowledge" (Kogut and Zander 1996). For instance, Cohen and Levinthal (1990) termed "absorptive capacity" the "ability of an organization to recognize the value of new external information, assimilate it, and apply it".

Nahapiet and Ghoshal emphasized the bi-directional structuring relationship between social capital and the work-process and the outcome: intellectual capital. They included a feedback loop from the creation of intellectual capital to social capital. Social capital enables exchange and the exchange supports and develops social capital in a "dialectical process" (Nahapiet and Ghoshal, p. 259), leading to the co-evolution of social capital and intellectual capital.

(i) *Age of the relationship*: Relationships build social capital over time. It takes time to produce the stability and continuity necessary for the development of social capital. Therefore, it is more likely that social capital will develop in

long-term relationships than in short-term transactions. Additionally, social capital will be valued more in long-term relationships while factors such as price will be valued more in short-term transactions.

(ii) *Communication*: Frequent interactions over time develop social capital. Communication between the parties promotes the development of the cognitive and relational dimensions of the social capital. In many inter-organizational settings, the structures put in place for the inter-organizational projects define communication patterns and mechanisms.

(iii) *Dependence*: Another factor that affects the development of social capital is the relative dependence of the people on each other. Such dependence intensifies or reduces with repeated interactions over time. Social capital is unlikely to develop where there is no reason for either party to be dependent on the other. However, perceptions of asymmetric dependence can negatively affect the development of social capital, especially the relational dimension.

(iv) *Closure*: Definition of task boundaries and teams provides an environment where trust and norms of cooperation and coordination as well as sharing of codes and language develop. Thus, closure aids in the creation of social capital.

5 Social Capital and IT Outsourcing: A Framework for Future Research

Most of the IT tasks require exchange and combination between the IT domains and business domains and this necessitates sharing. In IT outsourcing, sharing occurs between the vendor's technology domain knowledge and the client's business domain knowledge. Despite the vendor's profit motive and client's motive to minimize costs when meeting its business needs, the major outcome is the effective and efficient application of vendor's IT expertise and knowledge in client's business. A relationship that enables knowledge sharing as well as measuring and monitoring performance is essential.

Once these two organizations establish a contract, they move through the process of establishing a relationship. While the contract stipulates the organizational structure and interactions necessary to fulfill the objectives of an outsourcing arrangement, a strong relationship characterized by elements such as trust, norms of commitment and cooperation, and shared understanding is necessary to support the activities required to complete the processes associated with the outsourcing arrangement. These characteristics of the outsourcing relationship are central to the success of the arrangement and they are the elements that constitute social capital. Hence, we believe it is valuable to build upon the social capital perspective to examine the IT outsourcing phenomenon. Table 3 relates outsourcing relationship aspects to the various social capital elements described by Nahapiet and Ghoshal (1998).

Table 3 Social Capital Elements in the IT Outsourcing Context

	Facet of social capital	Definition	Evidenced in outsourcing relationship as
Structural Dimension	Network ties	The links that provide access to members of both organizations	Established through formal channels such as contracts and service level agreements, and through informal channels such as personal bonds
	Network Configuration	The structure for interactions between the two organizations	Defined by the contract or through the development of informal/personal ties
	Appropriable organization	The roles and routines defined for one task may be appropriated to a similar task	Transfer and engagement of routines to other projects
Cognitive Dimension:	Shared codes and language	Shared codes ensure a common understanding of the concepts and context associated with the task.	Shared understanding of the goals of the outsourcing arrangement as well as the activities and associated metrics of the outsourcing arrangement
		Shared language provides a means for sharing information about activities.	
	Shared narratives	Shared narratives cut across different contexts, facilitating the exchange of practice and tacit experience	Sharing experiences
Relational Dimension	Trust	Multi-dimensional; indicates a willingness to be vulnerable to another party, arising from (1) belief in the good intent and concern of exchange partners, (2) belief in their competence and capability, (3) belief in their reliability, and (4) belief in their perceived openness	Trust between organizations
	Norms: shared values of what constitutes appropriate behavior	A degree of consensus in the social system	Norms such as commitment, cooperation, and flexibility

(continued)

Table 3 (continued)

	Facet of social capital	Definition	Evidenced in outsourcing relationship as
	Obligations and Expectations	Expectations for the future	Expectations for business opportunities and growth
	Identification	A group sees themselves as one with another group of people	Similarity in cultures

Table 3 shows the elements of social capital existing in IT outsourcing. Based on this, we develop a framework to generate a list of possible research questions for further exploration in the context of IT outsourcing relationships.

5.1 The Framework

Our understanding of a *framework* borrows from Hirschheim et al. (1996). They posit that a framework provides categories for interpreting and relating the research literature and for understanding the co-evolution and de-evolution of diverse research concerns. Metaphorically, a framework is like a road map to explore a terrain (Hirschheim et al. 1996).

The core dimensions of the framework developed here are the elements of social capital, and the phases of the outsourcing life-cycle. As we are interested in relationship management in IT outsourcing, and relationship begins after the decision process of outsourcing is complete, our definition of the *outsourcing life-cycle* refers to the 'implementation' of outsourcing (Dibbern et al. 2004). We define the outsourcing life-cycle as consisting of stages of partner selection, negotiation and contracting, and managing the ongoing relationship and evaluation of outcome (Dibbern et al. 2004). In addition, we introduce a temporal element here. The contractual and governance structure issues arise early in an outsourcing arrangement. However, with the ongoing management of the relationship the contractual and psychological contracts between client and vendor evolve over time, leading to new or adjusted relationships. While it is true that the outcome of the outsourcing arrangement can be realized only as organizations move through the operations stage, the relationship and elements of social capital develop throughout the outsourcing life-cycle. Interactions at every stage of the life-cycle have an impact on the relationship and the outcome of the outsourcing arrangement. It is prudent to include all stages of the outsourcing life-cycle in the framework and refer to the relationships between client and vendor organizations. The purpose of this framework is: (1) to deepen the understanding of client/vendor relationships and enhance the ability to address the issue of failure in IT

Table 4 Social capital and the outsourcing life-cycle framework to generate client/vendor relationship issues

	Time			
Social capital element	**Partner selection**	**Negotiation and Contract**	**Operations and Management**	**Evaluation of outsourcing relationship**
Network ties and configuration	How do ties get established (formal vs. informal means)? What role do ties play in partner selection?	How does the nature of tie affect negotiation and contract?	How does the nature of tie affect operations and management?	How does the nature of network tie and configuration influence outcome of outsourcing relationship?
Appropriable organization	What is the role of appropriability in the sourcing decision?	How does appropriability affect negotiation and contract?	How does appropriability affect operational relationship?	How does appropriability influence outcome of outsourcing relationship?
Shared codes and language and Shared narratives	How does shared code and language affect partner selection?	How do shared codes and language affect negotiation and contract?	How do shared codes and language affect operational relationship?	How do shared codes and language influence outcome of outsourcing?
Norms	What is the role of norms in partner selection?	How do norms affect negotiation and contract?	What is the role of norms in operational relationship?	How do norms impact outcome of outsourcing?
Obligations and Expectations	What is the role of obligations and expectations in partner selection?	What is the role of obligations and expectations in negotiation and contract?	What is the role of obligations and expectations in operational relationship?	What is the influence of obligations and expectations in outsourcing success?
Identification	What is the role of identification in partner selection?	How does identification affect negotiation and contract?	How does identification affect operational relationship?	What is the influence of identification in outsourcing success?

outsourcing, (2) to provide a coherent structure for understanding relationship issues, and (3) to analyze the status of client/vendor relationships in outsourcing research, suggesting underdeveloped research areas which might then point to the direction of future research efforts.

Table 4 represents the framework. The first column and first row in Table 4 should be read as headings of the rows and the columns respectively. The row-heading, and column-heading, respectively, consist of the elements of social capital (Nahapiet and Ghoshal 1998) and the various phases in an outsourcing project (Dibbern et al. 2004). The cross-relation of social capital elements and the outsourcing life-cycle yields a set of questions relating to client/vendor

relationships (i.e. each cell of Table 4). The nature of client/vendor engagements could be over longer periods and numerous projects. We represent this by the depth of Table 4 (z-axis of table representing time). In order to improve clarity, we represent this depth as Table 5 (a nested table in two-dimensional form). The columns of Table 4 depict the phases of the outsourcing life-cycle of a single project. The columns of Table 5 are a juxtaposition of these phases, across projects between the same client and vendor pair. This representation is necessary because, relationships between a client/vendor pair usually span numerous projects and longer periods.[2] The framework is not only a static generation of questions based on social capital and outsourcing phases, but also helps raise issues with the dynamic progression of client/vendor relationships.

A research project can emerge from the question in each cell in Table 4. Issues in cells, in a row, or a column can serve as a basis to formulate research programs around. For example, the first row—*the role of network ties and configuration in the various phases of an outsourcing engagement* can be a basis for one research program and the first column, *social capital elements that play a role in partner selection in IT outsourcing*. can serve as a basis for another Similarly, the other rows point towards research related to the role of the other elements of social capital (namely, appropriable organization, shared codes and narratives, trust, norms, obligations and expectations, and identification) in the various phases of an outsourcing engagement. The other columns point towards research related to social capital elements that play a role in negotiation and contract, operations management and evaluation of outsourcing success. In the case of the selection of a new vendor, in the very first project, none of the elements of social capital other than network ties may come into picture. However, in subsequent projects with the same vendor, the social capital elements of appropriable organization, shared codes, trust, norms, obligations and expectations, and identification begin playing a role. The third dimension of time (proxy being subsequent projects) of the framework, generates questions relating to establishment and development of ties, trust, norms, shared codes, etc. in the relationships (in cells across phases in Table 5). It also triggers studies of social capital elements in particular outsourcing phases across projects– for example, *influence of trust in operations and management in initial projects versus later projects.* All the questions generated by the framework (Tables 4 and 5) can be looked at from both a client and/or a vendor perspective.

[2] The time factor or the age of the relationship affects the development of social capital. Nahapiet and Ghoshal (1998) suggest that in addition to the age of the relationship, communication and dependence between the parties, and closure in the relationship contribute to the development of social capital. We hold that time mediates the effects of the other three factors, making the age of the relationship the primary factor of interest. Thus, it would be interesting to study the development and alteration of the elements of the different dimensions through the life-cycle of an outsourcing project as well as across different projects with the same partners.

Table 5 Expanded depiction of effect of time in Social Capital and the Outsourcing Life-cycle framework

Social capital element	Project 1	Project 2	…	Project n
Network ties and configuration	How do network ties and configuration change over time in the relationship?			
Appropriable organization	How does the role of appropriability change over time in the relationship?			
Shared codes and language and narratives	How are shared codes and language established in the relationship?			
Trust	How is trust established in the relationship?			
Norms	How are norms established in the relationship?			
Expectations	How do tacit obligations and expectations develop in the relationship?			
Identification	How does identification with partner develop in the relationship?			

Over and above the relationship issues, following the notion of the bi-directional structuring of social capital and intellectual capital (Nahapiet and Ghoshal 1998), researchers also can examine how the elements of social capital and the IT outsourcing project artifacts interact and shape one another over time.

Thus, social capital provides an interesting lens to explore and research IT outsourcing relationships. Nahapiet and Ghoshal's (1998) framework for social capital provides this detailed view of the client/vendor relationships and helps to generate research questions and analyze them. For example, there are studies on vendor selection criteria (Michell and Fitzgerald 1997), but the nuances of factors like –formal or informal relationship triggers, the nature of ties, appropriability, shared codes, initial trust, and their roles in partner selection have not been researched yet. Similarly, despite, several studies regarding factors affecting outsourcing relationships and success (Lacity et al. 2009), factors such strength and configuration of ties, appropriability, shared codes and language, norms, obligations and expectations from previous relationships, identification of the vendor team with the client, have not been looked into. The social capital lens provides a wider set of parameters enabling a closer analysis of client/vendor relationships, which could contribute significantly to ensuring outsourcing success.

5.2 Existing Studies and Future Research Directions

In order to make Table 4 immediately usable to a researcher, this section places existing research in parts of the framework (Table 6). For brevity, representation of Tables 4 and 5 have been combined in Table 6. Table 6 is not intended as a comprehensive literature survey of IT outsourcing research. It intends to help identify research directions by indicating areas, which have not yet been studied (empty cells in Table 6). Table 6 also provides an overview of research done in certain areas, with an intention to provide a researcher with some threads to begin his/her inquiry.

In terms of network ties and configuration, Schroiff et al. (2010) explored how social network structures between individuals in outsourcing relationships influence the success of outsourced IT projects. Based on findings from prior research and the results of explorative case studies in outsourcing arrangements they proposed a model linking structural properties of social networks to dimensions of success of outsourced IT projects. The study considered a twofold construct of outsourced-project success from the client's perspective, entailing a long-term dimension of goal achievement and a short-term dimension of operational satisfaction. Miranda and Kavan (2005) drew on theoretical and empirical work in the areas of governance and contracts to develop a model of IT outsourcing governance. They observed that the IT outsourcing context circumscribes market, hierarchy, and network governance options that are available at promissory contract and psychological contract moments. Miranda and Kavan (2005) identified processes and structures that constitute governance choices at each moment of governance. In essence, existing research depicts a very limited treatment of the role of network ties and configuration in the various phases of the outsourcing lifecycle. However, while role of network ties in contracting, operations and management, and outsourcing outcome has been studied, its role in partner selection has not. This implies there is ample scope for research in this area.

'Appropriable organization' (as in the Nahapiet and Ghoshal framework) in IT outsourcing has not been studied at all. The related construct of appropriability (indicating whether something can be copied or not) has been studied in the context of outsourcing of innovation activities within the management, marketing and economics disciplines (Stanko and Calantone 2011). Appropriability concerns play a role in the decision of whether to outsource innovation activities or not (Stanko and Calantone 2011). In the context of IT outsourcing, the role of appropriability in the decision to insource or outsource has been studied (Mayer and Nickerson 2005). However, since the sourcing decision is not a part of the current framework, these studies have not been placed in Table 6. The issues of appropriability in various phases of outsourcing have, however, not yet been researched.

In terms of shared codes and narratives, Blumenberg et al. (2009) drew on a series of case studies covering IT providers and banks, to examine the differential influence of various types of knowledge transfer processes on shared knowledge between the parties and on the resulting outsourcing performance. Results showed that the combination of processes designed to transfer explicit and tacit knowledge

Table 6 Existing work and research gaps

Facet of social capital	Partner selection	Negotiation and Contract	Operations and Management	Evaluation of outsourcing relationship
Network ties and configuration		Identified processes and structures constituting governance choices (Miranda and Kavan 2005)	Effect of social network structures on IT outsourcing project success (Schroiff et al. 2010)	
Appropriable organization				
Shared codes and language and Shared narratives				Influence of knowledge transfer processes & shared knowledge on outsourcing success (Blumenberg et. al. 2009); Relationship between shared knowledge, mutual dependency, and organizational linkage (Lee and Kim 2003)
Trust	Role of trust (Lee and Choi 2011; Babar et al. 2007; Cong and Chau 2007)	Contracts for building relationships (Goo and Nam 2007); Trust and formal contracts (Woolthuis et al. 2005); Contractual hazards and trust (Barthélemy 2003)	Trust and control (Langfield-Smith and Smith 2003); Trust and success (Sabherwal 1999)	Trust and outcomes (Goles and Chin 2005; Koh et al. 2004); Relational mechanisms and outcomes (Kern and Willcocks 2000; Lee and Kim 1999).
	Trust development (Lander et al. 2004; Kern and Willcocks 2002)			

(continued)

Table 6 (continued)

Facet of social capital	Partner selection	Negotiation and Contract	Operations and Management	Evaluation of outsourcing relationship
Norms				
	Role of norms (Kern and Blois 2002)			
Obligations and Expectations				
Identification				

has the most influence on the level of shared knowledge. They found that transfer processes for explicit knowledge in an outsourcing context consist of two dimensions: the content dimension, which defines how content has to be interpreted, and the sender–receiver dimension of transfer, which defines interaction structures between parties. Furthermore, the results indicated that high levels of shared knowledge positively influence outsourcing performance. In another study, Lee and Kim (2003) proposed a causal model of outsourcing success in which three attitudinal variables (mutual benefits, commitment, and predisposition) are introduced as intervening variables into the relationship between behavioral variables (shared knowledge, mutual dependency, and organizational linkage) and outsourcing success. The role of shared codes and narratives in other phases of the outsourcing lifecycle needs to be studied to better understand the client-vendor relationship.

In the area of trust, the IT outsourcing literature has produced a plethora of work related to both trust and relationships. The initial role of trust in partnerships and outsourcing arrangements was studied through empirical approaches (e.g. Lee and Choi 2011; Babar et al. 2007; Cong and Chau 2007). Barthélemy (2003) articulated the impact of contractual hazards and trust on IT outsourcing outcomes, while Woolthuis et al. (2005) contributed to the debate on the relation between trust and formal contracts in the management of inter-organizational relationships. Goo and Nam (2007) studied contracts as a means to minimizing the costs arising from exchange hazards and helping to build initial relationships between the outsourcing parties. Trust is a characteristic of successful outsourced IS development projects (Sabherwal 1999). Langfield-Smith and Smith (2003) argued that firms actively use the relationship between management control systems and trust to achieve greater control in inter-firm relationships. Grover et al. (1996) investigated the relationship between trust as an element of partnership and the perceived achievement of benefits in the outsourcing relationship. Goles and Chin (2005) also placed trust as one of the key relationship factors in successful IT outsourcing relationships. Lee and Kim (1999) found trust to have a significant effect on outsourcing success. Kern and Willcocks (2000) studied relational mechanisms (including trust) that drive an outsourcing arrangement to success. From the IT outsourcing development perspective, Lander et al. (2004) described trust-building mechanisms throughout the course of an outsourced IT development

project. Kern and Willcocks (2002) posited that trust takes time to develop and in most cases it evolves with the appearance of a good track record for accomplishing stipulated terms in the outsourcing contracts.

Norm development in the client-vendor relationship has received little attention in IT outsourcing research. Kern and Blois (2002) examined the role of norms within networks by describing how BP Exploration outsourced its IT function to a network rather than to a market form of organization. The goal of the study was to understand how norms operate in outsourcing relationships and what they encompass. In fact, this paper reported an outsourcing arrangement failure due to the issue of "norms". There are other studies, which have acknowledged the importance of norms in IT outsourcing relationships (Gottschalk and Solli-Sæther 2006), but there appears to have been little done in this area. Researchers have not yet studied the role of norms in various phases of the outsourcing life-cycle.

There is no existing research related to obligations and expectations between client and vendor, and the vendor's identification with the client, and the role of these constructs in client-vendor relationships—a blank cell. The blank cells in Table 6 suggest that the social capital based framework indicates presently unexamined research areas, offering new opportunities for IT outsourcing researchers.

The Nahapiet and Ghosal (Nahapiet and Ghoshal 1998) framework pertains to a phenomenon internal to an organization. In the case of IT and business process outsourcing, development of intellectual capital is important for both vendor as well as for client; thus, development of social capital and intellectual capital will be across organizational boundaries. With non-commodity type IT outsourcing, knowledge sharing and knowledge creation is critical for long-term success. With the evolution of outsourcing practices, some companies expect vendors to make strategic contributions and also become innovative (Jayatilaka 2009; Wassenaar et al. 2009). In such a context, the development of intellectual capital based on successful development of social capital is critical. A valuable future research direction would be investigating the dynamics of social capital creation and maintenance and its impact on knowledge creation and knowledge appropriation. Additionally, it would be useful to do research on how the factors that form the dimensions of social capital develop over time. However, such research would require longitudinal studies and with the changing outsourcing ecosystem, it would be difficult to perform such longitudinal studies.

6 Summary and Conclusions

The concept of social capital has become increasingly popular in a wide range of social science disciplines including organization studies in general and information systems in particular. This paper attempts to (i) build a common understanding of the concept of social capital, (ii) use the social capital lens to take a closer look at the client/vendor relationships in IT outsourcing, and (iii) develop a framework for future research in IT outsourcing. The history of social capital shows that in the

nineteenth century, scholars used the concept to signify social wealth that could be shared cooperatively in a group or community. However, amongst contemporary researchers, social capital refers to use of social networks to generate capital for the group or community. Nahapiet and Ghoshal (1998) explained the social capital concept as consisting of structural, cognitive and relational dimensions, and demonstrated how social capital can generate intellectual capital for the organization.

In a limited manner, researchers have used the social capital concept in organization and IS research. The IT outsourcing context, as a case of inter-organizational research, lends itself to an application of social capital. Indeed, currently, there are significant opportunities in this area as evident from the number of research publications, e.g., Ye and Agarwal (2003) and George (2006), using the Nahapiet and Ghoshal (1998) framework to understand inter-organizational knowledge transfer between client and vendor. There are also case studies by Chou et al. (2006) and Rottman (2008) using social capital concepts in general. The social capital perspective can add more value to outsourcing research than what is currently available or utilized. We verified this by applying the Nahapiet and Ghoshal (1998) framework to the client and vendor relationship in the outsourcing life-cycle, generating a range of research questions regarding this relationship. We also mapped existing research on client/vendor relationships onto the framework. This enables the use of the specific cells, rows or columns of the framework (in Table 4) as individual research topics or use the entire table as the basis for a research program. Table 6 provides researchers with threads to existing research, and directions for new research. We believe that the use of this framework will help researchers and practitioners to uncover and analyze finer grained issues in client/vendor relationships, thereby facilitating the investigation and understanding of outsourcing arrangements.

Appendix

The following table shows similarities and differences between social capital and other forms of tangible capital such as physical, and economic.

Table A.1 Social capital versus other (tangible) forms of capital

Similarities	Differences
Long-lived asset; Investment of other resources with expectations of future outcomes (Putnam 1993)	Investments in its development is not amenable to quantification (Solow 1997)
Appropriable (Coleman 1988)	
Convertible (Bourdieu 1986)	
Can substitute for or complement other resources	
Need maintenance	
	collective ownership based on relationships (unlike other types of capital that can be owned by individuals) (Coleman 1988)

References

Adam, F., & Roncevic, B. (2003). Social capital: Recent debates and research trends. *Social Science Information Sur Les Sciences Sociales, 42*(2), 155–183.

Adler, P. S., & Kwon, S. W. (2002). Social capital: Prospects for a new concept. *The Academy of Management Review, 27*(1), 17–40.

Ainsworth, J. (2002). Social capital and international migration: A test using information on family networks. *American Journal of Sociology, 106*(5), 1262–1298.

Babar, M. A., Verner, J. M., & Nguyen, P. T. (2007). Establishing and maintaining trust in software outsourcing relationships: An empirical investigation. *The Journal of Systems and Software, 80*, 1438–1449.

Barthélemy, J. (2003). The hard and soft sides of IT outsourcing management. *European Management Journal, 21*(5), 539–548.

Blumenberg, S., Wagner, H. T., & Beimborn, D. (2009). Knowledge transfer processes in IT outsourcing relationships and their impact on shared knowledge and outsourcing performance. *International Journal of Information Management, 29*, 342–352.

Bourdieu, P. (1986). The forms of capital. In J. G. Richardson (Ed.), *Handbook of theory and research for the sociology of education*. Westport, CT: Greenwood Press.

Bourdieu, P. (1992). The purpose of reflexive sociology. In P. Bourdieu & L. J. D. Wacquant (Eds.), *An invitation to reflexive sociology*. Chicago: University of Chicago Press.

Burt, R. S. (1992). *Structural holes: The social structure of competition*. Cambridge, MA: Harvard University Press.

Burt, R. S. (2000a). The network structure of social capital. *Research in Organizational Behavior, 22*, 345–423.

Burt, R. S. (2000b). Decay functions. *Social Networks, 22*(1), 1–28.

Burt, R. S. (2004). Structural holes and good ideas. *American Journal of Sociology, 110*(2), 349–399.

Cecchini, S., & Raina, M. (2002). Warna: The case of an Indian rural community adopting ICT information technology in developing countries. *Newsletter of IFIP Working Group 9.4, 12*, 1.

Chiu, C. M., Hsu, M. H., & Wang, E. T. G. (2006). Understanding knowledge sharing in virtual communities: An integration of social capital and social cognitive theories. *Decision Support Systems, 42*(3), 1872–1888.

Chou, T. C., Chen, J. R., & Pan, S. L. (2006). The impacts of social capital on information technology outsourcing decisions: A case study of a Taiwanese high-tech firm. *International Journal of Information Management, 26*(3), 249–256.

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly, 35*(1), 128–152.

Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology, 94*, 95–120.

Coleman, J. S. (1990). *Foundations of social theory*. Cambridge, MA: Belknap Press of Harvard University Press.

Cong, Q., & Chau, P. Y., (2007). Does interpersonal trust also matter? Exploring the role of trust in successful IT outsourcing. In *Proceedings of the Fourth Hawaii International Conference on System Sciences*, IEEE, Hawaii.

Corley, K. G., & Gioia, D. A. (2011). Building theory about theory building: What constitutes a theoretical contribution*?*. *Academy of Management Review, 36*(1), 12–32.

Dewey, J. (1915). *The school and society* (rev ed.). Chicago: University of Chicago Press.

Dibbern, J., Goles, T., Hirschheim, R., & Jayatilaka, B. (2004). Information systems outsourcing: A survey and analysis of the literature. *The Data Base for Advances in Information Systems, 35*(4), 6–102.

Erickson, T., Halverson, C., Kellogg, W. A., Laff, M., & Wolf, T. (2002). Social translucence: Designing social infrastructure that makes collective activity visible. *Communications of the ACM, 45*, 4, 40–44.

Ganesan, S., & Hess, R. (1997). Dimensions and levels of trust: Implications for commitment to a relationship. *Marketing Letters, 8*(4), 439–448.

George, B. (2006). *Exploring information systems outsourcing: The role of social capital.* Unpublished Ph.D. Dissertation, University of Houston.

Ghoshal, S., & Moran, P. (1996). Bad for practice: A critique of the transaction cost theory. *Academy of Management Review, 21*(1), 13–47.

Goles, T., & Chin, W. W. (2005). Information systems outsourcing relationship factors: Detailed conceptualization and initial evidence. *The Data Base for Advances in Information Systems, 36*(4), 47–67.

Goo, J., & Nam, K. (2007). Contract as a source of trust-commitment in successful IT outsourcing relationship: An empirical study. In *Proceedings of the Fourth Hawaii International Conference on System Sciences* (pp. 1–10). Hawaii: IEEE.

Gottschalk, P., & Solli-Sæther, H. (2006). Maturity model for IT outsourcing relationships. *Industrial Management & Data Systems, 106*(2), 200–212.

Granovetter, M. S. (1985). Economic action and social structure: The problem of embededdness. *American Journal of Sociology, 91*, 481–510.

Grover, V., Cheon, M. J., & Teng, J. T. C. (1996). The effect of service quality and partnership on the outsourcing of information systems functions. *Journal of Management Information System, 12*(4), 89–116.

Hanifan, L. J. (1916). The rural school community center. *Annals of the American Academy of Political and Social Science, 67*(1), 30–138.

Hanifan, L. J. (1920). *The community center*. Boston: Silver Burdett.

Hiltz, S. R., & Turoff, M. (2002). What makes learning networks effective? *Communications of the ACM*, *45*, 56–59.

Hirschheim, R., Heinzl, A., & Dibbern, J. (Eds.). (2002). *Information systems outsourcing—enduring themes, emergent patterns, and future directions*. Berlin: Springer.

Hirschheim, R., Heinzl, A., & Dibbern, J. (Eds.). (2009). *Information systems outsourcing—enduring themes, global challenges, and process opportunities* (3rd ed.). Berlin: Springer.

Hirschheim, R., Klein, H. K., & Lyytinen, K. (1996). Exploring the intellectual structures of information systems development: A social action theoretic analysis. *Accounting, Management & Information Technology, 6,* (1/2), 1–64.

Jayatilaka, B. (2009). Reaching across organizational boundaries for new ideas: Innovation from IT outsourcing vendors. In R. Hirschheim, A. Heinzl, & J. Dibbern (Eds.), *Information systems outsourcing enduring themes, global challenges, and process opportunities* (3rd ed., pp. 255–275). Berlin: Springer.

Kankanhalli, A., Tan, B. C. Y., & Kwok-Kee, W. (2005). Contributing knowledge to electronic knowledge repositories: An empirical investigation. *MIS Quarterly, 29*(1), 113–143.

Kanter, R. M. (1994). Collaborative advantage: The art of alliances. *Harvard Business Review, 72*(4), 96–108.

Kern, T., & Blois, K. (2002). Norm development in outsourcing relationships. *Journal of Information Technology, 17*(1), 33–42.

Kern, T., & Willcocks, L. (2000). Exploring information technology outsourcing relationships: Theory and practice. *Journal of Strategic Information Systems, 9*, 321–350.

Kern, T., & Willcocks, L. (2002). Exploring relationships in information technology outsourcing: The interaction approach. *European Journal of Information Systems, 11*, 3–19.

Kogut, B., & Zander, U. (1996). What firms do? *Coordination, Identity, and Learning, Organization Science, 7*(5), 502–518.

Koh, C., Ang, S., & Straub, D. W. (2004). IT outsourcing success: A psychological contract perspective. *Information Systems Research, 15*(4), 356–373.

Kostova, T., & Roth, K. (2003). Social capital in multinational corporations and a micro-macro model of its formation. *Academy of Management Review, 28*(2), 297–317.

Lacity, M., Khan, S., & Willcocks, L. (2009). A review of the IT outsourcing literature: Insights for practice. *Journal of Strategic Information Systems, 18*, 130–146.

Lander, M. C., Purvis, R. L., McCray, G. E., & Leigh, W. (2004). Trust-building mechanisms utilized in outsourced is development projects: A case study. *Information & Management, 41*, 509–528.

Langfield-Smith, K., & Smith, D. (2003). Management control systems and trust in outsourcing relationships. *Management Accounting Research, 14*, 281–307.

Lee, J. N., & Choi, B. (2011). Effects of initial and ongoing trust in IT outsourcing: A bilateral perspective. *Information & Management, 48*, 96–105.

.

Lee, J. N., & Kim, Y. G. (1999). Effect of partnership quality on IT outsourcing success: Conceptual framework and empirical validation. *Journal of Management Information Systems, 15*(4), 29–61.

Lee, J. N., & Kim, Y. G. (2003). Exploring a causal model for the understanding of outsourcing partnership. In *Proceedings of the 36th Hawaii International Conference on System Sciences (HICSS'03).*

Lin, L., Geng, X., & Whinston, A. B. A. (2005). Sender-receiver framework for knowledge transfer. *MIS Quarterly, 29*(2), 197–219.

Lin, N. (1999). Building a network theory of social capital. *Connections, 22*(1), 28–51.

Mayer, K. J., & Nickerson, J. A. (2005). Antecedents and performance implications of contracting for knowledge workers: Evidence from information technology services. *Organization Science, 1*(3), 225–242.

Michell, V., & Fitzgerald, G. (1997). The IT outsourcing market-place: Vendors and their selection. *Journal of Information Technology, 12*, 223–237.

Miranda, S. M., & Kavan, C. B. (2005). Moments of governance in is outsourcing: Conceptualizing effects of contracts on value capture and creation. *Journal of Information Technology, 20*(3), 152–169.

Moran, P., & Ghoshal, S. (1999). Markets, firms, and the process of economic development. *Academy of Management Review, 24*(3), 390–412.

Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review, 23*(2), 242–266.

Oxendine, A., Borgida, E., Sullivan, J., & Jackson, M. (2003). The importance of trust and community in developing and maintaining a community electronic network. *International Journal of Human-Computer Studies, 58*(6), 671–696.

PricewaterhouseCoopers. (2009). Outsourcing comes of age: The rise of collaborative partnering. *Global Outsourcing*.

Putnam, R. D. (2000). *Bowling alone: the collapse and revival of american community*. New York, NY: Touchstone Books.

Putnam, R. D. (1993). The prosperous community: Social capital and public life. *American Prospect, 13*, 35–42.

Rindfleisch, A. (2000). Organizational trust and inter firm cooperation: An examination of horizontal versus vertical alliances. *Marketing Lettersm, 11*(1), 81–95.

Robison, L., Schmid, L. J., & Siles, M. E. (2002). Is social capital really capital? *Review of Social Economy, 60*, 1–24.

Rottman, J. W. (2008). Successful knowledge transfer within offshore supplier networks: A case study exploring social capital in strategic alliances. *Journal of Information Technology, 23*, 31–43.

Routledge, B. R., & Amsberg, J. V. (2003). Social capital and growth. *Journal of Monetary Economics, 50*, 167–193.

Sabherwal, R. (1999). The role of trust in outsourced is development projects. *Communication of the ACM, 42*(2), 80–86.

Schroiff, A., Beimborn, D., & Weitzel T. (2010). The role of social network structures in outsourced projects. In *eProceedings of the 5th International Research Workshop on Information Technology Project Management (IRWITPM)*, St. Louis, Missouri, December 11.

Schumpeter, J. A. (1934). (Reprinted in 1962.). *The theory of economic development: An inquiry into profits, capital, credit, interest and the business cycle.* Cambridge, MA: Harvard University Press.

Smith, M., (2002). Tools for navigating large social cyberspaces. *Communications of the ACM, 45*(4), 51–55.

Solow, R. M. (1997). Tell me again what we are talking about. *Stern Business Magazine*, *4,* 1.

Stanko, M. A., & Calantone, R. J. (2011). Controversy in innovation outsourcing research: Review, synthesis and future directions. *R&D Management, 41*(1), 8–20.

Szulanski, G. (1996). Exploring internal stickiness: Impediments to the transfer of best practice within the firm. *Strategic Management Journal, 17*(Winter Special Issue), 27–43.

Wasko, M. M., & Faraj, S. (2005). Why should i share? Examining social capital and knowledge contribution in electronic networks of practice. *MIS Quarterly, 29*(1), 35–57.

Wassenaar, A., Govindaraju, R. & Kijil, B. (2009). In context outsourcing: Between solution making and context making. In R. Hirschheim, A. Heinzl, & J. Dibbern (Eds.), *Information Systems Outsourcing Enduring Themes, Global Challenges, and Process Opportunities* (3rd Edn., pp. 241–253). Berlin: Springer.

Willcocks, L., Hindle, J., Feeny, D., & Lacity, M. (2009). Managing knowledge in outsourcing: Cases in financial services. In L. Willcocks & M. Lacity (Eds.), *The practice of outsourcing: from information systems to BPO and offshoring*. London: Palgrave.

Woolcock, M. (1998). Social capital and economic development. *Theory and Society, 27*, 151–208.

Woolthuis, R., Hillebrand, B., & Nooteboom, B. (2005). Trust, contract and relationship development. *Organization Studies, 26*(6), 813–884.

Ye, F. & Agarwal, R. (2003). Strategic information technology partnerships in outsourcing as a distinctive source of information technology value: A social capital perspective. In *ICIS 2003 Proceedings.*

Zaheer, A., Gözubuyuk, R., & Milanov, H. (2010). It's the connections: The network perspective in interorganizational research. *Academy of Management Perspectives, 24*(1), 62–76.

Part VII
Crowdsourcing and Open Platforms

New Capabilities: Can IT Vendors Leverage Crowdsourcing?

Dorit Nevo, Julia Kotlarsky and Saggi Nevo

Abstract Technological advancements enable new sourcing models in software development such as cloud computing, software-as-a-service, and crowdsourcing. While the first two are perceived as a re-emergence of older models (e.g., ASP), crowdsourcing is a new model that creates an opportunity for a global workforce to compete with established service providers. Organizations engaging in crowdsourcing need to develop the capabilities to successfully utilize this sourcing model in delivering services to their clients. To explore these capabilities we collected qualitative data from focus groups with crowdsourcing leaders at a large technology organization. New capabilities we identified stem from the need of the traditional service provider to assume a "client" role in the crowdsourcing context, while still acting as a "vendor" in providing services to the end client. This paper expands the research on vendor capabilities and IS outsourcing as well as offers important insights to organizations that are experimenting with, or considering, crowdsourcing.

Keywords Outsourcing · Crowdsourcing · Capabilities · Qualitative research

This paper was presented at the Thirty Third International Conference on Information Systems (ICIS), Orlando 2012.Work on this project was conducted at the Schulich School of Business, Toronto, Canada.

D. Nevo
Rensselaer Polytechnic Institute, 110 Eighth Street, Troy, NY, USA
e-mail: nevod@rpi.edu

J. Kotlarsky (✉)
Aston Business School Aston University, Birmingham, UK
e-mail: j.kotlarsky@aston.ac.uk

S. Nevo
University at Albany, 1400 Washington Ave, Albany, NY, USA
e-mail: snevo@albany.edu

R. Hirschheim et al. (eds.), *Information Systems Outsourcing*, Progress in IS,
DOI 10.1007/978-3-662-43820-6_19

1 Introduction

With increasing globalization and technological advancements outsourcing has become a daily practice for many organizations. Outsourcing implies contracting with a third party (a service provider) not directly controlled by the client organization to accomplish work for a specified length of time, cost and level of service (Lewin and Peeters 2006). Outsourcing is fueled by service providers with strong technological capabilities and access to a global talent pool (e.g., Carmel 2006; Oshri et al. 2007), and by technological advancements that enable new sourcing models such as cloud computing, software-as-a-service (SaaS), and crowdsourcing (Gefen and Carmel 2008; Oshri et al. 2011). While cloud-services, SaaS and other hosted services are perceived as a re-emergence of older models (such as the Application Service Provision (ASP) model), crowdsourcing is a new sourcing model that has created an opportunity for a global workforce to compete with established outsourcing providers. However, organizations engaging in crowdsourcing need to develop the necessary capabilities to successfully manage this new sourcing model.

Crowdsourcing implies outsourcing a job to an undefined, generally large group of people in the form of an "open call" (Howe 2008). This sourcing model is increasingly being adopted and a number of new business ventures have emerged through crowdsourcing (Oshri et al. 2011). Crowdsourcing requires initial investment on a voluntarily basis, as interested parties (individuals or organizations) need to deliver something according to the "open call" and compete with others. Under most crowdsourcing arrangements, only the "winning" idea or contribution is paid.

The growing popularity of these Internet-based sourcing models stimulates a range of reactions and mixed feelings in the outsourcing community. Some service providers do not pay attention to the fact that an "unknown workforce" is delivering jobs that could be contracted to established players. Among those who realize the increasing competition, some attempt to utilize this "unknown workforce" for their benefit. In particular, during the economic downturn, when reducing headcount is seen as one of the obvious solutions to reduce costs, especially fixed costs, a possibility to tap into a global talent pool and employ required skills on an ad hoc basis creates an interesting proposition for established service providers.

While the expected economic benefits of this proposition are significant, it is not clear what efforts are required from established software service providers to be able to successfully realize this opportunity. In particular, in this paper we study the crowdsourcing phenomenon with focus on the capabilities required for service providers to successfully utilize Internet-based sourcing models that enable them to employ crowdsourcing in delivering services to their clients.

2 Capabilities Under Traditional Outsourcing Models

In the literature, outsourcing capabilities have been mainly studied from the client perspective (e.g., Lee 2001; Nicholson and Sahay 2001; Goles 2006; Willcocks and Feeny 2006), focusing on capabilities that clients need to develop in-house to ensure the successful outcomes of the outsourcing arrangement. The most frequently studied capabilities are Business Process Management Capability and Supplier Management Capability (Lacity et al. 2011). The former refers to clients' ability to manage a business process themselves, before outsourcing it. This capability has been associated with greater outsourcing success (e.g., Duan et al. 2009; Saxena and Bharadwaj 2009). The latter implies clients' ability to manage outsourcing providers and encompasses capabilities such as contract management and relationship management (Feeny and Willcocks 1998; Kishore et al. 2003; Rottman and Lacity 2006; Sander at al. 2007). Client sourcing capabilities, which are required to ensure successful delivery of services, are also referred to as "the retained organization" (Oshri et al. 2011; Willcocks and Graig 2008).

In contrast, service providers' capabilities received limited attention in the literature. The most influential work is by Levina and Ross (2003) who studied large IT vendors[1] and distinguished between three types of operational capabilities, that is, capabilities involved in the provision of a service or a product (Jarvenpaa and Mao 2008):

1. Client-specific capabilities: These are related to the routines and resources that align the vendor's practices and processes to the client's goals. More specifically, these capabilities are associated with the knowledge that a service provider must have of the client's business model and industry, as well as of the specifics of the client's operations.
2. Process capabilities: These are concerned with task delivery routines and resources that accomplish software design, development, and execution. Six Sigma and the capability maturity model (CMM) are some of the better-known methodologies that aim to improve software development processes.
3. Human resource capabilities: These are related to recruitment, training, and mentoring practices; designing jobs that will expose individuals to a variety of tasks and thus enable them to broaden their skills; and developing performance appraisal and compensation systems.

Levina and Ross (2003) argue that these three operational capabilities are mutually reinforcing and need to be simultaneously present. In the offshoring context, Ethiraj et al. (2005) found that higher levels of client-specific and process management capabilities lead to higher levels of firm performance.

[1] We use the terms "vendor" and "service provider" interchangeably. We acknowledge that, while practitioners prefer the latter term, in the academic literature, in particular IS outsourcing literature, the term "vendor" is commonly used.

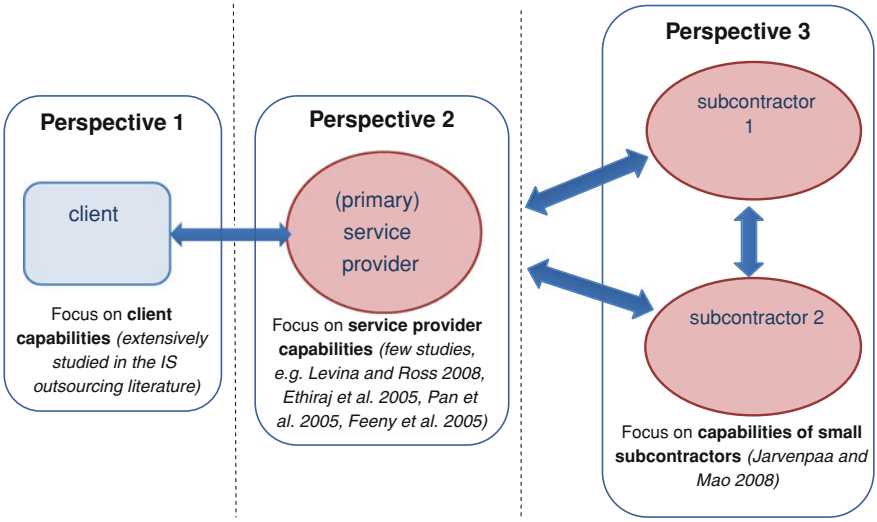


Fig. 1 Outsourcing literature on capabilities: various perspectives

Complementary to these works is a more fine-grained view of vendor capabilities developed by Feeny et al. (2005) that identifies 12 capabilities that service providers could leverage into three competences, as seen through the eyes of the clients: delivery competency that reflects the supplier's ability to respond to the client's ongoing needs; transformation competency indicating the supplier's ability to deliver radically improved service in terms of quality and cost; and relationship competency reflecting the supplier's willingness and ability to align its business model to the values, goals, and needs of the client.

Among the few studies that focused on vendor capabilities, Jarvenpaa and Mao (2008) studied operational capabilities using the mediated outsourcing model (e.g., Ethiraj et al. 2005; Mahnke et al. 2008; Rajkumar and Mani 2001). This model implies a mediating role by one service provider who is working directly with a client (end user/recipient of the service) and as well as with other service providers supplying some services to the primary (or "middleman") vendor. Such an arrangement may take a form of subcontracting (when the primary service provider contracts a third party—one or more service providers) (Jarvenpaa and Mao, 2008) or intermediation (brokering) such as legal services, moderating disparities between client and service provider, or staff augmentation by manpower agencies (Mahnke et al. 2008).

Figure 1 illustrates the focus of extant research on outsourcing capabilities, highlighting the three perspectives discussed above: perspective 1 depicts research on client capabilities (most widely discussed in the literature) in a client-vendor environment; perspective 2 depicts the focus of the few studies on the capabilities of large service providers providing services using their own resources; and

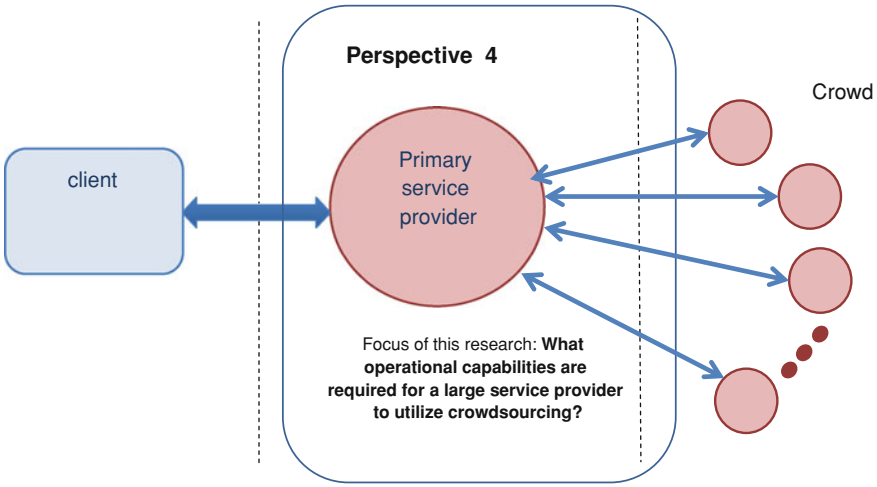


Fig. 2 The focus of this research

perspective 3 illustrates a mediated outsourcing model and focuses on the capabilities of the *subcontractor*.

Yet, none of these perspectives focuses on the *service provider* who is using the crowd as its subcontractors when delivering services to the client. In the mediated model (perspective 3) this would be the primary service provider using the crowd instead of subcontractor organizations. However, the focus of Jarvenpaa and Mao (2008), who studied the mediated model, is not the primary service provider. Instead, they focused on the capabilities of subcontractors in the "subcontractor-primary vendor" relationship. Furthermore, it is likely that the characteristics of the crowd are different to those of organizational subcontractors, studied in perspective 3. Crowd attributes, motivation, composition, and a host of other factors may play a role in defining the capabilities needed to successfully sustain the relationship with the primary service provider.

Figure 2 shows a fourth perspective—that is proposed in this paper and reflects the crowdsourcing model. The focus of this perspective is the primary service provider who faces the client on one side and the *crowd* on the other. Consequently, we place the focus on the capabilities needed by the *primary service provider* (i.e., the middleman), and argue that this service provider needs to combine "vendor capabilities" required for delivery of services to the end client with "client capabilities" required to successfully manage delivery of products/services from the crowd, and integration of these deliverables into the service provided to the end client. Therefore, our main research question is: *What operational capabilities are required for a large service provider to utilize crowdsourcing in service delivery?*

2.1 Crowdsourcing

Supported in large by the public Internet infrastructure, crowdsourcing is commonly conceptualized simply as outsourcing a task to the crowd in the form of an "open call" (Howe 2008). The nature of the task may vary from highly creative tasks to specialized problem-solving to simple labor-intensive tasks (Brabham 2010; Doan et al. 2011; Greengard 2011; Poetz and Schreier 2012; Wexler 2011). The composition and structure of the crowd has also been the focus of several studies, defining it as a network (Brabham 2010), a group (Horton and Chilton 2010), a community (Yang et al. 2008; Whitla 2009), or simply a composite of relatively anonymous and independent individuals (Haythornthwaite 2009).

Crowdsourcing has been studied in many contexts and identified benefits of crowdsourcing include improved problem-solving (Doan et al. 2011), cost reduction (Wexler 2011), and new perspectives of what firms can do (Jouret 2009). From the crowd's perspective, various reasons have been proposed to account for why the crowd engages in crowdsourcing, including monetary incentives (Geisler et al. 2011; Wexler 2011), but also personal and social rewards (Brabham 2010; Cook 2008) and crowdsourcing ideology (Proulx et al. 2011).

To leverage the benefits offered by crowdsourcing, potential customers (individuals and organizations) need to develop new capabilities that are tailored to the unique characteristics of crowdsourcing competitions, the tasks they entail, and the mindset of the "crowd" (to reflect incentives that motivate individuals to participate). Such capabilities would facilitate management of the work completed by the crowd and enable integration with existing practices of the buyer. In this paper we aim to explore such capabilities in one crowdsourcing context.

The crowdsourcing context studied in this paper is software development. We investigate a large technology service provider's venture into crowdsourcing and the lessons learned thus far. The focal organization is a large multinational organization, a leader in software development and provision of IT outsourcing services. It has tremendous outsourcing experience and a highly qualified workforce around the globe. Through focus groups with crowdsourcing leaders within the organization we aim to explore what new capabilities are needed to effectively harness the crowdsourcing model when delivering services to the end client.

3 Research Methodology

This work is phenomenological in nature with the phenomenon investigated being the introduction of crowdsourcing into service providing organizations. The primary purpose of this paper is hence to provide a descriptive account of the phenomenon with its key emerging themes and the behaviors and practices that surround it. These descriptions are provided from the perspective of the primary

service provider, and using multiple focus groups for data collection. Adopting this approach allows us to apply "the scientific attitude" to study "the natural attitude of everyday life" taken by the practitioners (Mårtensson and Lee 2004).

3.1 Focus Groups

To identify the major themes related to service provider capabilities under the crowdsourcing model we collected exploratory qualitative data from focus group sessions. Focus groups are particularly useful when our knowledge of a phenomenon is limited (Klaus and Blanton 2010), and the insights obtained from focus groups are based on consistent patterns of responses of carefully selected participants (Parasuraman et al. 1991). Focus groups are a common exploratory method in IS research (e.g., Jarvenpaa and Lang 2005; Joshi and Kuhn 2007; Otondo et al. 2009).

This research was conducted at a large multinational technology firm that is one of the leading IT service providers (among the top ten worldwide). This organization has extensive outsourcing experience providing services as a primary provider, and recently engaged in several crowdsourcing initiatives. The focus groups were conducted approximately six months after the launch of the crowdsourcing initiative. Four broad and open-ended questions were created (shown in the next section) to develop better understanding of new crowdsourcing capabilities. A total of five focus group discussions, ranging from 6 to 12 members each (48 individuals in total), were conducted via a combination of a teleconference and an online group support software. The majority of respondents were project managers (70 %) or lead architects (16 %) and the remaining participants were business analysts, delivery managers, developers, or IT specialists. Respondents were members of different project teams within the organization and were all involved with crowdsourcing planning and execution. Participants were selected for this study to represent teams with high crowdsourcing success as well as teams with low success, as measured by the organization. This allowed for different perspectives on crowdsourcing capabilities.

Each focus group session lasted approximately 90 min. The discussion began with the facilitator (a senior executive in the organization) describing the first question to participants over the conference line as well as posting it on the virtual discussion board. This was followed by a 15 min period in which each participant typed his or her response on the virtual discussion board. Each group member was able to see all other responses immediately, as they were typed by other focus group participants.

A valuable aspect of the focus group research method is its ability to leverage the interaction among participants to identify common reactions, experiences, and opinions on the focal topic (Jarvenpaa and Lang 2005). Hence, the focus group sessions were designed to support such interactions in two ways. First, group members were able to comment on each other's inputs through discussion threads

on the virtual board. The facilitator tracked responses as they were entered and allowed additional input time if needed. After all responses were entered, the facilitator verified that the answers were meaningful and did not require further clarification, and that all comments from other group members were entered.

Second, once all responses and comments were inputted the facilitator initiated a discussion over the conference phone line to elicit further comments and experiences. The facilitator typed these comments on the discussion board during the discussion and ensured that focus group participants reviewed and approved the discussion content. Upon completion of the follow-up discussion the next question was posted on the board followed by another 15 min answer period, and so forth for a total of four questions.

The first author participated (passively) in the focus group discussions by observing the questions and answers but otherwise remaining uninvolved. As the questions and answers were all recorded digitally, it was not necessary to transcribe them prior to analysis.

3.2 Data Analysis

Data were analyzed by two of the authors independently to identify the key themes and descriptions emerging from the focus groups' discussions. At the first stage, the two coders reviewed all comments and inputs by focus group participants to create a single file of all the comments from the five groups. Individual comments were then reviewed by each of the coders separately and assigned individual codes (for example, "involve team" was used to code a comment made about getting team members involved in crowdsourcing events, and "low submissions" was used to code a comment made about the low number of submissions to crowdsourcing competitions). Each coder then reviewed the codes to ensure consistency and uniqueness. At the second stage the two coders compared and discussed their coding of the comments until agreement was reached. During this stage codes that were perceived by the authors as representing the same phenomenon were grouped into higher levels categories that are presented in the tables below. A third author then reviewed and matched the lists of codes and categories again to ensure consistency in the interpretation of the focus groups' data. In addition to the analysis the coders also counted the frequency of each category's appearance in the data to provide some insight on the relative importance of topics.

3.3 Crowdsourcing Initiative: Background

The crowdsourcing initiative at the study organization began internally, as the organization was looking for ways to procure short cycle work without retaining new team members. The initiative was launched in February 2011. Consequently

members of teams across the organization who had free time were encouraged to register for crowdsourcing work. Project managers first identified specific work that was sufficiently componentized and thus perceived as suitable for crowdsourcing. They then put this work out as an open call (internally referred to as an "event") using an online platform and invited developers to compete on the event. In defining events project managers also defined the event's scope, schedule, and compensation. After experiencing crowdsourcing internally the organization expanded the crowdsourcing channel outside organizational boundaries, using a crowdsourcing platform and partner to locate qualified developers for competitions. Similar to the earlier (internal) approach, events were created by project managers with a defined scope, schedule, and compensation and made available for outside developers, through the crowdsourcing platform, to compete on.

4 Findings: Insights from Focus Groups

4.1 Question 1: What Tasks are Best Suited for Crowdsourcing Competitions?

The first question focused on task definition which is the foundation of crowdsourcing events. This question is not related directly to capabilities required to manage crowdsourcing, but it gave us an opportunity to understand the nature of tasks that crowd-management capabilities should focus on. Our analysis reveals that responses from participants focused on two aspects of the task: *type* and *characteristics*. In terms of type, the most common answer was that development tasks are best suited for crowdsourcing, followed by documentation and labor-intensive tasks (such as bug fixes), and finally idea generation. In terms of characteristics, four specific characteristics emerged in the responses to this question: the task has to be a stand-alone task, off the critical path, well-defined, and not requiring domain knowledge. Table 1 provides a summary of the answers given to this question and supporting quotes.

4.2 Question 2: What are the Best Practices Observed thus Far?

The key themes emerging in this question were around proper management and planning of the crowdsourcing initiative. The first theme focused on the need for a team effort in making competitions successful. All team members need to be involved and dedicated roles should be assigned for competition management. The second theme dealt with detailed practices around running events and competitions. Reuse emerged as important with focus group respondents highlighting the benefits

Table 1 Best software development tasks for crowdsourcing

Theme	Categories (frequency)	Exemplary quotes
Task characteristics	Stand-alone task (25 of the 48 participants)	"Stand-alone components that have simple interface with the rest of the application"; "Work for parts of the application which can be easily isolated from the rest of the application"
	Clear definition (14 of the 48 participants)	"You need well-defined specs, with a well-defined spec you can achieve successful development"; "I agree! Clear and well-defined specs are the key to any event!"
	Non-critical path (8 of the 48 participants)	"Low priority 'nice to have' requirements that are not on the project critical path"; "work that is not critical"
	No domain knowledge needed (7 of the 48 participants)	"Those sub-components that require little or no business domain knowledge"; "Tasks where no business knowledge is required to accomplish it"
Task type	Development (17 of the 48 participants)	"New development which is not tightly coupled with existing functionality"; "competitions are best suited for component development and assembly of components"
	Labor intensive (e.g., bug fixes and documentation) (10 of the 48 participants)	"Labor intensive work which is relatively simple to execute requiring basic skills"; "manual tasks which take up developer's time"
	Idea generation (2 of the 48 participants)	"Idea generation—how would you address this problem"

of reusing specifications and collectively managing and planning events. In addition, proper scheduling and tracking were identified as important, underscoring the external nature of crowdsourcing. The third theme focused on managing external crowdsourcing players (specific individuals from the "crowd"), reusing players where possible, and ensuring that proper support is provided (Table 2).

4.3 Question 3: What are the Key Challenges you have had to Overcome?

Three themes emerged when challenges to crowdsourcing were discussed. The majority of respondents brought up the resource constraint, highlighting the cost and time-consuming nature of setting up and managing events. An important challenge concerned the fit of crowdsourcing with existing methodologies, in particular agile (cf. Cao et al. 2009), and with existing applications. Specifically,

Table 2 Best practices for software development crowdsourcing

Theme	Categories (frequency)	Exemplary quotes
Team management	Involve team (11 of the 48 participants)	"We are getting more team members involved to help manage their own events, which spreads out the effort across a larger group of people"; "We have a weekly meeting as a team to discuss what's worked, what hasn't and what's coming up"
	Dedicated staff/manager (8 of the 48 participants)	"Getting someone to create and manage the events"; Have dedicated team members to support and manage competitions for a project"
Competition management	Collective management (7 of the 48 participants)	"When preparing for a 'series' of events, we prepare all the event documentation at one time so we don't repeat that same action over and over again"; "Create a month's worth of competitions at once. Players get more involved when they see a long stream of continuous employment"
	Reuse (specifications) (10 of the 48 participants)	"Reuse specifications from previous successful competitions as a baseline when creating new competitions"; "Reusable templates for specifications allow team members to write specifications more quickly"
	Scheduling (9 of the 48 participants)	"When scheduling events, leave 'white space' between the end of one competition and the beginning of the next to account for delays in completion/final fix"; "Strong emphasis on intelligent scheduling of Contest deliverables to assure success and avoid penalties"
	Track progress/status (9 of the 48 participants)	"Centralized tracking makes it easier to see overall progress, and then actions could be taken afterwards"; "In order to improve the successful completion of events, I check on the status of each event daily so that my team does not miss any phase deadlines"
	Good specifications (8 of the 48 participants)	"Specification document should be very clear and expected output should be clearly mentioned"; "Quality of the specification is key"
Players' management	Reuse (players) (3 of the 48 participants)	"Nurture relationships with players. Create a pool of return players. Notify them in advance of upcoming work"
	Communications & support (4 of the 48 participants)	"Communicating with the players and answering most of queries"
	Encourage participation (3 of the 48 participants)	"Give a catchy Headline for the requirement which will attract the audience"

Table 3 Challenges

Theme	Categories (frequency)	Exemplary quotes
Resources	Cost and time (18 of the 48 participants)	"Creating sufficient technical documentation to describe the problem and solution can often take more time than actually doing the work itself"; "Crowdsourcing is not cheap, there are fixed costs and then there is the cost of your architect to build and answer questions and the developers who have to put the pieces together. Our customers are experiencing severe budget cuts. The combination is not pleasant"
Fit	Fit with methodologies (8 of the 48 participants)	"As the Client gets used to Agile life cycle, it's hard to define complete stories in advance"; "Completion of events in Agile iterations is not achievable"
	Fit with applications (10 of the 48 participants)	"Existing applications are difficult to decompose to remove dependencies and focus on a specific problem"; Enterprise applications are not a good fit due to licensing agreements, the tightly coupled transport system for moving code from development to test, the expense to the clients of having two dev and test environments"
State of Submissions	Quality of submissions (8 of the 48 participants)	"Some of our winning submissions have been just marginally acceptable"; "Receiving solutions that are not acceptable"
	Skill availability (4 of the 48 participants)	"Technical skills not available in the market"
	Number of submissions (7 of the 48 participants)	"Competitions launched which rare skills don't get many submissions and tend to fail"; "You can expend a lot of time and money and get no responses"

the fast-paced nature of agile was seen as critically mismatched against the careful planning requirements of crowdsourcing. Finally, a "state of the submissions" theme emerged when the focus groups discussed the quality and availability of skills and of resulting submissions (Table 3).

4.4 Question 4: What Changes are Recommended Going Forward?

The final question asked focus group participants to reflect on how they would change existing work practices to better fit crowdsourcing. Here, convergence on three specific themes reflected many of the challenges and suggestions highlighted in previous responses. Focus group participants raised three important change categories that can improve the crowdsourcing experience: design for crowdsourcing, plan for crowdsourcing, and stakeholder buy-in (Table 4).

Table 4 Suggested changes for how to better fit crowdsourcing

Theme	Categories (frequency)	Exemplary quotes
Design for crowdsourcing	(13 of the 48 participants)	"During design—look to compartmentalize your code better"; "Try to make new applications more modular"; "Develop a component model in concept phase, plan to develop some components using competitions as part of project very early in the cycle"; bring crowdsourcing into the lifecycle earlier—see where it will be able to fit in"
Plan for crowdsourcing	Project (12 of the 48 participants)	"When planning project and costs—need to estimate in the cost of crowdsourcing to overall project costs"; "Recognize event managing as a specific skill and role when planning"; "Ensure that the budgets allow for the cost of crowdsourcing"
	Competition (7 of the 48 participants)	"Allow additional time between the end of a 'parent' competition and the start of any 'child' competitions to allow for delays"; "Plan the event well in advance so that we have sufficient time to use the outcome in project"
Stakeholders buy-in	Customers (6 of the 48 participants)	"Ensure customer buy in"; "Work closely with your customer to ensure they have a sufficient backlog of requirements to avoid having to send must haves through competitions"
	Team (3 of the 48 participants)	"Ensure the teams which will support the systems after it is deployed are involved in the process to ensure a smooth knowledge transfer"; "Share the crowdsourcing vision to team"; "Get more buy-in from the existing team"

We have thus far discussed our insights obtained from the focus groups and characterized the crowdsourcing phenomenon and its implications to software service providers. We identified key themes in the responses for each question and provided supporting quotes and frequencies of occurrence. In the following section we discuss these findings using the foundations introduced earlier from the literature on service providers' capabilities under different sourcing models. We compare our findings with those of previous studies and identify the new capabilities emerging from the crowdsourcing model

5 Analysis and Discussion of Findings

We have compared themes that emerged from the focus groups with client and vendor capabilities identified in the outsourcing literature (as discussed earlier in the paper). In Table 5 we discuss outsourcing capabilities identified in the literature through the lens of a particular case of a large service provider attempting to

Table 5 New capabilities for service providers using crowdsourcing

Capabilities under traditional models (as identified in the literature)	Capabilities in a crowdsourcing model
Client-specific capabilities	This capability is expanded when service provider is using crowdsourcing, as the client specific knowledge must trickle down to the crowd
• Routines, resources and knowledge that a service provider must have of the client's business model and industry, as well as of the specifics of the client's operations	The service provider is now responsible for ensuring that crowdsourcing players (who participate in competitions) have two layers of client-related knowledge in the domains that the "crowd" is responsible for:
	1. Knowledge of the end client and their needs
	2. Knowledge of the service provider organization and the project as a whole
	While the first layer is similar to the previously identified capability, the second layer is introduced by the addition of the crowd as a subcontractor. Since work is split between the primary service provider and the crowd, crowd members now require "provider-specific" skills
	It is the responsibility of the primary service provider to ensure that such knowledge exists within the crowd or, alternatively, to select crowdsourcing events that do not require vendor-specific knowledge
Process capabilities	The nested nature of crowdsourcing work, which presents a project within a project, requires fit between internal and crowdsourced components of the work. Hence another level of planning is required to ensure such fit
• Task delivery routines, resources and methodologies that help to accomplish software design, development, and execution	The service provider's process capabilities are thus expanded to include, not only the primary process vis-à-vis the client, but also the secondary process of the crowdsourced work
	Managing the crowdsourcing process requires that:
	1. The proper technology infrastructure is made available to crowdsourcing players
	2. Careful planning for crowdsourcing ensures resources and schedules are appropriate
	3. The design of the project takes crowdsourcing into account to ensure that work is componentized and suitable for crowdsourcing
	4. Fit exists between internal methodologies and crowdsourcing to ensure limited friction

(continued)

Table 5 (continued)

Capabilities under traditional models (as identified in the literature)	Capabilities in a crowdsourcing model
	at the interface between internal and crowdsourced work
Human resource capabilities	Though the original human resource capabilities introduced by Levina and Ross (2003) referred to the internal staff within the vendor organization, when a service provider employs the crowd these human resource capabilities should be extended to external human resources (from the "crowd")
• Recruitment, training, and mentoring practices; designing jobs that will expose individuals to a variety of tasks and thus enable them to broaden their skills; and developing performance appraisal and compensation systems	In particular, the service provider should be able to locate and manage crowd members who are of value to the organization (i.e., individuals that have unique skills that the service provider wants to utilize in the future) and be able to:
	1. Ensure that the crowd skills complement, rather than interfere with, internal skills
	2. Broaden these skills to accommodate better fit with the context in which the service provider operates
	3. Motivate skilled crowd members to remain loyal to the service provider and continue bidding for new crowdsourcing work
Supplier management capabilities	Using crowd as subcontractors puts a primary service provider in the position of a "client" who needs to manage their suppliers. Thus the notion of "supplier management capabilities" introduced in the outsourcing literature also applies to service providers who engage in crowdsourcing, in particular:
• A *client's* ability to manage outsourcing providers. This encompasses capabilities such as contract management and relationship management	1. Internal team members are required to accommodate crowdsourcing delays and problems. Team members' involvement in all stages of the crowdsourcing lifecycle is crucial to facilitate workflow
	2. The crowd represents a new stakeholder group that the service provider needs to manage. The service provider needs to invest in building relationships with individuals from the crowd and reuse players as possible
Architectural capabilities	In the crowdsourced model this capability requires the service provider organization to componentize work so that it can be effectively and seamlessly crowdsourced
• A *client's* architectural and design knowledge of the service (Willcocks and Graig 2008)	

utilize crowdsourcing in service delivery. This is followed by a broader view discussion of the implications for capabilities required for a primary service provider that aims to utilize crowdsourcing when delivering services to the clients.

Overall, the combination of capabilities discussed in Table 5 would enable a service provider to manage the three stakeholder groups that play an important role in crowdsourced projects:

1. The client who is ultimately the most important stakeholder, with client buy-in needed to ensure their satisfaction. Not all clients that contract a specific organization may agree to have their work crowdsourced.
2. Internal team members who need to design, facilitate and manage crowdsourced work, as well as integrate crowdsourced deliverable into the services delivered to the end client.
3. The crowd who needs to have appropriate support (e.g., infrastructure) from the primary service provider, as well as to be motivated to respond to crowdsourcing calls.

5.1 Implications for Capabilities in a Crowdsourcing Model

Vendor capabilities identified and studied in earlier literature (e.g., Ethiraj et al. 2005; Jarvenpaa and Mao 2008; Levina and Ross 2003) need to be adjusted in the crowdsourcing model to reflect the need for the primary service provider to manage the crowd. Because the crowd is not a typical subcontractor, the responsibility to deliver to client expectations and, consequently, the burden of ongoing management of service delivery (for both primary service provider as well as the crowd) falls on the primary service provider organization. This means that the service provider is responsible for communicating relevant client knowledge to the crowd, as well as coordinating the process to seamlessly integrate crowdsourced work.

Our table above discusses how the three formerly identified vendor capabilities of (1) client-specific capabilities, (2) process management capabilities, and (3) human resource capabilities, should be modified under the crowdsourcing model. Specifically, the service provider now needs to open its infrastructure to crowdsourcing players, to incorporate crowdsourcing in the design and planning of projects, and to ensure fit between different development methodologies. Furthermore, human resource capabilities need to be extended to include external individuals from the crowd and to nurture their unique skills and motivate them to engage in future crowdsourcing work. The service providers also needs to *select crowd players with "organization-specific" skills,* so that both the crowd and the primary service provider can understand each other in a similar way as a primary service provider can understand the end client.

Beyond the above capabilities, a primary service provider needs to adopt capabilities traditionally associated with a client in prior literature, in order to

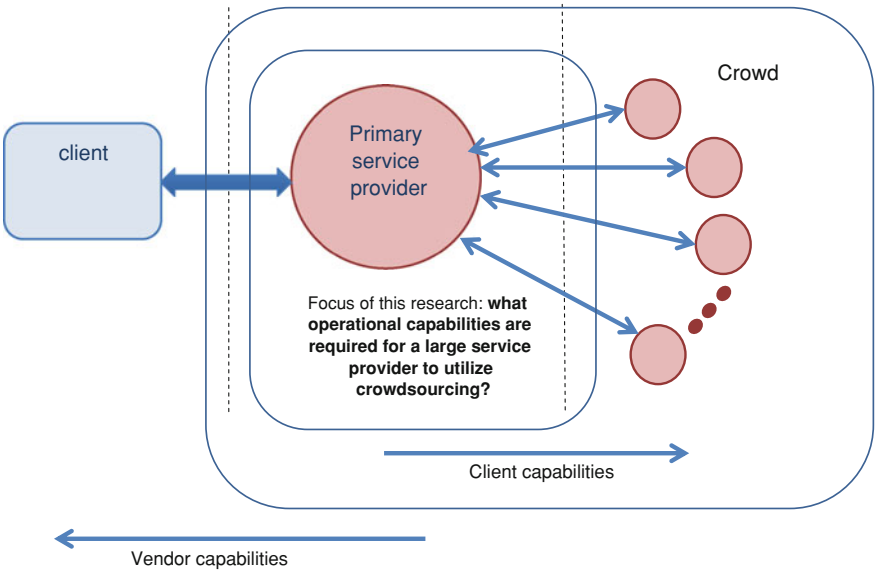


Fig. 3 The crowdsourcing perspective

accommodate the service provider's new role as a client in the crowdsourcing market. However, these capabilities take a slightly different shape when considered from a primary service provider perspective. In particular *supplier management capabilities* which encompass contract management, relationship management, and service provider development (Feeny et al. 2005; Willcocks and Lacity 2009) are imperative for the primary service provider's success in the crowdsourced model. These capabilities are particularly important if the service provider wishes to develop longer-term relationships with successful crowd players. In addition, similar to the above "process management capabilities", the primary service provider needs to have strong *architectural and design knowledge* (Willcocks and Graig 2008) to be able to componentize work so that it can be easily crowdsourced.

The above discussion is broadly illustrated in Fig. 3 below, which is an adaptation of Fig. 2. In Fig. 3 we show the crowdsourcing model with its two layers. The internal relationship is the one between the primary service provider and the crowd, in which the service provider assumes the role of the client facing the crowd, and requires the two client capabilities discussed in the above paragraph and in Table 5. The external relationship is between the primary service provider and the end client, and in this relationship the service provider requires the vendor capabilities discussed in Table 5 and the following paragraphs.

5.2 Dealing with Uncertainty: A New Capability

A very important aspect of crowdsourcing models is the element of uncertainty introduced by the nature of dealing with the crowd. Participants in our focus groups discussed uncertainty around things such as the skills available within the crowd, the number of submissions and their quality and timing. This problem brings up an interesting trade-off that merits further attention in studying the crowdsourcing phenomena. On the one hand the appeal of crowdsourcing is that it harnesses the "wisdom of the crowd" and opens the organization to new skills not always available within. On the other hand, the crowd is largely unknown. In a software development project where "on time and on budget" are key performance indicators it is not clear that the organization can bear such degree of uncertainty. Focus group members in our study mentioned problems that arise when the submissions at the end of a specific crowdsourcing competition do not deliver what was expected, which ultimately delay the project as a whole.

Looking at how organizations can address this problem, our focus group participants mentioned establishing relationships with strong crowd players and reusing players between competitions. While this helps alleviate the uncertainty problem it also potentially reduces the crowd to subcontractors and possibly eradicates some of the benefits expected from the crowdsourcing model.

There are definitely many unanswered questions as to how organizations should deal with the uncertainty inherent in crowdsourced work and future research should explore this topic in more depth.

6 Discussion: Lessons Learned

This paper explored the crowdsourcing phenomenon as a new sourcing model for software projects and the capabilities required from service providers engaging in crowdsourcing. Unlike prior studies on vendor capabilities the focus of this paper was on the primary service provider (or the vendor) but in a unique environment which includes not only the client but also the crowd. There are several interesting lessons learned from the crowdsourcing case explored in this paper. First, the fact that the crowd is not working directly with the end customer, but through the mediation of the primary service provider, resulted in a nested model in which the primary service provider requires client capabilities for dealing with the crowd together with vendor capabilities for dealing with the end client. Further, there is some degree of uncertainty regarding what tasks should be included in the crowd competitions and what the outcome of the competition will be. Therefore, in comparison to past studies that investigated the crowdsourcing phenomenon and reported benefits of crowdsourcing such as improved problem-solving (Doan et al. 2011) and cost reduction (Wexler 2011), in the case of crowdsourcing when a primary service provider is subcontracting to a crowd, the benefits were realized

only under specific conditions, such as well-specified stand-alone non-critical tasks that do not require domain (business) knowledge, and can be easily integrated with the rest of the application/system.

Furthermore, the service provider discovered that setting up and managing crowdsourcing competitions required significant effort in terms of the amount of internal resources and their time. Poorly planned competitions (e.g., if not enough preparatory work was done internally to select and/or specify the task advertised as an event for crowdsourcing competition) did not get enough quality bids, which meant wasted time for the organization.

Last but not least, because crowdsourcing is limiting potential buyers and the participating crowd to online interactions, the processes enabling and supporting the crowdsourcing life cycle need to suit the tasks (open calls) advertised to the crowd, which further limits the type of tasks that can be crowdsourced. This means that tasks that require some degree of flexibility or involve fuzzy requirements are not suitable for crowdsourcing. One of the problems that the service provider in our study faced was related to lack of fit between internal methodologies and processes, and agile software development practices with processes supported by the online crowdsourcing platform. In particular, the lack of flexibility of the crowdsourcing processes embedded in the platform reduced opportunities for the primary service provider to benefit from crowdsourcing. Some of the problems reported referred to the strict duration of specific steps (e.g., the length of time when an "event" is open to receive responses from the crowd) which prevented the service provider team from extending the deadline to receive additional bids in situations when not enough bids were submitted; or deadlines falling on weekends or holidays when the service provider team was not available to evaluate bids. Among other problems reported, the quality of the online platform was mentioned, as sometimes it was not available (because of some technical issues), which meant a complete "blackout" between the service provider team and the subcontractors who could not get in touch outside the platform.

Many of the problems identified in this crowdsourcing initiative are very similar to the problems reported in the early days of outsourcing, when clients were looking for quick ways to reduce costs, but then discovering that, to receive quality service from their service provider, they needed to make a significant investment into setting up correctly their outsourcing engagement (Cullen et al. 2005), which included conducting detailed analysis of processes and systems suitable for outsourcing (Aron and Singh 2005), evaluating sourcing models (Oshri et al. 2011), selecting service providers (Feeny et al. 2005) and being willing to invest the resources to manage the outsourcing engagement.

Interestingly, today, when many client organizations have learned the basic lessons of how to outsource successfully, and service providers have moved up the value chain and developed extensive experience in delivering high-value knowledge-intensive services (Carmel 2006), we observe similar patterns when new sourcing models emerge. In this study we observed a primary service provider assuming classical "client" behavior when engaging in crowdsourcing. Therefore, as shown in this study, adopting some of the "client capabilities" and extending

those critical "vendor capabilities" would help service providers to be more successful in engaging in crowdsourcing models. Furthermore, the added complexity due to the higher extent of uncertainty that characterizes the crowd makes it more difficult for the service provider to manage both relationships (with the end client and with the crowd) and merits further investigation in future studies.

7 Conclusion and Contributions

Our paper makes several important contributions to IT outsourcing literature which, so far, has been very limited on reflecting the vendor's perspective on outsourcing. Our major contribution lies in studying capabilities of a primary service provider that uses crowdsourcing for subcontracting work. Using crowdsourcing has become a popular trend in outsourcing practice. Therefore, assuming that service providers are using only in-house resources for delivering outsourced work (as reflected in the existing literature on vendor capabilities) is far from today's reality. An important contribution this paper makes is to the IS outsourcing literature where we (i) explore the phenomena of crowdsourcing that is increasingly becoming a popular sourcing model from the eyes of the service providing organization, and (ii) revise existing theoretical frameworks on vendor and client capabilities to develop a framework of new vendor capabilities for crowdsourcing. We build on the literature on client and vendor capabilities to develop an integrated understanding of capabilities required for a primary service provider to successfully utilize crowdsourcing. Furthermore, within the IS outsourcing literature, to our knowledge, our research is the first to consider the perspective of a primary vendor who needs not only to deliver services to a client, but also to manage subcontractors. Existing literature on mediated sourcing models have focused on the subcontractor perspective only (e.g., Jarvenpaa and Mao 2008) and did not incorporate the crowd as a unique and new entity.

This paper also has practical relevance, in particular for organizations that are experimenting with, or considering, crowdsourcing. Findings from the focus groups reported in this paper can be used as a guide for setting up and managing crowdsourcing initiatives.

References

Aron, R., & Singh, J. V. (2005). Getting Offshoring Right. *Harvard Business Review, 83*(12), 135–143.

Brabham, D. C. (2010). Moving the crowd at threadless. *Information, Communication and Society, 13*(8), 1122–1145.

Cao, L., Mohan, K., Xu, P., & Ramesh, B. (2009). A framework for adapting agile development methodologies. *European Journal of Information Systems, 18*, 332–343.

Carmel, E. (2006). Building your information systems from the other side of the world: How infosys manages time zone differences. *MIS Quarterly Executive, 5*(1), 43–53.
Cook, S. (2008). The contribution revolution. *Harvard Business Review, 86*(10), 60–69.
Cullen, S., Seddon, P., & Willcocks, L. (2005). Managing outsourcing: The lifecycle imperative. *MIS Quarterly Executive, 4*(1), 229–246.
Doan, A., Ramakrishnan, R., & Halevi, A. Y. (2011). Crowdsourcing systems on the World-Wide Web. *Communications of the ACM, 54*(4), 86–96.
Duan, C., Grover, V., & Balakrishnan, N. (2009). Business process outsourcing: An event study on the nature of processes and firm valuation. *European Journal of Information Systems, 18*, 442–457.
Ethiraj, S. K., Kale, P., Krishnan, M. S., & Singh, J. V. (2005). Where do capabilities come from and how do they matter? A study in the software services industry. *Strategic Management Journal, 26*(1), 25–45.
Feeny, D., & Willcocks, L. (1998). Core IS capabilities for exploiting IT. *Sloan Management Review, 39*(3), 9–21.
Feeny, D., Lacity, M., & Willcocks, L. P. (2005). Taking the measure of outsourcing providers. *MIT Sloan Management Review, 46*(3), 41–48.
Gefen, D., & Carmel, E. (2008). Is the world really flat? A look at offshoring at an online programming marketplace. *Mis Quarterly, 32*(2), 367–384.
Geisler, G., Willard, G., & Ovalle, C. (2011). A crowdsourcing framework for the production and use of film and television data. *New Review of Hypermedia and Multimedia, 17*(1), 73–97.
Goles, T. (2006). Capabilities for information systems outsourcing success: insights from the resource-based view of the firm. In R. Hirschheim, A. Heinzl, & J. Dibbern (Eds.), *Information systems outsourcing: enduring themes, emergent patterns, and future directions* (pp. 347–378). Berlin: Springer.
Greengard, S. (2011). Following the crowd. *Communications of the ACM, 54*(2), 20–22.
Haythornthwaite, C. (2009). *Crowds and communities: light and heavyweight models of peer production*: *Proceedings of the Hawaii International Conference on System Sciences,* January 5–8, Big Island, Hawaii.
Horton, J. J. & Chilton, L. B. (2010). *The labor economics of paid crowdsourcing*: *Proceedings of the 11th ACM Conference on Electronic Commerce, EC '10*, New York, NY, USA.
Howe, J. (2008). *How the power of the crowd is driving the future of business*. London.
Jarvenpaa, S. L., & Lang, K. R. (2005). Managing the paradoxes of mobile technology. *Information Systems Management, 22*(4), 7–23.
Jarvenpaa, S. L., & Mao, J. Y. (2008). Operational capabilities development in mediated offshore software services models. *Journal of Information Technology, 23*(1), 3–17.
Joshi, K. D., & Kuhn, K. M. (2007). What it takes to succeed in information technology consulting: Exploring the gender typing of critical attributes. *Information Technology and People, 20*(4), 400–424.
Jouret, G. (2009). Inside Cisco's search for the next big idea. *Harvard Business Review, 87*(9), 43–45.
Kishore, R., Rao, H. R., Nam, K., Rajagopalan, S., & Chaudhury, A. (2003). A relationship perspective on IT outsourcing. *Communications of the ACM, 46*(12), 86–92.
Klaus, T., & Blanton, J. E. (2010). User resistance determinants and the psychological contract in enterprise system implementation. *European Journal of Information Systems, 19*, 625–636.
Lacity, M. C., Solomon, S., Yan, A., & Willcocks, L. P. (2011). Business process outsourcing studies: a critical review and research directions. *Journal of Information Technology, 26*(4), 221–258.
Lee, J. (2001). The impact of knowledge sharing, organizational capability and partnership quality on IS outsourcing success. *Information and Management, 38*, 323–335.
Levina, N., & Ross, J. W. (2003). From the vendor's perspective: exploring the value proposition in IT outsourcing. *MIS Quarterly, 27*(3), 331–364.
Lewin, A. Y., & Peeters, C. (2006). Offshoring work: Business hype or the onset of fundamental transformation? *Long Range Planning, 39*(3), 221–239.

Mårtensson, P., & Lee, A. S. (2004). Dialogical action research at omega corporation. *MIS Quarterly, 28*(3), 507–536.

Mahnke, V., Wareham, J., & Bjorn-Andersen, N. (2008). Offshore middleman: Transnational intermediation in technology sourcing. *Journal of Information Technology, 23*, 18–30.

Nicholson, B., & Sahay, S. (2001). Some political and cultural issues in the globalization of software development: Case experience from Britain and India. *Information and Organization, 11*, 25–43.

Oshri, I., Kotlarsky, J., & Willcocks, L. P. (2007). Managing dispersed expertise in IT offshore outsourcing: lessons from Tata Consultancy Services. *MIS Quarterly Executive, 6*(2), 53–65.

Oshri, I., Kotlarsky, J., & Willcocks, L. P. (2011). *The handbook of global outsourcing and offshoring* (2nd ed.). London: Macmillan.

Otondo, R. F., Pearson, A. W., Pearson, R. A., Shaw, J. C., & Shim, J. P. (2009). Managerial problem-solving in the adoption of radio frequency identification technologies. *European Journal of Information Systems, 18*, 553–569.

Parasuraman, A., Berry, L. L., & Zeithaml, V. A. (1991). Understanding customer expectations of service. *MIT Sloan Management Review, 32*(3), 39–48.

Poetz, M. K., & Schreier, M. (2012). The value of crowdsourcing: Can users really compete with professionals in generating new product ideas. *Journal of Product Innovation Management, 29*(2), 245–256.

Proulx, S., Heaton, L., Choon, M. J. K., & Millette, M. (2011). Paradoxical empowerment of producers in the context of informational capitalism. *New Review of Hypermedia and Multimedia, 17*(1), 9–29.

Rajkumar, T. M., & Mani, R. V. S. (2001). Offshore software development, the view from Indian suppliers. *Information Systems Management, 18*(2), 63–73.

Rottman, J., & Lacity, M. (2006). Proven practices for effectively offshoring IT work. *Sloan Management Review, 47*(3), 56–63.

Sanders, N., Locke, A., Moore, C., & Autry, C. (2007). A multidimentional framework for understanding outsourcing arrangements. *Journal of Supply Chain Management, 43*(4), 3–15.

Saxena, K., & Bharadwaj, S. (2009). Managing business processes though outsourcing: A strategic partnership perspective. *Business Process Management Journal, 15*(5), 687–715.

Wexler, M. N. (2011). Reconfiguring the sociology of the crowd: exploring crowdsourcing. *International Journal of Sociology and Social policy, 31*(1/2), 6–20.

Whitla, P. (2009). Crowdsourcing and its application in marketing activities. *Contemporary Management Research, 5*(1), 15–28.

Willcocks, L. P., & Feeny, D. (2006). IT outsourcing and core IS capabilities: challenges and lessons at dupont. *Information Systems Management, 23*(1), 49–56.

Willcocks, L.P. & Graig, A.S. (2008). *The outsourcing enterprise: Building core retained capabilities*. Logica: whitepaper.

Willcocks, L.P., & Lacity, M. (2009). *The practice of outsourcing: from ITO to BPO and offshoring*. London: Palgrave.

Yang, J., Adamic, L. A., & Ackerman, M. S. (2008). *Crowdsourcing and knowledge sharing: strategic user behavior on taskcn: Proceedings of the 9th ACM Conference on Electronic Commerce, EC '08,* New York, NY, USA.

A Business Ecosystem Perspective on Open Platforms and Outsourcing Relationships: A Software Industry Case Study

Michael D. Frutiger, Sandra A. Slaughter and Sridhar Narasimhan

Abstract In this paper we introduce the business ecosystem concept as a lens to explore how the introduction of an open platform may affect outsourcing relationships in a software industry. The case of a recent military initiative to introduce the F.A.C.E.™ (Future Airborne Capability Environment) open platform as a mechanism to control avionics software costs by increasing the re-use of software is used to illustrate changes to the software outsourcing ecosystem. As a consequence this work then lays the foundation for a detailed investigation of the predicted implications both in general and for the specific context studied, as well as illustrating the value of an ecosystem perspective for evaluating the impact of an open platform on outsourcing relationships in other industries.

Keywords IT outsourcing · Business ecosystem · Open platforms · Open standards · Software industry

M.D. Frutiger (✉)
Ernest Scheller Jr. College of Business, Georgia Institute of Technology, Atlanta, GA 30308, USA
e-mail: Mike.Frutiger@scheller.gatech.edu

S.A. Slaughter
Information Technology Management, Ernest Scheller Jr. College of Business, Georgia Institute of Technology, Atlanta, GA 30308, USA
e-mail: Sandra.Slaughter@scheller.gatech.edu

S. Narasimhan
Ernest Scheller Jr. College of Business, Georgia Institute of Technology, Atlanta, GA 30308, USA
e-mail: Sri.Narasimhan@scheller.gatech.edu

R. Hirschheim et al. (eds.), *Information Systems Outsourcing*, Progress in IS,
DOI 10.1007/978-3-662-43820-6_20

1 Introduction

The costs of developing software in many industries have continued to rise while industry stakeholders face increased budget and schedule pressure. The military avionics software industry is one example. The firms in this industry develop software, such as navigational systems, that operate aircraft. The current software outsourcing process in the avionics industry typically involves custom development by a proprietary vendor. This process is characterized by long lead times and is specific to aircraft platforms due to proprietary architecture and infrastructure. Given the lack of common systems and standards, there is typically little re-use of software products across these platforms, and it can be expensive as well as difficult to develop new capabilities. Open standards and platforms are initiatives that can increase interoperability and reuse of software products and have the potential to transform outsourcing relationships in an industry. However, it is not clear how such standards and platforms will impact industry dynamics.

In this paper we will show how a business ecosystem perspective can be used build a broad conceptualization of a software industry that will allow us to assess the impact of major changes to the industry relative to the outsourcing relationships of the member organizations that compose it. Specifically, we will use a recent open standards initiative to consider the implications of introducing an open platform for software outsourcing relationships in an industry. In doing so we will build the foundation for the future use of the ecosystem model to reveal and potentially reconcile phenomena within an industry, and provide the groundwork for the future research of outsourcing relationships and specific open platform implications.

This paper is organized as follows. In Sect. 2 we review the relevant literature. In Sect. 3 we introduce the context we will use to demonstrate the use of the business ecosystem perspective for understanding the impact of industry changes to outsourcing relationships. In Sect. 4 we will introduce the ecosystem model and show how it may be used to illustrate the current industry environment, in particular by highlighting the outsourcing relationships between industry players. In Sect. 5 we will then show how the introduction of an open platform may be broadly reflected in the ecosystem model and the implications for outsourcing relationships revealed. In Sect. 6 we will conclude with a summary of what has been shown. Finally, in Sect. 7, we will discuss opportunities for future work.

2 Literature

While the last two decades have generated a substantial body of research work on outsourcing, most studies have focused on issues relevant to particular client-vendor dyads, such as contracting issues (Dibbern et al. 2004; Grossman and Helpman 2002). Relatively few studies have examined the patterns of outsourcing

relationships in entire industries; notable exceptions include a study of outsourcing in the banking industry (Ang and Straub 1998), and the economic modeling of the integration versus outsourcing decision in a generic industry (Grossman and Helpman 2002). Still, to our knowledge there have been few studies that have examined the nature and structure of outsourcing relationships between different parties in an industry. In contrast, there has been increasing recognition of the role of outsourcing as an essential element of business strategy (Lacity et al. 2009; Dibbern et al. 2004), and consequently the value of evoking multiple perspectives for the broader perspective needed. The need for a broader lens becomes apparent when we consider the impact of changes, such as the introduction of an open platform, that affect multiple clients and providers of outsourced services in a simultaneous and interdependent manner.

A platform may be defined as the infrastructure and rules that support a two-sided network (Eisenmann et al. 2006). Typical examples of closed platforms include Microsoft's Windows, Apple's iPhone, and Facebook. In the case of each of these examples, a common platform supports interaction between two key groups: developers (service producers) and end users (their customers). In closed platforms, the platform owner releases details of the underlying architecture in a deliberately constrained fashion to maintain control of how the platform is used. In contrast to this approach, an open platform is a software system featuring open standards, such as a fully documented application program interface (API). A classic example of this difference in approach is reflected in considering the closed Windows operating system versus the open Linux operating system. While the design details of the Linux operating system are shared openly, access to that information for the Windows operating system is restricted.

The use of open standards has received attention as a potential source of savings and economy in general, with specific attention paid to the information technology and software industries and the firms within it, and, to some extent, government in general (Simon 2005; West et al. 2007; Simcoe 2006). However, although recent literature indicates that granting greater access to a platform may significantly accelerate the development of complementary innovations (Boudreau 2010), there is a lack of insight as to the specific implications of the introduction of open standards-based platforms on member organizations of a software industry. While there is precedent for using models of platform member interactions to evaluate the performance of members of a specific software platform, such as may be defined by a platform owner (such as SAP), its vendors, and customers (Ceccagnoli et al. 2011), this approach is too constrained for our purposes. While the platform model perspective does allow for the consideration of multiple organizations, these models are typically constrained to a simple subset of interactions to maintain mathematical tractability. In order to appreciate the complexity of influences on the outsourcing behavior in a software industry, we need to consider more complex linkages between member organizations.

A business ecosystem is defined as "an economic community supported by a foundation of interacting organizations and individuals—the organisms of the business world" (Moore 1993). Based upon the longstanding work on natural

ecosystems in anthropology and biology (Fitz et al. 1996; Grumbine 1994), a business ecosystem represents an analogical framework for considering a broad set of the loose network of agents who play a role in the business outcomes (Iansiti and Levien 2004). These agents may include, but are not limited to, suppliers, distributors, outsourcing firms, makers of related products or services, trade associations, standards bodies, government institutions, and other interested parties (Iansiti and Levien 2004; Moore 1998). The ability to consider a large set of interdependent agents makes this approach particularly well suited to studying industry-wide changes.

3 Context: The Military Avionics Software Industry

The context in our study is the military avionics software industry. The military is tasked with maintaining an assigned level of air capability. To do so, they maintain a large and diverse fleet of aircraft through three types of projects of decreasing complexity: new construction, upgrades, and maintenance (repair). Software is a core element of most project work, and is argued to account for the majority of an aircraft's cost over its lifecycle. Most projects are outsourced by government program offices to one of a small number of organizations that have sufficient resources and scale to manage the project. These primary contract holders, or "primes", then typically outsource various aspects of the project to other independent firms. It is not uncommon for firms that have received outsourced tasks to further outsource some portion of the work they have received, creating multiple cascading levels of dependency. Horizons are long with contracts lasting years or even decades.

Prime vendors perpetuate a "silo" structure by conducting projects independently of each other, and with minimal regard for future requirements. The result is software that is not only built to the proprietary standards of the firms participating in the contract, but also heavily customized to the specific circumstances of the project (e.g. the specific aircraft, developers, firms, etc.). Given the extended service lifetime of aircraft, with some having expected lifespans of 70 years or more, many upgrade projects should be expected. In the current environment, each successive project introduces additional proprietary customization. While these practices are seen to exacerbate costs significantly, primes are typically rewarded for their proprietary designs by being given successive contracts in order to avoid the cost premium of another firm being tasked with untangling the proprietary work of the last firm.

Though it is difficult to appreciate the full implications of the military's outsourcing process as outlined above, insufficient coordination and a lack of common standards would be expected to inhibit software reuse and increase project costs. Some avionics software vendors (suppliers) may recognize when they are re-creating a system they have already developed for a slightly different aircraft. Others may not realize that they are building a custom system for one program

office (the administrative unit that oversees military aircraft acquisitions) when another program office just bought a comparable system from their competitor. However, most vendors and customers probably recognize that unless the customers coordinate their efforts they will regularly fund duplicative efforts.

In a common scenario of the current system, a prime vendor (e.g. Boeing or Lockheed Martin) is given the contract for a new avionics software suite. The prime designs a highly customized and unique system in an attempt to maximize its capabilities (that is, to build a "state of the art" solution). This high level of customization introduces significant cost in terms of original design/engineering work and high coordination and component costs with suppliers around custom (inherently increasingly proprietary) requirements. This custom work also takes time. In contrast to commodity processes, original work is exceedingly difficult to accelerate as the resources added introduce overhead that eventually cripples the process (Brooks 1995). These high costs complicate funding, requiring additional approvals and coordination within the Government which additionally delays the process. Residual ongoing costs for maintenance, updates, and upgrades echo the burdens of this customization.

In contrast, one can envision a scenario where a prime is given a contract for a new avionics software suite that requires the prime to leverage a platform that is broadly recognized by the military avionics industry and which provides open standards and a repository of available standards-based software. During the requirements building process, the prime is directed toward a prioritized (constrained) set of functionality that defines what is essential for the project's success. As the requirement for original (custom) work is reduced, the cost and time for development are reduced. The use of standards reduces the coordination, development time, and costs of the suppliers as well. The overall cost reduction reduces the burden of funding and potentially the time involved in securing it. Going further, residual ongoing costs (and even future new software development costs) are reduced as the working base of standards-built technology grows and processes optimize with time.

Two themes echo in the above passages—that of an open platform, and that of governance. In response to this need, the military has introduced an aggressive initiative to specify a set of open standards, tools, and processes for avionics systems known as the Future Airborne Capability Environment (FACE™) platform, with the expectation that this platform will empower the efficiencies envisioned above—especially through the establishment of open interface elements of system modules to ensure compatibility and the creation of a software repository to host software for later reuse. However, clearly providing a platform alone is not the full answer. Fundamental changes in how software is outsourced within the avionics industry are required to make this initiative successful. Going forward we will attempt to illuminate some of the underlying implications and choices of the path forward, using the business ecosystem perspective to frame our discussion.

4 The Ecosystem Model

4.1 Introduction

The avionics industry, and within it the military avionics industry, features a large and diverse set of players and relationships. Collectively this makes for a very complex operation—even more so when you consider how industry changes such as ever evolving technology and aggressive periods of mergers and acquisitions can make (and have made) these players and relationships a moving target (Pint et al. 1994). Any significant change has the potential to affect all parties to some extent. In the case of the introduction of an open platform, to be fully successful it must affect all parties. Therefore, it is useful to have a way to consider the players broadly. For this purpose, we propose a business ecosystem model to assist in representing and conceptualizing the players, their roles, and their relationships. Once constructed, this model may provide a foundation for considering the implications of changes or other specific factors as well as generally providing a conceptual framework for the industry itself. Clearly capturing every member of the industry is unrealistic for a general model. Therefore we will focus on a representative set for generalized business scenarios.

The concept of ecosystems derives from observations of bordered segments of nature where multiple components of natural systems interact in complex and sustaining ways. Ecosystems may be viewed as being primarily composed of (and therefore defined by) elements (firms), relationships (value exchanges), and boundaries (a given industry). While boundaries may seem increasingly problematic to define given the increasing variety and complexity of firm interactions, they are necessary to allow for a manageable focus. In other words, while a firm could generate components for the avionics and automotive industries and therefore have a presence in the ecosystems of both industries, it is still constructive to focus on the avionics industry in isolation. In the case of the military avionics software industry, the boundaries are additionally strengthened by the presence of regulations that engender specialized practices (e.g. accounting requirements, indemnity), such that those firms who participate in both military and commercial enterprises typically do so through disparate divisions. As participants in the ecosystem, we will generally refer to firms and customers as players.

Ecosystems typically self-organize to evolve around a player (or players) who define the primary opportunity (Popp and Meyer 2010). In enterprise software, a classic example would be SAP, where small vendors address the gaps in the market that exist around, and could be said to be left by, SAP. In military avionics, the Government creates the dominant opportunity around which firms evolve, with the ecosystem influence of the rest of the industry players being largely commensurate with firm size. When a change or disruption, such as the introduction of an open platform, is introduced to the ecosystem, the system will adapt relative to the individual motives of the players, such as profit, and to a general motive of stability. This stability motive means that change is naturally resisted until a

threshold is reached at which point the change prevails, and players adapt relative to their own profit motives.

In terms of understanding the profit motives of players in the ecosystem, it is useful to consider three basic player types: niche players, dominators, and keystone players (Popp and Meyer 2010). Niche players are generally smaller firms who focus on a narrow profitable area. In avionics, an example could include a firm that builds mapping software, perhaps without offering hardware or performing integrative services. In this case the avionics software vendor focuses on addressing a specific need—mapping. Dominators are generally large firms who attempt to take over as much of the industry as they can, e.g. through buying up or squeezing out other players. An example of this behavior would be a prime who attempts to own the firms to whom they might otherwise outsource. We would expect this type of acquisition activity to be moderated by the perceived stability of demand for the services offered by niche players. Small players offering services that are expected to remain in demand may make attractive acquisition targets. Finally, keystone players attempt to leverage niche players to their advantage through relationships and partnering. Given the keystone player's use of and need for niche players as resources, they will tend to defend them to protect their own interests. The Government clearly intends to play this role. A firm, such as a prime, that plays an integrator role and recognizes the value of its subcontractor options may play this role as well, whether as a lead system integrator who pulls together all of the needed components needed to assemble the completed product or as a firm providing a lower level of integration. In fostering competition and a healthy ecosystem, the Government will want to consider how decisions contribute to the success of keystone and niche players relative to dominant players. In general the capacity of an ecosystem to evolve, adapt, and innovate is bound to the number of niche players.

4.2 Outsourcing Ecosystem Prior to the Open Platform

In Fig. 1 we introduce an ecosystem illustration of outsourcing in the avionics software industry prior to the introduction of the open platform. Note that the ecosystem illustration shows only the fundamental economic transactions (value exchanges) between the various players. Communications or other types of interactions are not shown.

The figure captures a representation of the player types likely to be involved in the two most complex and costly project types in the outsourcing environment prior to the introduction of the open platform: the building of a new aircraft, or the upgrade of an existing one (Consortium 2011 (working paper)). Common off-the-shelf (COTS) and subcomponent suppliers are less likely to play an integrative role, although larger suppliers are. The majority of supplier integration is performed by a lead system integrator (LSI) who is typically not the Government—but can be, to the degree desired. Note that the three zones capture the three

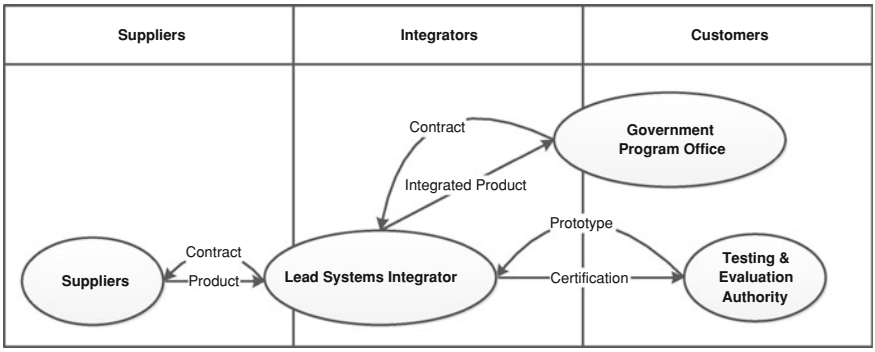


Fig. 1 Outsourcing ecosystem prior to the open platform

primary roles of supplier, system integrator, and customer, and that the position from left to right generally captures the relative completeness of the offering or project. The LSI overlaps into the supplier area as LSIs typically provide some supplier capabilities. Similarly, the program office overlaps into the system integrators' area given the varying degree of this role the program office may choose to take on. Note that while the program office coordinating the project may take on some integration roles, given the resource requirements inherent in this role it is expected that the overall LSI function would remain distinct from the program office whether it is held by the government or, more traditionally, by a firm. The transactions shown between the players are value exchanges, typified by the exchange of a contract (specifications and payment) for the goods specified, with those goods being some combination of hardware, software, and services.

4.3 Open Platform Outsourcing Ecosystem

In Fig. 2 we show how the ecosystem is projected to change with the introduction of the open platform, reflecting the structural elements identified in business discussions with the military. From the figure it is immediately apparent that the overarching theme of the change to the ecosystem from the introduction of the open platform is "more". Three new principal parties are introduced: a Common Components Program Office (CCPO) to coordinate the collective need of the military (in contrast to the current myopic project perspective of the existing capability-focused program offices), a Conformance Authority (for verifying conformance to the open standard), and the Open Standard Authority (for maintaining the standards that define the open platform). With the introduction of these additional ecosystem elements the number of relationships and thereby the scope of coordination increase significantly, in addition to the burden of the new functions added. Alone, this change would signal a significant increase in average project costs due to the coordination overhead arising from greater complexity.

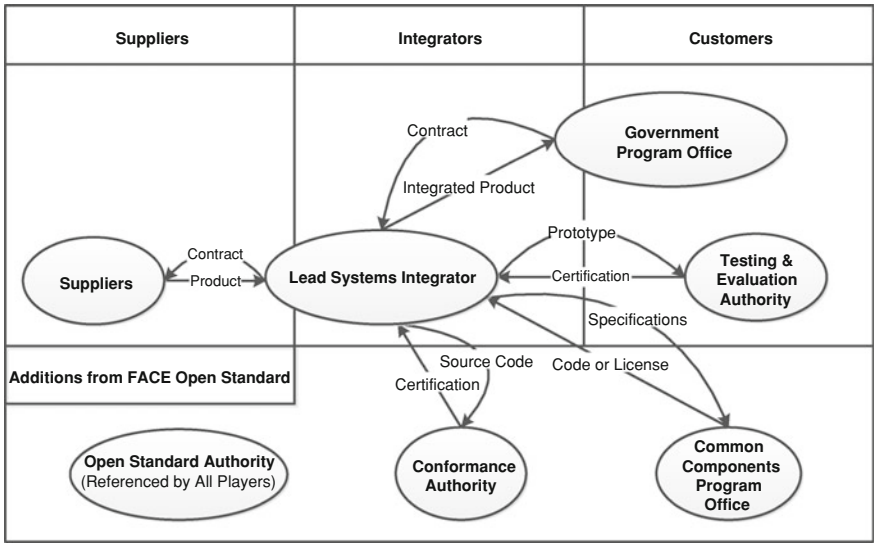


Fig. 2 Open platform outsourcing ecosystem

However, this anticipated cost increase must be contrasted against the potential efficiencies of adopting an open platform, including cost reductions from (1) Increased vendor participation if the platform lowers barriers to entry by reducing development costs and proprietary lock-in by larger firms, (2) Reduced transaction and development complexity, and (3) Efficiencies from better resource management (e.g. forecasting against a broad context of need for efficiency by the CCPO). While the outcome is uncertain, it is likely that the trend inherent in the change will become increasingly apparent with time as operations evolve and settle into their new stable positions. Any significant change is generally accompanied by a period of increased overhead. The open question is whether the new environment, after sufficient time has passed for the process to be streamlined, will achieve a level of performance that is more effective (higher) than it was before the change.

Increased vendor participation presumes that the open platform will reduce the resource requirements for vendors to participate or reduce the ability of established vendors to maintain an advantage. The resulting benefit of this change also assumes that the influence of reduced barriers to competition will have more of a positive effect on the ecosystem by increasing participation than a negative effect by discouraging participation by previously dominant players. Which effect will prevail is likely dependent upon the extent to which firms are in a position to profit in a open platform-based military avionics industry, both in general and relative to other market opportunities. For example, those with military and civilian divisions may shift their resources to the division which features the greatest returns.

5 Implications

5.1 Platform Buy-in

Reduced transaction and development complexity presumes that the open platform will simplify coordination costs as a common framework for coordination will be provided, and simplify software development by reducing the need for custom software development, e.g. through code re-use (both by the supplier and by the program office). The success of this will depend upon the merit of the platform and how well the platform's use corresponds to the industries' competencies. If the open platform is well embraced as a reasonable tool and approach, adoption may be natural and beneficial. If it is seen as an obstacle to work around, the Government will bear the burden of the overhead of vendor efforts to circumnavigate it.

In a software platform ecosystem such as SAP, 3rd party software developers are attracted to the ecosystem by the market opportunity and to the platform specifically (e.g. as SAP-certified members) by the enhanced access to the market and the signal of quality that membership affords (Huang et al. 2009). In the case of the open platform, to the extent that participation and conformance are seen to be associated with increased market opportunity, the acceptance of the standard should be higher. Activities associated with increased buy-in by vendors are therefore essential. Examples include ensuring that vendors see the technical framework as beneficial for its own merit (e.g. through their participation in its evolution), and demonstrating that their customers value its use. It is important to emphasize that for many firms the immediate customer is more likely to be an integrator than the Government. Therefore it is critical that prominent integrators, such as the traditional primes, understand and relay the importance of the platform so that they may effectively champion it.

As with other software platforms, vendor certification (e.g. by the standard's authority) or other visible signs of support can increase the awareness and value of the message (Huang et al. 2009). Certification is also a mechanism by which smaller software firms can be solicited and endorsed (and thereby engaged and motivated) to participate. Note that certification could be enacted in a variety of ways and its requirements could evolve over time. Example criteria for platform certification could include having a percentage of open educated or exam-passing developers on staff, or having successfully generated conformant code. Note that in general the more robust the criteria established, the more potent the signal of quality—but also the greater the potential to be a resource barrier to participation. Trademarking can add clarity and weight to a certification's signal of quality.

5.2 LSI Centrality in the Open Platform Outsourcing Ecosystem

Given the increased complexity inherent in adding additional players to the outsourcing ecosystem, either directly (e.g. Standard Authority) or indirectly (by lowering barriers to participation), it is clear that the role of the LSI becomes even more important in the open outsourcing ecosystem. Some portion must unavoidably be taken by the Government (e.g. CCPO) given their need to exercise a broad perspective to maximally leverage investment; however, most pieces can be bound to the LSI chosen. There is also a large question to answer in terms of "When is an LSI *not* needed?". Or, equivalently, when would a project not need a vendor to aggregate the offerings of multiple downstream vendors? One exception may be acquisitions performed by the CCPO, for example the purchase of software modules for use on forthcoming projects. In the case of simple purchases, such as the addition of licenses for a software offering that has already been tested and verified to be open standard conformant and has been integrated previously in relevant hardware, this would seem to be a straight forward exception. Basic maintenance activities may not require an LSI role for the upgrade program office. However, if the software acquisition is less trivial, the role of an LSI to verify conformance and functional testing of successful integration with representative hardware is likely called for, even if the software isn't intended for immediate implementation. Another important question, assuming the use of an LSI, is clearly that of who should play that role.

The open platform will impact avionics software outsourcing arrangements such as the contracting of an external LSI and that LSI's subcontracting of additional suppliers. When building to the open standard, there is no issue with proprietary interfaces, however, the software integration requirements have arguably increased given the additional parties/processes necessary to accommodate the open standard. Thus, a level of sophistication and experience in coordinating software development efforts, as well as sufficient capital investment and experienced workforce will be required to perform system integration—whether the Government does this or the role is undertaken by a vendor from the private sector.

The key capabilities for an LSI will likely not be very different from the outsourcing environment prior to the introduction of the open platform. The LSI needs systems engineering expertise to handle the engineering process from requirements and divide those out to subcontracts, as well as expertise in contracting, software and hardware engineering, subcontract management, outsourcing management and developing software and hardware. One difference is that in the open platform outsourcing ecosystem, the LSI may be more able to leverage existing software, whether by buying off-the-shelf software if available on the market or leveraging software available through the CCPO, rather than having to subcontract out its development.

Currently, LSIs are typically companies in the private sector, not the Government. However, it may be advantageous for the Government to play the role of LSI, particularly in an open platform environment. If the Government acts as LSI, it has a strong incentive to achieve reductions in costs and other efficiencies and may be able to negotiate more strongly with subcontractors to achieve those objectives. In addition, the Government as LSI can actively work to prevent issues of lock-in and monopoly, which may occur if a non-Government entity acts as LSI. Of course, this assumes that the Government is willing to invest in acquiring the necessary experience and expertise to function effectively as an LSI.

5.3 The Outsourcing Value Chain

In discussing the ecosystem diagram we described how the players were generally situated to capture the relative degree of completeness of their offering. Another way of conceptualizing this is to consider members of the outsourcing ecosystem as members in a value chain. Whereas the concept of a supply chain focuses on efficiently routing materials to a manufacturer (Ganeshan and Harrison 1995), the value chain emphasizes considering member firms in terms of the value they add to the product as it is prepared for a final consumer (Schmitz 2005). In the case of the avionics industry, one supplier's value may be in providing software, another's in providing hardware. Up the chain, integration is needed to ensure that the components function together. Eventually, conformance and final testing is needed. Each contribution adds to the value of the final product. In Figs. 1 and 2 we see that the order of the categories from left to right (i.e. Supplier -> Integrator -> Customer) reflects how elements of the open platform outsourcing ecosystem are able to provide value (or a level of "finishing") to the project. Note that the number of firms tends to increase and the size and individual contribution of firms decrease as we move to the left. As we move to the left firms are expected to become more efficient due to increased focus and competition. This narrowness of focus and small size also makes these firms less stable as they are likely less robust to changes in the market or their immediate environment. In contrast, as we move to the right the firms tend to grow larger and are capable of a higher level of value contribution. They tend to be more stable, but with less efficiency due to increased size and reduced competition. This move from left to right also reflects the transition from ecosystem niche players to increasingly keystone players or dominators. Greater access to niche players potentially affords greater value or cost savings due to the efficiencies they offer, if the additional coordination required to leverage them is sufficiently economical.

6 Conclusion

In this paper we used the case of the military's introduction of an open platform to illustrate how a business ecosystem perspective can be used to consider the impact of an open platform on the outsourcing relationships in a software industry. This allowed us to identify a key set of relevant industry players and classify them based on their ecosystem roles, which in turn guided interpretation of the implications of the change on an organization by organization basis while taking into account that nature and structure of how each organization relates to the others.

Using this approach, we can see that the introduction of an open platform is likely to increase the number of players and, with it, the number and complexity of outsourcing opportunities and relationships in the industry. Growth in the number of players is likely to be inversely related to the size and breadth of services offered by the organization type. Successful adoption of the platform is likely to lead to a greater increase in small suppliers than in larger suppliers or integrators. Customers may outsource services directly for simpler service needs, and the opportunity to do so may increase as more niche players become available and the opportunities for strategically acquiring standards-built software increases. However, we also expect primary contract holders to play an increasingly critical role as service aggregators who represent a larger and more diverse base of supplier services to the customer. This is consistent with work by Gossain and Kandiah that predicts the evolution of an "ecosystem store" that serves as a customer portal to an increasingly diverse set of available services (Kandiah and Gossain 1998). If platform adoption is successful, the increase in niche players may be seen as an overall increase in the fitness of the software industry outsourcing ecosystem (Iansiti and Levien 2004). Keystone players will increasingly be those who fully embrace and leverage the platform, as their standards conformant work will actively create value for other players, helping to evolve their role as industry leaders. Collectively, these changes underscore how the business interactions of the ecosystem players are more meaningfully considered relative to the platform than the more general software industry perspective, as the platform comes to be a stronger predictor of the opportunities for all players. This change in perspective reflects the transformation of the business ecosystem into a platform-based outsourcing ecosystem.

7 Future Work

Having established the value and general approach of using an ecosystem model to predict the impact of technological innovations such as an open platform on outsourcing relationships in an industry, we are now in a position to use this approach to consider outsourcing relationships in the software industry relative to different changes, or to consider how outsourcing relationships in other industries

may be affected by similarly broad changes. Further, the predictions derived from applying the business ecosystem perspective provide a foundation for developing propositions that characterize the nature of the impact of change. The propositions could be operationalized to considering industry data on firm type and outsourcing relationships over time through empirical testing. The relationship oriented predictions also lend themselves to analytical modeling or simulation, suggesting key drivers and outcomes that could be formalized into a two-stage or multi-stage model. Modeling of an outsourcing ecosystem perspective could provide a particularly instructive contrast to the more prevalent platform modeling that tends to focus on small subsets of closed platforms.

Acknowledgment This research, entitled "Cost Impact on Software Ecosystem for the Future Airborne Capability Environment (FACE)" is sponsored by a grant from the U.S. Navy (NAVAIR) and by the Scheller College of Business at the Georgia Institute of Technology.

References

Ang, S., & Straub, D. W. (1998). Production and transaction economies and is outsourcing: A study of the U. S. Banking industry. *MIS Quarterly, 22*(4), 535–552. doi:10.2307/249554.

Boudreau, K. (2010). Open platform strategies and innovation: Granting access vs. devolving control. *Management Science, 56*(10), 1849–1872.

Brooks, F. P., Jr. (1995). *The mythical man-month, anniversary edition: Essays on software engineering*. New York: Pearson Education.

Ceccagnoli, M., Forman, C., Huang, P., & Wu, D. (2011). Co-creation of value in a platform ecosystem—the case of enterprise software. *MIS Quarterly*, *36*, 59.

Consortium, F. A. C. E. (2011). Business model guide. In Business Model Subcommittee (Ed.), (v0.8 m ed., p. 72): OpenGroup. (working paper).

Dibbern, J., Goles, T., Hirschheim, R., & Jayatilaka, B. (2004). Information systems outsourcing: A survey and analysis of the literature. *ACM SIGMIS Database, 35*(4), 6–102.

Eisenmann, T., Parker, G., & Van Alstyne, M. W. (2006). Strategies for two-sided markets. *Harvard Business Review, 84*(10), 92.

Fitz, H., DeBellevue, E., Costanza, R., Boumans, R., Maxwell, T., Wainger, L., et al. (1996). Development of a general ecosystem model for a range of scales and ecosystems. *Ecological Modelling, 88*(1–3), 263–295.

Ganeshan, R., & Harrison, T. P. (1995). *An introduction to supply chain management*. The United States: Penn State University.

Grossman, G. M., & Helpman, E. (2002). Integration versus outsourcing in industry equilibrium. *The Quarterly Journal of Economics, 117*(1), 85–120.

Grumbine, R. E. (1994). What is ecosystem management? *Conservation Biology, 8*(1), 27–38.

Huang, P., Ceccagnoli, M., Forman, C., & Wu, D. (2009). Participation in a platform ecosystem: Appropriability, competition, and access to the installed base. *Working Papers*.

Iansiti, M., & Levien, R. (2004). Strategy as ecology. *Harvard Business Review, 82*(3), 68–81.

Kandiah, G., & Gossain, S. (1998). Reinventing value: The new business ecosystem. *Strategy and Leadership, 26*(5), 28–33.

Lacity, M. C., Khan, S. A., & Willcocks, L. P. (2009). A review of the IT outsourcing literature: Insights for practice. *The Journal of Strategic Information Systems, 18*(3), 130–146.

Moore, J. F. (1993). Predators and prey: A new ecology of competition. *Harvard Business Review, 71*, 75.

Moore, J. F. (1998). The rise of a new corporate form. *Washington Quarterly, 21*(1), 167–181.
Pint, E. M., Schmidt, R., Corporation, R., & Force, U. S. A. (1994). *Financial condition of US military aircraft prime contractors*. Santa Monica: Rand.
Popp, K. M., & Meyer, R. (2010). *Profit from software ecosystems, professional edition*. Herstellug und Verlag: Books on Demand.
Schmitz, H. (2005). *Value chain analysis for policy-makers and practitioners.* Geneva: International Labour Organization.
Simcoe, T. (2006). Open standards and intellectual property rights. In H. Chesbrough, W. Vanhaverbeke & J. West (Eds.), *Open innovation: researching a new paradigm* (pp. 161–183). Oxford: Oxford University Press.
Simon, K. (2005). The value of open standards and open-source software in government environments. *IBM Systems Journal, 44*(2), 227–238.
West, J., Greenstein, S., & Stango, V. (2007). The economic realities of open standards: Black, white and many shades of gray. *Standards and public policy, 87*, 122.