Progress in IS

Rudy Hirschheim
Armin Heinzl
Jens Dibbern *Editors*

Information Systems Outsourcing

The Era of Digital Transformation

Fifth Edition

Springer

Progress in IS

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Preface of the Fifth Edition

More than 30 years after the Kodak Corporation handed over its information technology functions (IT) to IBM, DEC and Business Land, Information Systems Outsourcing has continued to thrive. Although some politicians have exerted pressure on firms to refrain from moving jobs outside of their home nations, recent surveys report outsourcing and offshoring as continuing to grow significantly.

In addition, outsourcing is on the verge of experiencing a significant impact from IT-induced automation. Advances in artificial intelligence and machine learning permit software to take over routines that have been previously conducted by humans. If these software robots (or bots) are provisioned via the cloud, they represent outside resources. Thus, IT and information systems (IS) facilitate the combination of two previously distinct concepts: outsourcing and automation. Bots can be easily provisioned from external service providers via the cloud and seamlessly integrated into internal business processes. This combination of software automation and outsourcing is a key phenomenon in the era of digital transformation. IT becomes ubiquitous, providing the capability to process vast amounts of digitized data through the wide availability of sensory devices, which are connected into the Internet of Things via the cloud. Thus, the era of digital transformation already signals a deep impact on the domain of IS outsourcing.

For this reason, we decided to name the fifth edition of our book *Information Systems Outsourcing: The Era of Digital Transformation*. As a basis for our considerations and discussion, we invited a multitude of renowned international scholars and key practitioners to the 5th International Conference on Outsourcing of Information Services (ICOIS) to Mannheim, Germany, again. The idea is to present the state of the art in IS outsourcing research as well as to discuss its implications for theory, practice, and society. The papers presented at Mannheim provide the foundation of the fifth edition of our book. It succeeds the fourth edition which looked at sustainable business value of IS outsourcing.

At the beautiful new Study and Conference Center of the Mannheim Business School, it became clear that most of the contributions to the conference focused on cloud computing, platforms, and robot process automation. Hence, the era of digital transformation has already offered a clearly visible footprint. After carefully

discussing and editing the submitted papers, we decided to structure the content of this book into eight sections: (1) Emergent Sourcing Challenges, (2) Mastering Innovation Through Outsourcing, (3) Leveraging the Value of Offshoring, (4) Adopting and Innovating Cloud Services, (5) Balancing Risks and Opportunities in Cloud-Based Outsourcing, (6) Benefitting from Service Workforce Platforms, (7) Replacing Humans by Bots, and (8) Final Synthesis. Our book serves as a basis for further interactions and discussions in the rich and dynamic field of IS outsourcing. It should be of interest to academics and graduate students in the field of Information Systems, Innovation Management and Digital Transformation as well as to corporate executives and professionals who seek a better understanding of the underlying concepts and idiosyncrasies of IS outsourcing in the era of digital transformation.

We would like to offer our deepest gratitude to our respected colleagues from around the world who provided the foundations of this fifth edition. Such a book would not be publishable without the enormous efforts of all researchers involved. Thus, we would like to thank all contributing authors for their highly appreciated thoughts and professional cooperation. They have laid the foundation for this book! While we are very grateful to the authors for their contributions to this book, we take responsibility for the content and any errors.

In addition, we would like to convey our deepest gratitude to Nikolaus Kratzat and Matthias Hampel (Strategy&), Dr. Dennis Lips and Toan Nguyen (Anyon/e-shelter), as well as Dirk Schneider (Salesforce) for sharing their industry perspectives and complementing our academic views at the conference. Without their backing, ICOIS 2019 would not have been such a success.

Finally, we owe many thanks to those team members who supported us with respect to the vast organizational activities of the conference and this monograph. In particular, we would very much like to thank Anne Wesch from Mannheim for her relentless support in organizing ICOIS 2019 in Mannheim and Nicolas Mayr von Baldegg from Bern for designing the ICOIS website and providing help to Anne when the circumstance required to do so. Many thanks also to Nicolas, Anna Filippova, and Louis Felder for helping in the coordinative processes in creating this book.

We hope that you as our readers find the fifth edition as vivid and insightful as our last editions.

Baton Rouge, Louisiana — Rudy Hirschheim
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Contents

Introduction: Riding the Waves of Outsourcing Change in the Era of Digital Transformation

Jens Dibbern and Rudy Hirschheim

Abstract The trend towards digital transformation has brought about a number of emerging challenges for information systems outsourcing. Organizations have to understand how to digitally innovate through IS outsourcing, how to govern outsourced digitalization projects, how to cope with complex multi vendor and micro-services arrangements, how to manage data sourcing and data partnerships, including issues of cybersecurity, and how to cope with the increasing demands of internationalization and new sourcing models, such as crowdsourcing, cloud sourcing and robotic process automation. This introductory chapter summarizes these challenges as three entangled or intermingled waves of change. It shows how recent research addresses these waves of change as a basis for organizations to learn how to successfully ride the waves.

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)

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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 origins of IT 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. According to a recent Gartner study the global IT outsourcing market continues to grow having reached $283.5 billion in 2016 (Gartner 2017). IT outsourcing has also 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; Oshri et al. 2019). According to Mears and Bednarz (2005) companies are also outsourcing on a much more selective basis than ever before (See also Overby 2018). 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. 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 IT outsourcing as being interwoven with business strategy has been fueled by the ongoing trend towards digital transformation. A market report by International Data Corporation (IDC 2019) forecasts the worldwide spending on the technologies and services that enable digital transformation of business practices, products, and organizations to reach $2.3 trillion in 2023 with a five-year compound annual growth rate of 17.1%. As organizations become increasingly aware of IT as an enabler of change, the role of IT outsourcing has begun to change as well. The notion of digital transformation is closely linked with new IT-enabled ways of providing IT services in the form of cloud computing and new IT-enabled business models, such as the emergent sharing economy (Apte and Davis 2019; Venters and

Whitley 2012; Weinhardt et al. 2009). Moreover, the potential of IT as a driver of change is not limited to supporting humans and business functions in new ways, but also increasingly includes the potential of replacing humans by automating business processes, i.e. through robotic process automation and the trend of replacing humans by bots (Lacity and Willcocks 2016; van der Aalst et al. 2018), also referred to as the 'second machine age' (Brynjolfsson and McAfee 2016). Cloud computing has considerably transformed the IT services industry in recent years. The provision of IT-as-a-service via the internet has enabled simpler access to IT resources and services and an increasing disaggregation of IT services into smaller components that are provided by an ever-larger pool of new players in the market. In parallel, large platform providers have emerged that seek to orchestrate the myriad of players in their platform ecosystems (Gawer and Cusumano 2002; Ghazawneh and Henfridsson 2013; Huber et al. 2017; Tiwana 2014). This trend towards platforms and ecosystems of IT services has important implications for IT outsourcing. It brings with it new challenges, such as the challenge of orchestrating IT services from a network of providers, to manage the scattered data resources and assets across service providers and to cope with heightened cybersecurity risks due to distributed services and the reliance on cloud infrastructures. Moreover, with the increasing digitalization of business processes, the availability of increasing amounts of data, and advancements in the application of automation techniques and technologies (including advanced machine learning algorithms),[1] the notion of robotics that revolutionized industrial engineering has entered the era of business process engineering in the form of business process automation and various types of bots that take over work previously performed by humans, e.g. chatbots replacing call center agents (Brynjolfsson and Mitchell 2017; Rutschi and Dibbern 2020). The reliance on bots can be viewed as a special type of outsourcing, i.e. outsourcing to machines, which provides new challenges, such as which processes to automate, by whom to automate (i.e. internally or externally), and how to manage human-machine interaction (with internally versus externally provided machines).[2]

Organizations have to walk a tightrope between the many opportunities that the evolving and emerging trends in outsourcing, offshoring, cloud computing, and robotics could provide and the risks and challenges they bring with them. Moreover, multiple partly opposing objectives have to be reconciled which has been framed under the notion of ambidexterity (Gregory et al. 2015). The objectives of increasing efficiencies and achieving cost savings through outsourcing have to be reconciled with the potential of leveraging innovation and transforming the business through outsourcing. Moreover, the adverse reactions from a society increasingly disenchanted by the job displacement and loss that outsourcing causes, have to be considered,

[1] "Machine learning aims to provide increasing levels of automation in the knowledge engineering process, replacing much time-consuming human activity with automatic techniques that improve accuracy or efficiency by discovering and exploiting regularities in training data." (Langley and Simon 1995, p. 55).

[2] According to Wikipedia drawing on the manufacturing context (based on Groover 2014), "Automation is the technology by which a process or procedure is performed with minimal human assistance.".

which also brings about new opportunities for clients and venders to take on societal and economic responsibility in their IT outsourcing endeavors and relationships (Carmel et al. 2014).

2 Three Waves of IT Outsourcing

Whilst outsourcing has evolved considerably since the late 1980s where large IT outsourcing vendors signed multibillion-dollar deals with clients involving the wholesale transferal of corporate IT to these vendors, we see several emerging trends or waves that are associated with the rise of digital transformation.

According to Westerman et al. (2014) digital transformation marks a radical rethinking of how an organization uses technology, people and processes to fundamentally change business performance. While the notion has been around for some time, the role of outsourcing within this transformation has only relatively recently been considered. It appears that the emphasis has shifted from outsourcing legacy and/or traditional services to outsourcing for digital transformation. In fact, according to a recent market study by IDC, worldwide spending on digital transformation will reach $2.3 trillion in 2023, more than half of all ICT spending (IDC 2019). Organizations are looking to vendors, consultants, and researchers who can assist them in this transformation. Academic researchers are now exploring emerging sourcing topics such as crowdsourcing (Blohm et al. 2013; Geiger and Schader 2014), platform ecosystems (Constantinides et al. 2018; Foerderer et al. 2018; Ghazawneh and Henfridsson 2013; Huber et al. 2017; Schmeiss et al. 2019; Tiwana 2002), cloud computing (Schneider and Sunyaev 2016; Yinghui et al. 2018), service innovation (Barrett et al. 2015; Lusch and Nambisan 2015), service automation (robotic process automation—RPA) (Lacity and Willcocks 2016; Rutschi and Dibbern 2020; Willcocks and Lacity 2016), artificial intelligence/machine learning (Davenport and Ronanki 2018), process mining/analytics (Fogarty and Bell 2014), internet-of-things (Dijkman et al. 2015), and blockchain (cf. Lacity and Willcocks 2018).

The rapid growth of digital transformation has led to a changing IT outsourcing landscape that over the past decade has involved into what might be considered three entangled or intermingled ‘waves of change’. They are:

A. The evolving traditional outsourcing of IT services, which refers to the outsourcing of IT functions, i.e. IT tasks, such as software development or data center operations, that are performed by external IT work forces. In such labor-intensive traditional outsourcing of IT services, enduring trends include offshoring and multisourcing, which have been around for some time. But also new sourcing arrangements that are characterized by novel value propositions, such as striving for innovation through outsourcing rather than simply cost savings or getting access to scarce resources. The notion of impact sourcing also relates to a new view on value. It means that clients and vendors consider how their outsourcing arrangements contribute to creating social and society-wide (rather than purely firm) economic value.

B. The emergence of cloud computing and platform ecosystems, which refers to a new way of service development and delivery by the IT industry, i.e. where IT services are developed in large platform ecosystems and provided via platforms with new pricing models (i.e. renting readily available services) and providing services via the internet (i.e. cloud) as Software as a service (SaaS), Infrastructure as a service (IaaS), or Platform as a service (PaaS) (Weinhardt et al. 2009). The move towards platforms also includes the provision of labor as a service and has led to entirely new business models that disrupt traditional industries. This includes crowdsourcing, i.e. engaging the crowd in a new service delivery model, and embracing the use of digital platforms to expose untapped supply and demand of services that are based on the sharing of individually owned resources and assets as exemplified by Airbnb and Uber.

C. The development of robotic process automation and 'outsourcing' to software bots, where entire tasks or business functions are taken over by IT, i.e. a machine, such as a chatbot. Thus, the goal is not to support humans with ever cheaper or better IT services that may stem from external providers, but rather to replace humans by IT.

Although these represent three distinct waves of change, they are in fact intermingled. As visualized in Fig. 1, there are logical interfaces between the waves (i.e. circles). For example, a software bot may be developed by an external service provider using a traditional outsourcing arrangement with an external vendor and the bot may take over work from former in-house personnel of the client and hence the work is outsourced to the bot (Interface between A and C). The bot may then also be provided as a service via cloud computing (Interface between B and C).

The case of Volvo's digital transformation journey (Svahn et al. 2017) is a good example of how digitalization is enabled by all three waves of outsourcing. In order

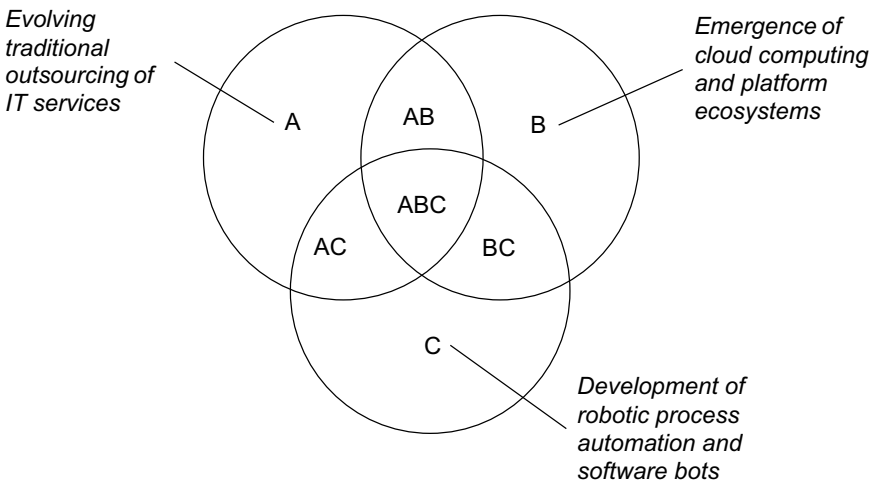

Fig. 1 Crossing waves of change in IT outsourcing

to enter the digital world, Volvo relied on new sourcing models for innovation, i.e. it engaged the crowd to gain new ideas on how the automobile will be transformed into a digital vehicle and what kind of complementary digital services they have to offer to their customers. In implementing these novel digital services, they partly relied on traditional IT outsourcing models by engaging external vendors, but the new digital services were also heavily based on cloud services as the dominant delivery model. In fact, Volvo initially relied on an external cloud infrastructure as a service, but eventually developed its own infrastructure to digitally connect to surrounding digital services, such as bringing Spotify into the car and connecting the car to the environment, i.e. the world of internet of things (Svahn et al. 2017). The latter, i.e. connecting the car to its environment, brought with it an increasing potential of making use of digital data for optimizing processes within the car, leading to add-on services including the additional potential for robotic process automation, e.g. in predictive maintenance.

Thus in the course of digital transformation, organizations increasingly gain the ability of riding all three waves of IT outsourcing.

3 Motivation for the Fifth Edition

This fifth edition of the edited book on *Information Systems Outsourcing* seeks to provide new insights on how organizations can cope with the challenges and opportunities of information systems (IS) outsourcing that arise in *The Era of Digital Transformation*. It offers a 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.

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). However, because it was a paper, it could not do justice to the depth and breadth of the outsourcing landscape and with the dynamic developments in the field, such as IS offshoring. To that end, a second edition was developed in 2006. In that follow-up edition, we reproduced a number of what we considered 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 (www.ICOIS.de) which was held in Heidelberg, Germany, May 29–30, 2007. This edition was reflected by the subtitle: *Enduring Themes, Global Challenges, and Process Opportunities.*

Subsequent to the third edition, 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 formed the basis of the fourth edition of the book. At that event, 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 the fourth edition was: *Towards Sustaining Business Value*.

As the field of Information Systems Outsourcing continued to mature, new technologies emerged and along with them, new forms of outsourcing. The advent of crowdsourcing where work is outsourced to the 'human cloud' (Kaganer et al. 2013) has provided new opportunities for how and where work is done and by whom. This along with the arrival of new technologies and tools such as social media, mobile applications, big data analytics, cloud computing (SMAC) and more recently the internet-of-things and robotic process automation, made it clear that another conference was needed. Thus, we held the 5th International Conference on Outsourcing of Information Services in Mannheim, Germany, June 16–18, 2019 to explore these new developments. As in the past, this event brought together key researchers in the field to offer their thoughts, reflections, and research results on these new topics. The papers presented at the conference form the basis of this 5th edition whose subtitle is termed *The Era of Digital Transformation*.

4 Book Structure and Outline

In seeking to be a resource for researchers and practitioners alike, the fifth edition of *Information Systems Outsourcing* subtitled *The Era of Digital Transformation*, is organized into eighth sections (i.e. Parts). The chapters in each section fall into one or more of the three outsourcing waves identified in the era of digital transformation (see Fig. 1). They either address issues concerning one specific wave of outsourcing or deal with issues at the intersection of waves.

4.1 Part I: Emergent Sourcing Challenges

Following this introductory Chapter (i.e. Chapter "Introduction: Riding the Waves of Outsourcing Change in the Era of Digital Transformation"), the first section examines and provides foundations for understanding *Emergent Sourcing Challenges*.

These emergent sourcing challenges arise at the interface between the evolving traditional wave of IT outsourcing and the two emergent waves of outsourcing, i.e. the wave of cloud computing and platform ecosystems and the wave of robotic process automation or 'outsourcing' to software bots (i.e. ABC in Fig. 1). In fact, the two emergent waves have implications for and can be viewed from the rich foundations of traditional outsourcing research that continues to evolve. Specifically, the important themes of making the sourcing decision, designing contractual structures, and managing the relationship need to be re-evaluated and revisited in light of the increasing digitalization of IT services both in terms of cloud computing and robotics.

Bozan, Lyytinen, and Rose (Chapter "Software Architecture and Outsourcing Governance: Raising Thoroughbreds Versus Cultivating Schools of Goldfish") identify a number of compelling questions that arise in light of the increasing availability of so called micro services based on which client organizations increasingly build their IS landscapes. These micro services are provided by ecosystems of cloud services (including SaaS, PaaS, and IaaS) providers, which are often organized along service stacks and platforms provided by dominant players in the industry that form their own platform ecosystems. Choosing the right portfolio of services and service stacks as well as orchestrating the services and service providers leads to new sourcing challenges that the authors present using the metaphor of a school of goldfish that has to be populated, fed, maintained and put into the right pond with the right environment.

Aubert and Rivard (Chapter "The Outsourcing of IT Governance") examine how IT governance needs to be rethought in light of a changing sourcing landscape characterized by an increasing reliance on outsourcing, offshoring, use of platform services, consumerization of IT and pressure to comply with regulations and standards, such as the Sarbanes–Oxley Act. They argue that these trends have led to an erosion of control over IT governance and suggest a reconceptualization of IT governance in terms of new decision-making structures, processes, and relational capabilities.

Jarvenpaa and Markus (Chapter "Data Sourcing and Data Partnerships: Opportunities for IS Sourcing Research") argue for a change in perspective towards putting a spotlight on data as the key object of sourcing. Access and preparation of data, but also the ability to make use of data has increasingly become a source of competitive advantage. Many new business models are based on the application of machine learning and artificial intelligence algorithms that are only as good as the data with which the algorithms are fed. While organizations produce large amounts of data by themselves, they also increasingly rely on external data, which brings along new challenges for the sourcing of data. The authors discuss the implications of different forms of data partnerships in light of different views of data, i.e. the commodity view, the process view, and the relational view. In doing so they draw a link to traditional perspectives on outsourcing regarding decision-making, contracting, and relationship management.

4.2 Part II: Mastering Innovation Through Outsourcing

In the second section, scholars provide insights into how to achieve innovation through outsourcing, which can be viewed as an evolving theme in traditional IS outsourcing (i.e. Wave A). The focus on innovation as an objective of IT outsourcing has been recognized early on in the outsourcing literature. For example, DiRomualdo and Gurbaxani (1998) have distinguished different strategic intents associated with outsourcing, such as IS improvement ("do IS better"), business impact ("use IT to/achieve better business results"), and commercial exploitation ("exploit IT assets externally). This notion of strategic innovation through outsourcing (Oshri et al. 2015), however has only recently gained momentum in light of today's developments towards digital transformation, which refers to the process of using digital technologies to create new—or enhanced—business processes, customer experiences, and business models (Capgemini 2011). Such digital transformation often occurs with the help of external vendors that develop new innovative IT solutions that can bring along either incremental or radical changes to the client organization. However, the focus on achieving innovation still provides a stark contrast to the more common objectives associated with outsourcing, such as focusing on core competencies and cost savings. In fact, contracting for IT services and achieving innovation have been viewed as a paradox that needs to be addressed sensitively (Aubert et al. 2015). Acknowledging the increasing importance of innovation as an outsourcing objective, the following two studies provide new insights into current innovation practices in the context of IT outsourcing. Specially, they provide insights into the general capabilities required for achieving innovation through outsourcing and the specific approach of making use of multiple vendors in a 'coopetitive' (cooperative and competitive) setting to achieve a desired digital innovation product.

Meiser and Beimborn (Chapter "Innovation in Outsourcing—An Empirical Analysis of Outsourcing Vendors' Innovation Approaches") take stock of current innovation practices in IT outsourcing. Based on data on innovation initiatives of a sample of 180 outsourcing providers they identify key innovation outcomes of these innovation initiatives and their enablers. Notably, the most often mentioned innovations by vendors referred to the development of new, innovative IT products for client organizations, specifically particular software solutions, such as speech and text analysis software or chatbots for employee self-service apps. Innovations are enabled by different factors that can be grouped along four dimensions, i.e. collaboration, processes, structures, and events. Two of them, collaboration with clients and the establishment of innovation labs (as a structural initiative) stood out as especially important for enabling innovation.

Hurni, Dibbern and Huber (Chapter "Emerging Innovation Ecosystems: The Critical Role of Distributed Innovation Agency) focus on the development of IT innovations as a product through outsourcing in a multi-sourcing context. Drawing on the concept of innovation ecosystems, they studied the emergent mechanisms that helped a large logistics provider to master the orchestration of multiple vendors in developing a multi-million dollar mobile solution for its thousands of logistics workers.

Specifically, their findings brought to light the critical role of distributed innovation agency, i.e. the critical role that particular vendors played in coping with emergent coordination challenges that had to be resolved in order to progress in the development of the innovative solution. When particular vendors took agency, this resulted in new procedures and structures that benefited the multi-sourcing arrangement as a whole. Moreover, such behavior mirrors both cooperative (i.e. helping others) and competitive behavior (i.e. improving its own position compared to others) as another constituent element of the emergence of an innovation ecosystem.

4.3 Part III: Leveraging the Value of Offshoring

The third section puts a spotlight on the practice of offshore outsourcing which reflects another continuously evolving theme in traditional outsourcing (i.e. Wave A). Offshoring refers to the outsourcing of IT tasks to an internal or external provider located in another country, also referred to as international or global outsourcing (Apte et al. 1997; Lacity and Willcocks 2001; Rottman and Lacity 2004; Sabherwal 1999; Sahay et al. 2003). While offshoring has been viewed as a major organizational innovation in the 90s and early 2000—mostly due to its significant potential for achieving cost savings—it is now widely recognized as a complementary approach to domestic outsourcing for the provision of IT services, not just in terms of lowering costs but also for achieving quality improvements (Gopal and Koka 2012). In order to achieving the expected benefits associated with offshore outsourcing, however, it is important to recognize both its unique opportunities and challenges (Winkler et al. 2008). In fact, rather than focusing on either the opportunities or the challenges/risks, it is important to find a balance between both (i.e. opportunities and challenges) in order to achieve sustainable value from outsourcing. For example, while offshoring promises lower "production" costs due to lower labor costs, it is also necessary to consider the extra costs associated with outsourcing, in terms of costs for monitoring, coordinating, transferring knowledge, and specifying requirements (Dibbern et al. 2008). Three chapters of this book are dedicated to a better understanding of the idiosyncratic aspects of offshore outsourcing, and how to cope with its inherent tensions in this balancing act.

Krancher and Dibbern (Chapter "Knowledge Transfer in Software Maintenance Outsourcing: The Key Roles of Software Knowledge and Guided Learning Tasks") focus on how to cope with the challenge of knowledge transfer in offshore outsourcing. When offshore vendors take over IT tasks from a client it is often not feasible to acquire previous in-house knowledge through people transfer (as often practiced in domestic outsourcing). Instead, vendor personnel have to gain the (often) client-specific knowledge necessary to perform the required tasks through a process of learning from those that previously performed the task. The authors unpack this knowledge transfer process through a longitudinal study by examining a number of knowledge transfers of a bank that outsourced software maintenance tasks to Indian

vendors. The analysis of respective knowledge transfers from former subject matter experts to vendor software engineers revealed that knowledge transfer occurred through a series of knowledge transfer mechanisms and that the suitability of mechanisms depends on the type of task outsourced and the respective prior expertise of the vendor personnel.

Ning (Chapter "Cultural Intelligence of Offshore IT Suppliers: A Cultural Frame Perspective") examines how an offshore vendor with customers in different cultural regions, can cope with misfits between its own national culture and that of its international clients and how such a process of developing cultural intelligence can even strengthen the vendor's competiveness through transferring best practices of client regions. Based on a case study of a Chinese vendor that experienced significant growth both domestically and internationally, i.e. specifically in the US and Japan, he identifies the process through which the vendor personal gained cultural intelligence over the years by interacting with clients of different cultural backgrounds. Through these interactions, new cultural frames emerged and became embedded into the vendor's work routines. The cultural frames included the development of unique processes, structures, and artifacts that matched the cultural frames of the client regions (i.e. China, Japan, or US). Moreover, transferring cultural capabilities from one client region to another helped increasing the vendor's international competiveness. The findings are summarized in a framework that generalizes the process of achieving cultural intelligence through cultural sense-making.

Fareesa and Nicholson (Chapter "Competing Institutional Logics in Impact Sourcing") also take the perspective of an IT outsourcing vendor, but rather from the perspective of a Western vendor that seeks to extend its operations to offshore regions. In particular, they focus on the rather novel value proposition of impact sourcing, i.e. the practice of building up an offshore service facility not just for business reasons, but also with the objective of contributing to the welfare of marginalized people. Specifically, they seek to examine how vendors can cope with the tensions that arise between competing institutional logics associated with impact sourcing, i.e. the market versus welfare logic. Based on their analysis of a U.S.-based IT outsourcing vendor that has established two offshore centers in Pakistan, they identify the organizational responses taken to address the opposing logics. The responses can be framed as decoupling, combining, and creating compromises between market and welfare logics.

4.4 Part IV: Adopting and Designing Cloud Services

While the previous two sections (Parts II–III) are concerned with evolving themes around the traditional wave of IT outsourcing, the next two sections deal with one of the emergent waves of outsourcing, i.e. cloud computing (Wave B). While some of the unique sourcing challenges associated with cloud computing are already discussed in the first section (i.e. Part I), the two chapters of the next section (Part IV) start

with outlining specific challenges concerned with the adoption and design of cloud services.

Gunupudi and Kishore (Chapter "The Differential Benefits of Cloud Computing for Small and Medium Versus Large Firms") provide an introduction into cloud computing and provide initial insights into differences in the adoption of cloud computing services between large firms and small-and-medium-sized enterprises (SME). Specifically, they distinguish key capabilities of cloud services, such as heterogeneity, scalability, consumption based pricing, and accessibility. They argue that organizations differ in their orientation towards exploration and exploitation to leverage these cloud capabilities for deriving strategic and operational benefits from adopting cloud services. Their findings from a survey among 41 firms show support for their supposition that firm size matters for the aspired capabilities and achieved benefits from adopting cloud services.

Hoffmann, Spohrer, and Heinzl (Chapter "Analyzing Usage Data in Enterprise Cloud Software: An Action Design Research Approach") take the perspective of cloud service providers. They seek to gain a better understanding of how cloud providers can make use of their unique immediate access to usage data (i.e. data on how cloud services are being used by the clients' end users) to support the process of requirements engineering for (re-)designing the providers' cloud services portfolios. Specifically, they contrast the new (usage-)data driven approach for requirements engineering with traditional, feedback-based approaches and suggest that the data-driven approach should be supported by a specific tool (i.e. IT artifact). They frame their study as following an action design research approach and outline the stages to take for its implementation.

4.5 *Part V: Balancing Risks and Opportunities in Cloud-Based Outsourcing*

The fifth section takes the perspective of organizations that already opted for choosing to adopt cloud services and hence face the challenge of exploiting the opportunities while mitigating the risks associated with this novel approach in the provision of external IT services. Addressing this challenge may be viewed as a balancing act that can take different forms depending on the risks and/or opportunities that adopting client firms are confronted with as well as the contextual conditions of the particular firms that often change over time. The following three chapters examine these risks and opportunities associated with cloud computing with special consideration of the outsourcing context, i.e. the fact that cloud computing can also be viewed as a client-vendor relationship, where a client contracts services from an external entity. They can hence also be viewed as being concerned with the crossing of waves, i.e. viewing issues discussed in the traditional wave of outsourcing (i.e. how to manage risks and opportunities of outsourcing) in the context of cloud computing (Waves AB).

Huber, Dibbern and Fischer (Chapter "How and Why Software Outsourcing Projects Drift—An Actor-Network-Theoretic Investigation of Control Processes") examine how organizations can cope with drift in outsourced software development projects, where the software is provided as SaaS by an external vendor. They define drift as a creeping process of targeting emergent goals, which may (or may not) occur at the expense of losing sight of initial goals. Based on a multiple case study of SaaS-based outsourcing projects in an international bank, they found different patterns of responses to emergent goals, representing either balanced drift (reconciling emergent with initial goals) or unbalanced drift (favoring emergent or initial goals). In order to explain the different routes of drift they contrast the traditional view of project control with an actor network perspective. This leads to a novel dynamic perspective on control that emphasizes the role of the non-human actors in shaping the direction of outsourced software projects. In the SaaS context, such non-human actors contribute to shaping the drift process in the form of changes in the outsourcing contract with the SaaS provider and changes in the SaaS, i.e. the software and the tasks. While human agency is an important trigger of control adaptations, the implementation of controls in form of contract changes and changes in the software and task can take on a life of its own with ripple effects for shaping the directions that SaaS projects take.

Benaroch (Chapter "Cybersecurity Risk in IT Outsourcing—Challenges and Emerging Realities") examines how organizations can cope with increasing cybersecurity risks due to the growing reliance on cloud computing. In fact, in today's IT infrastructures, clients often rely on layered cloud supply chains including multiple providers and sub-contractors that host sensitive client data. He argues that such enhanced cybersecurity risks need to be balanced by client-provider trust, which can stem from different sources, such as decision making, transparency, and reliance on market mechanisms that nurture service providers to behave in ways that enhance (i.e. do not destroy) their reputation. Focusing on the latter, they argue that negative effects on firm value due to cyber security failures are more likely when having deficiencies in IT general controls that ensure and signal having proper enterprise IT processes in place (such as measures in accordance with COBIT). These negative consequences, however, are weekend by board IT competencies. The results from 110 cyber failures in public US firms support these arguments showing the importance of investing into process controls and IT board competency for avoiding stock market penalties in case of failures.

Gozman, Machaiah, and Willcocks (Chapter "Cloud Sourcing and Mitigating Concentration Risk in Financial Services") take another view on cybersecurity risks due to the increasing adoption of cloud services by focusing on concentration risks and how to mitigate them. Concentration risks result from the increasing reliance on single dominant players in the cloud services market. Examples of such central hubs are Amazon and Google that provide cloud infrastructures and platforms that are interlinked with various other cloud services. If such central infrastructures brake down, an entire ecosystem of services is effected including its clients. Taking the financial services industry as a point of reference, they gather data from various

sources to identify the drivers of concentration risks, the risk of contagion, and mitigating factors. Based on their analysis they discuss the role of regulators in defining standards for ensuring interoperability between service providers, developing a consistent terminology, and specifying the obligations during incidents, e.g. in terms of guidelines of communication and cooperation among the involved and affected parties.

4.6 Part VI: Benefitting from Workforce and Sharing Platforms

The sixth section deals with the emergence of online platforms for conveying workforces and shared assets as new forms of IT-enabled matching of supply and demand of services (Wave B). These platforms take on different forms with varying purposes. One form refers to crowdsourcing platforms, which enable clients to source tasks to a collection of people (i.e. the crowd), registered on the platform. One of the key benefits of engaging the crowd is to benefit from distributed knowledge (i.e. collective intelligence) (Malone et al. 2010). Crowdsourcing is often used with the purpose of developing new ideas or porotypes of innovations that may then be further developed by the client. Such initatives often take place in the form of organized competitions. However, in general, the process of developing ideas and innovations in a distributed fashion can be designed in various forms, e.g. more or less transparent, which may either foster or prevent the exchange of knowledge sharing among the crowd. Crowdsourcing has become relevant for IT outsourcing as far as the crowd can also be used for developing IT innovations or gaining ideas for digital innovations. As such, typical sourcing questions (coming from traditional outsourcing) arise, such as engaging an internal or external crowd, how to incentivize the participants, and how and to what extent to engage a client in supporting the participants in their task execution. Another form of service workforce platforms has emerged under the umbrella of the sharing economy. Such platforms have emerged as rather radical forms of digital innovations or transformations as they can disrupt entire industries. Prominent examples are Uber and Airbnb. These platforms are relevant for sourcing as far as they enable entirely new forms of engaging and governing individuals as service providers. Specifically, the engagement occurs in a triadic relationship between the consumers of the service, the providers of the service and the platform (that serves as an intermediary between consumers and providers). Since all transactions between consumer and platform as well as between provider and platform take place in digital form, the platform provider obtains a large amount of data that can be used for various purposes in the process of matching supply and demand, prizing services, and guarantying service quality, which are key elements of any sourcing arrangement. Two chapters deal with the different types of emergent online platforms for conveying and sharing services provided by individuals. The two chapters can be viewed

as dealing with the intersection between the traditional wave of outsourcing and the emergent wave of platform-based sourcing (i.e. crossing Waves AB).

Nevo and Kotlarsky (Chapter "Scoping Review of Crowdsourcing Literature: Insights for IS Research") provide an overview of research on crowdsourcing in the IS context. The authors identified and analyzed 484 papers on crowdsourcing. Nine types of papers could be distinguished based on their research focus, among them papers focusing on crowdsourcing applications, on the design of the online platforms and of competition, or on aspects of participation. They conclude with discussing implications for research, specifically how to cope with the various crowdsourcing models and platforms. For this purpose, they discuss different taxonomies of crowdsourcing and their implications for research on sourcing.

Wiener, Cram and Benlian (Chapter "Technology-Mediated Control Legitimacy in the Gig Economy: Conceptualization and Nomological Network") examine the role of technology-mediated control in online platforms for matching supply and demand of a variety of services provided and consumed by individuals. Such individual-based services are often based on the sharing of assets with different degrees of complementary labor services (i.e. 'gig' workers), such as ride sharing (e.g. Uber) and home sharing (e.g. Airbnb), but also home services (e.g., Handy). The providers of such online platforms possess a considerable amount of control over the service provision process based on their access to data about transactions and services, which raises questions of legitimacy from the perspective of those that provide the service (i.e. the 'gig' workers). The authors explore the foundations of such technology-mediated control legitimacy in terms of autonomy, fairness and privacy. They also developed conceptual foundations on the antecedents, consequences and contextual boundary conditions of control legitimacy.

4.7 Part VII: Replacing Humans by Bots

The seventh section deals with the emergent phenomenon of replacing humans by bots (i.e. Wave C), which can take the form of outsourcing to bots (i.e. interface between Waves A and C). A bot represents a "…software application that runs automated tasks over the Internet. Typically, bots perform tasks that are both simple and structurally repetitive, at a much higher rate than would be possible for a human alone." (Wikipedia on "Internet bot"). While such simple and structurally repetitive tasks have been key candidates for business process outsourcing—increasingly in low wage countries, i.e. outsourcing or offshoring to humans supported by IT-systems (Gewald and Dibbern 2009)—many companies have begun to experiment with and implement bots that replace human workforces (Willcocks and Lacity 2016). Such robotic process automation and outsourcing to bots promises additional cost savings but can also lead to enhanced quality, e.g. by becoming immune to human error in task execution. While it is unquestionable that the reliance on bots provides vast potential that will likely grow substantially with the application of artificial intelligence and machine learning algorithms (van der Aalst et al. 2018), they also pose a number

of unique challenges that are yet to be explored. Two chapters contribute to a better understanding of the opportunities and challenges of replacing humans by bots by putting a spotlight on their implementation and use.

Asatiani, Penttinen, Ruissalo, and Salovaara (Chapter "Knowledge Workers' Reactions to a Planned Introduction of Robotic Process Automation—Empirical Evidence from an Accounting Firm") examine the implications of the introduction of robotic process automation for the actual workers that are potentially replaced by bots and/or that have to interact with them. Based on a case of a Finish accounting company that considered introducing RPA into its financial services by drawing on machine learning algorithms, they conducted a series of interviews with affected workers to assess their reactions. The results were rather surprising in that worker reactions were mostly positive, such as seeing the potential for upgrading their jobs, better coping with high workloads, and reducing human errors. The challenges mentioned were related to the integration of robots into the workflow, such as losing control over work through the fragmentation of tasks, i.e. losing sight of the process as a whole. The authors discuss the implications of their findings in terms of cooperation between humans and machines and work atmosphere.

Rutschi and Dibbern (Chapter "Towards an Understanding of Scaling the Software Robot Implementation") focus on the process of implementing bots. Specially, they examine the scaling of bots, which essentially refers to the reuse of already implemented bots or parts thereof in new contexts. Such scaling is motivated by the objective of reducing the costs of implementation in the course of replacing more and more human-executed tasks by machines. The authors identify different scaling modes as well as their triggers, impediments, and enablers (i.e. mitigating factors). Each iteration of reusing components of already existing bots represents a scaling stage, so that over time, the basis for scaling becomes larger thus reinforcing the process of growth in implementing and using bots. The authors illustrate this scaling process with a real-world case of the scaling of a chatbot in a bank that moved from a simple one-language chatbot to one being bilingual, integrated into e-banking, and becoming also a voicebot. They conclude with an outlook for future research on robot scaling.

4.8 Part VIII: Final Synthesis

Our edited book ends with a synthesis reflecting on the presentations and papers submitted to the 5th International Conference on Information Services (ICOIS 2019), which formed the basis of this edited book. In fact, 17 of the 22 presented papers at ICOIS have found their way into this book as updated, or refined versions.

Sabherwal (Chapter "Synthesis: Outsourcing of Information Services: Where Are We?") contributes the final chapter and concluding chapter of this book, by reflecting on the 22 research studies on IS outsourcing presented at ICOIS 2019, in terms of a final synthesis. In doing so, he discusses the state of the art of IS outsourcing research by asking six questions. The first four questions help to grasp the phenomenon of

IS outsourcing and the directions it has taken in recent years, asking: (1) what to outsource, (2) to whom to outsource, (3) how to outsource, and (4) "so what", i.e. what the implications of outsourcing are. The fifth and sixth questions are oriented towards research issues, asking: (5) what literature bases do current IS outsourcing research draw on, and (6) what empirical methods are being used. The chapter ends with broader reflections on how IS outsourcing has transformed in recent years in terms of the actors involved and the governance of outsourcing arrangements. These also have important implications for practice.

5 Conclusion

Overall, in reading the various chapters in this book, we reflected upon what we know and what we don't know about the field. Although this fifth edition of the book did much to document what has been learned about IT outsourcing since our last edition in 2013, numerous interesting questions remain. In this book we have framed the contributions under the topic of IS outsourcing in the era of digital transformation. This is not merely a shift towards a new perspective on strategic outsourcing. Instead, digital transformation is a multifaceted issue that manifests itself in various aspects that have to do with a new value proposition of IT outsourcing, a new way of IT-enabled service delivery (i.e. cloud computing), fundamental changes in the IT service industry (i.e. towards platforms and ecosystems), and a new role of IT as an agent rather than passive object of sourcing (i.e. IT increasingly takes on the role of the agent in the typical principal-agent relationship taking over tasks in the form of bots or software robots that perform tasks autonomously).

As this book clearly shows, outsourcing has evolved dramatically over the last 30+ years—in some planned and unplanned directions. In general, the future of IT outsourcing appears wide open with many unanswered questions. For example, will more and more traditional IT outsourcing services move into (standard) cloud services? Will the increasing disaggregation of services lead to a new form of complexity that requires entirely new approaches of decision-making, orchestration, governance, and control? Will robotic process automation continue to evolve to take over more and more intelligent rather than repetitive and standard tasks? In addition, even if robots take over more and more (intelligent) tasks, who will be building them, providing them as a service, implementing them, and maintaining them? How will organizations and humans keep control over outsourced bots that become more and more autonomous in carrying out tasks and in adapting to the environment? How can privacy, property rights, and security of data be maintained in a world of cloud computing and bots? And, finally, what task will remain for humans?

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!

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