

When Interests Collide:
**Understanding and modeling interests
alignment using fair pricing in the
context of interorganizational
information systems**

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the context of interorganizational information systems**

Waar belangen conflicteren:
Begrijpen en modelleren van het oplijnen van belangen door eerlijke
prijsmechanismen bij interorganisatiele informatiesystemen

Thesis

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The logo of Erasmus University Rotterdam, featuring the word "Erasmus" in a stylized, cursive script.

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Chapter 1

Introduction

Digital communication is at the heart of modern society. During the last two decades, companies such as Facebook and Instagram have revolutionized how people interact with each other. Although less visible to the public, how organizations interact with each other has been rapidly changing as well. Companies such as Salesforce and Descartes have introduced new ways for organizations to interact with their customers and supply chain partners by relying on software-as-a-service business models and cloud-based platforms.

However, the adoption of novel communication technologies at the organizational level faces many more challenges than does adoption by regular individuals. Organizations are much more cautious when it comes to data security and data sharing. Whereas individual users are happy to provide Facebook with their data in return for services, organizations need to carefully evaluate how the service provider will use their data and whether they will be properly reimbursed for sharing such a valuable resource. Furthermore, companies need to evaluate how the adoption of one or another technology will affect their competitive position, the quality of the services provided, their dependence on supply chain partners, and so on. All of these factors make a company's decision to adopt a new communication technology much more difficult.

Interorganizational information systems (IOSs) are information systems shared by two or more organizations. This general term is used in the academic literature to describe diverse systems, such as customer relationship

management systems, airline reservation systems, transportation tracking systems, and many others. One of the most important characteristics of IOSs is that they bring value to their adopter only if other companies have also adopted the system. Adopting a transportation tracking tool is useless when your transportation provider is not using data from or providing data to the tool.

Modern IOSs are forming the backbone of business communities' information infrastructures. For instance, all major seaports use port community systems to coordinate the flow of goods and to make that flow as smooth and efficient as possible. Such systems are used by hundreds of companies of different sizes and playing different roles (e.g., shipping lines, freight forwarders, terminal operators, and customs authorities). Given the diverse interests and demands of different companies, developing an IOS that will be attractive to all prospective users is quite a challenge. However, the successful integration of the diverse interests of prospective IOS users is a necessity for the IOS's long-term survival. Hence, the overarching question addressed by this dissertation is: "How can and why should the diverse interests of different organizations be aligned when developing an interorganizational information system for the benefit of a business community?"

IOSs have been around for more than forty years. Previous researchers have addressed this question from multiple angles, but the ever-changing nature of business practices and technologies means that it remains. One of the instruments to which we pay specific attention in this dissertation has not, to the best of our knowledge, been previously considered — monetary reimbursement for data shared by IOS adopters. The investigation into this instrument is one of the main contributions of this dissertation, not only to IOS research but also to general information systems research because it addresses the more general question of "putting a price tag" on the data.

1.1 A brief history of IOS research

Interorganizational information systems first appeared in the form of on-line database vendors and time-sharing services in the 1960s (Kaufman 1966).

During the next two decades, IOSs grew in complexity and capability to include electronic fund transfer systems, a variety of supplier-buyer order processing systems, and online professional tool support systems (Barrett 1986). One of the best documented cases of IOSs established in the early 1960s is that of airline reservation systems developed in the United States (Copeland and McKenney 1988). Once airlines had established their electronic systems for maintaining seat inventory, they started actively marketing these systems to individual travel agents to establish direct links between consumers and their reservation systems. That dynamic resulted in fierce competition between the major airline carriers American and United for dominance of the airline reservation systems landscape, which lasted around a decade (Copeland and McKenney 1988).

Up to the 2000s, the vast majority of IOSs were based on electronic data interchange (EDI) as the data transfer technology. EDI encompasses a large number of different standards (UN/EDIFACT, ANSI ASC X12, GS1 EDI). These standards specify the exact structure of an electronic message, which ensures that the recipient can properly interpret the message sent by the sender. Various EDI standards were developed by different industries and in different geographical regions. Given the widespread reliance on EDI, IOS research up to the end of the 20th century was practically synonymous with EDI research. Previously published papers focused on the prospective benefits of IOSs and the consequences of their adoption for dyadic buyer-supplier relationships and industries as a whole (Bakos 1991, Premkumar et al. 1994).

Throughout the 1990s, IOSs became increasingly commonplace. All major industries, including automotive, air transportation, sea transportation, healthcare, and finance, developed their own EDI standards and electronic marketplaces. The initial hype regarding the revolutionary nature of the new technology is slowly receding and, even though the majority of practitioners and researchers acknowledge the increased efficiency and decreased costs of such communication, reports on the numerous challenges facing IOS adopters started piling up. Among the many barriers impeding the spread of IOS were the low flexibility of standards, expensive initial development and installation costs, and shifts in bargaining power among companies.

In the early 2000s, the introduction of the XML standard for messages, which is more flexible and not bound by the strict rules of data location, made IOSs more attractive for small and medium companies. The next important technological innovation in the IOS area was the introduction of cloud-based platforms and the accompanying software-as-a-service business model. The initial investment costs required for IOS adoption were significantly decreased and IOS flexibility improved. Companies such as Salesforce and Descartes offer their standardized customer relationship and supply chain management solutions worldwide.

To date, however, technological innovations have not addressed all of the barriers to IOS adoption, which are often social. Companies' IOS requirements differ depending on their size and role in the value chain (Iacovou et al. 1995, Markus et al. 2006). Finding an IOS that fits the requirements of all organizations is impossible. Modern companies operate in a world in which they can use one IOS to support their communication with suppliers, another IOS to support their communication with buyers in the United States, yet another for buyers in the European Union, and so on. Some of the existing IOSs rely on the EDI technologies from the 1990s, whereas others use the latest cloud-based solutions. Although technological progress continues to remove barriers to IOS adoption, some prevail to this day because of the social and collective nature of the phenomenon, which requires the cooperation of many different actors to ensure IOS' success.

1.2 Research motivation and main contributions

Real problems facing practitioners in the Port of Rotterdam inspired this research project. There is a long established tradition of collaboration between the Rotterdam School of Management and Rotterdam Port companies. IOSs were first introduced in the Port of Rotterdam in the late 1980s, and the field has been actively developing ever since. In 2011, under the umbrella of the National Logistics Infrastructure project, Rotterdam Port companies initiated an even closer cooperation with the university on the topic of IOSs. It emerged that certain problems faced by port companies were yet to be

addressed in the academic research, and this dissertation was envisioned to fill this gap.

The first major issue that we investigated was the option of monetary reimbursement to IOS users for data provision to increase its attractiveness for the user community. This instrument has not been previously discussed in the IOS literature. Given the nature of port operations, a small number of large companies concentrate a vast amount of data on the goods that flow through the port grounds. Accordingly, they also contribute a lot of these data to the port community system. When many small freight forwarders and inland transporters use PCS services, they benefit from the data provided by these large companies. The latter often perceive that it is unfair that they provide so much data to the community and do not receive preferential treatment in return. Hence, in collaboration with the PCS provider, we investigated the possibility of establishing a fair sharing scheme for the use of PCS services, which would reward the provision of not only traditional IT services in the form of software and equipment but also of the data provided to the system by various IOS users. We demonstrate that the use of such a scheme could improve the incentives for port companies to adopt this type of system.

The second major issue that has not been discussed in the academic literature was the proliferation of different interorganizational information systems in real life. Port companies had access to a centralized port community system but also used EDI messages to support communication among shipping lines and terminal operators, Web portals for inland transporters to report their arrival and to check the status of containers, customs declaration portals to submit documentation to authorities, and so on. However, most IOS studies focused on a single IOS or a comparison of IOSs rather than the organization and the variety of IOSs that it uses. This focus precluded studies from investigating how the IOS already in use affects a company's decision to adopt a new IOS and the IOS characteristics that need to be considered when adopting a new IOS. We attempt to fill this research gap by introducing the notion of an IOS landscape. We show that the IOS landscape is dynamically shaped by the diverse and often contradictory interests that port companies are pursuing. We conclude that new, innovative IOS management models

are required to align those interests to ensure that the community benefit is maximized.

The overarching question that we attempt to answer with this dissertation is **how can and why should the diverse interests of different organizations be aligned when developing an interorganizational information system for the benefit of a business community**. First, we describe a fair sharing mechanism that could serve as an instrument for aligning those diverse interests (Chapters 2 and 3). Then, we proceed to introduce the notion of the IOS landscape in which firms operate and stress the importance of aligning interests in IOS development for the business community (Chapter 4).

1.3 Dissertation outline

This dissertation consists of three studies that investigate the problem of cooperation and interest alignment in the context of interorganizational information systems. All three studies rely on concepts and methodologies developed within the field of game theory to describe the phenomenon under consideration. The studies differ in the level of analysis and specific methodologies applied.

In Chapter 2, we present a case study of a business community platform in a seaport setting. We focus on pricing challenges faced by this type of interorganizational information system. We find that traditional cost-based pricing methods in the form of transaction and subscription fees cope poorly with the following business community platform characteristics: 1) users of the system also can be contributors (i.e., they provide data for the system); and 2) the services within the platform can have a hierarchical structure in which old services provide input for new services. We propose a new pricing strategy that accounts for these specific challenges. This strategy relies on two building blocks: user value-based pricing and fair sharing. The approach aims to align the incentives for individual users to adopt a business community platform and the community-wide benefit from the platform's introduction. We believe that the use of a new pricing strategy, such as that developed

in Chapter 2, could serve as an additional instrument for the alignment of members' interests in the adoption of the business community platform as the main communication channel.

In Chapter 3, we continue to investigate fair sharing and rewards for data provision in the IOS context. We demonstrate that for a vertical IOS such a fair sharing scheme can create additional incentives for co-opetition among competitors by estimating the value gain for a data provider that comes from the participation of another data provider. The degree of the positive externalities among providers depends on the network structure that, in turn, determines the importance of coordination among competitors for IOS adoption. Furthermore, we investigate the role that network density plays in the success of such a scheme. This chapter is valuable for understanding why IOS landscape development and adoption occur differently in different business communities (e.g., in different global seaports) and how the success of the new pricing strategy can depend on the business community structure.

Chapter 4 introduces the case study of an IOS landscape of the Port of Rotterdam. This paper addresses the research question of how the interests of different companies belonging to the same business community affect the shape of the IOS landscape. Thus, the level of analysis in this paper is the business community and all IOSs being used by companies in that community. In this chapter, we introduce the new concept of the IOS landscape. We define the IOS landscape of a firm as the collection of all interorganizational information systems that a firm can potentially use to connect to its existing and prospective partners (e.g., customers, suppliers, and government organizations). The information exchange among organizations, i.e., which information is available to which partner, and the quality of this information, is shaped by the IOS landscape. We characterize the IOS landscape along four dimensions: the number of IOSs, their architecture, their interoperability, and their substitutability. These dimensions reflect the degree of favorability of the IOS landscape for a firm. In this paper, we adopt a collective action lens to analyze the chances that the IOS landscape is formed in accordance with the common interests of the business community. That community has an IOS landscape consisting of a shared neutral business community platform

accessible to everyone. This chapter facilitates answering our overarching research questions by delineating the variety of interests that firms can pursue when developing IOSs and how those interests interfere with the development of the IOS landscape in a form that would be beneficial for the business community as a whole. Hence, in Chapter 4, we answer the “why” part of our overall research question and demonstrate how companies create barriers to the data flow and data reuse within the business community.

In the last chapter, we discuss our main findings and contributions, acknowledge the limitations of our study, and provide recommendations for future research in the area.

1.4 Declaration of contributions

Rob Zuidwijk and Peter van Baalen served as first and second supervisors on my Ph.D. dissertation and provided guidance, support, and feedback throughout the project. Albert Veenstra and Rob Zuidwijk have been pivotal in setting up collaborations and providing access to many interviewees in the Port of Rotterdam.

This research was financially supported by a research grant from the Erasmus Research Institute of Management, the research project National Logistics Infrastructure sponsored by the government of the Netherlands, and the research project CASSANDRA sponsored by the European Union. When performing the computations for Chapter 2, I used the cloud facilities graciously provided by the SURF organization.

Chapter 2, which I wrote independently, is based on the research I conducted in collaboration with Rob Zuidwijk for the National Logistics Infrastructure project. Rob Zuidwijk provided substantial support in adjusting the Shapley value calculation algorithm to make the computational time reasonable. His ideas were the driving force behind the mathematical transformations discussed in the appendix to that chapter. Port community system representatives provided significant feedback from the practitioner’s point of view. Peter van Baalen and Rob Zuidwijk provided important review comments in multiple iterations.

I conducted most of the work for Chapter 3 independently, with valuable review comments and edits from my supervisory team.

The interviews described in Chapter 4 were conducted either by me or in collaboration with Albert Veenstra. I handled the interview transcriptions and analyses. Frequent discussions with Peter van Baalen helped me shape the theoretical framework guiding the paper. I wrote Chapter 4 independently. Peter van Baalen, Rob Zuidwijk, and Eric van Heck provided valuable review comments and edits.

Chapter 5

General Discussion

This dissertation explores the variety of interests that different companies pursue when developing interorganizational information systems. This dissertation also investigates a pricing strategy that could be used to align those interests for the benefit of the business community.

We demonstrate the recursive nature of the relationship between IOS design and its target user community's interests. On the one hand, with the help of pricing as an element of IOS design, an IOS provider can affect companies' interests in adopting the system. The fair pricing model (Chapters 2 and 3) increases adoption benefits for some community members and decreases them for the others relative to traditional pricing methods. Hence, IOS providers have a clear way to shape community adoption interests with the help of organizational instruments. Such an intervention would not even require changes to the IOS technology itself.

On the other hand, the interests of the IOS community serve as a precursor to IOS design and significantly influence the shape of the IOS being developed (Chapter 4). The IOS target community usually consists of a large variety of players, each pursuing their strategies. The interactions of these players result in multiple IOSs being developed and offered to the community at the same time. The functionality that these systems offer and the architecture and standards on which they are based, all depend on the interests that different actors are pursuing.

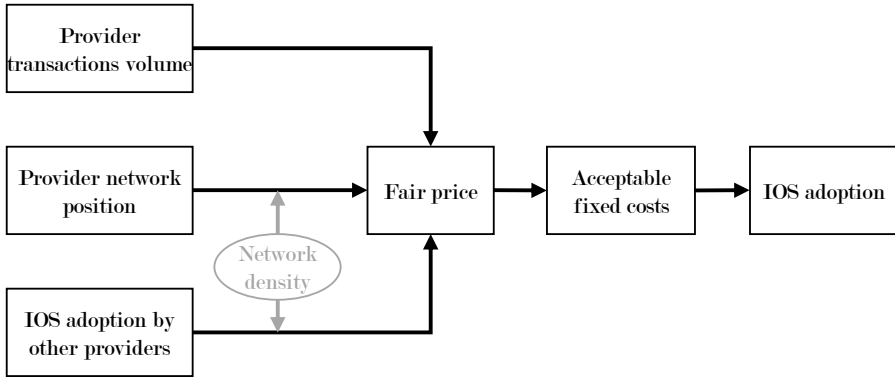
Thus, companies like PCS providers that are working on community in-

formation infrastructure development must understand both the variety of interests that affect the IOS landscape of the community and the instruments that could be used to affect community interests with respect to IOS development in return.

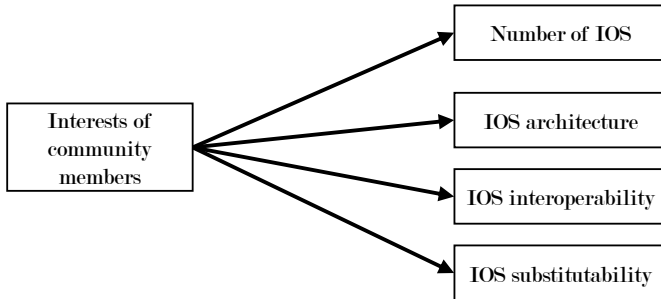
Figure 5.1 summarizes our findings on the interrelationships between IOS design and company interests. The remainder of this chapter expands on these findings and their implications for theory and practice.

Figure 5.1: Summary of research findings (as conceptual models)

IOS design ➡ Company interests



Company interests ➡ IOS design



5.1 Summary of main findings and contributions

Traditional pricing structures based on subscription and transaction fees do not sufficiently address two characteristics of modern business community platforms: users of the system can also be data contributors, and services within the platform can have a hierarchical structure in which old services provide input for new services. In Chapter 2, using the example of a port community system, we demonstrated a potential new pricing strategy that reimbursed data providers based on the value of their contribution to the community. We used the Shapley value concept to estimate the data contribution value because it facilitates the alignment between individual and communal interests. Furthermore, the user value focus of the solution — as opposed to traditional cost-based IOS pricing — enhances the opportunities for IOS development because 1) it only focuses on the services that provide value to the community and 2) the excess revenue generated when the cost of the solution is far lower than the value can be used to finance the development of new features.

We demonstrated that such a pricing mechanism aims to align the interests of individual companies when adopting a service with communal interests. Among other aspects, certain small companies might actually be excluded from the adoption community because their participation would not yield a high enough value for the business community. In our example, this is the case with a number of small barge operators who rarely visit the port and for whom connecting to the port community platform makes no economic sense (at least in the full form whereby corresponding fixed connection costs would be incurred).

In Chapter 3, we showed that such a Shapley value-based pricing scheme can be used in the general case of any vertical IOS, and its main advantage is promoting co-opetition. The competitors participating in such an IOS benefit from other competitors joining the system because higher values created for data consumers are translated into higher reimbursements received by data providers. Such a pricing mechanism can tip the scale in the tug-of-war battle between individual and communal interests, as demonstrated in Chapter 4 in

favor of communal interests because this pricing scheme provides additional incentives for data sharing at the individual level.

Furthermore, we also started investigating the role that network density could play in the adoption of a Shapley value-based pricing scheme. We showed that it can be more effective for business communities with high network densities. Our analysis demonstrated that realizing benefits from IOS adoption can be much easier in low-density networks without much coordination among data providers, which could be a factor that explains why adoption of similar business community platforms proceeds differently in different business networks.

In Chapter 4, we demonstrated that modern companies operate in an environment in which they have access to multiple interorganizational information systems that can differ in the functionality they provide, standards on which they rely, and architecture on which they are based. The existence of such vibrant IOS landscapes is a direct consequence of the divergent interests that companies belonging to the same business community pursue when it comes to IOS development. Even though a business community as a whole would benefit operationally from having a single IOS hub that can be used to handle all cross-company transactions, such a state is close to impossible to achieve because of the interests of individual companies in obtaining a competitive advantage over their peers. Importantly, IOS developers must acknowledge that their IOSs will most likely not be the only one their clients use when developing their product and market strategy — unless they figure out how to address the opposition between individual and communal goals. The main challenges in achieving a single business community IOS hub are not technical but organizational. Hence, we believe that solutions to those challenges should be sought not only on the technical side but on the organizational side as well.

The overarching question of this dissertation is, “How can and why should the diverse interests of different organizations be aligned when developing an interorganizational information system for the benefit of a business community?” In the thesis, we demonstrated that, given the natural course of events, the interests of individual organizations and alliances push the IOS landscape

of the business community in opposite directions. Therefore, the state that is beneficial for the community as a whole is unlikely to be achieved. We proposed a new pricing mechanism for the business community platforms that can serve as an instrument for aligning those interests and partially remedying the problem. We acknowledge that this pricing mechanism cannot eliminate all of the IOS-related business community conflicts but can serve as a step in the right direction.

5.2 Limitations

Our research has a number of limitations, and each chapter lists the limitations of the analysis presented in greater detail. Therefore, we only mention here the overarching topics that are relevant for this dissertation as a whole. First, all of our papers are grounded in the investigation of a single seaport community, which may have introduced a specific bias to our analysis. The analysis of other contexts in which IOS and business community platforms function is required to ensure that our findings are applicable to other settings as well.

In all of our studies, we used a game-theoretical lens to investigate the subject. This perspective is very useful for analyzing the interactions of different agents who have different interests and for predicting the outcome of those interactions. However, other theoretical perspectives could add additional dimensions to the answer to our research question. For instance, the use of institutional theory could demonstrate how the business environment, existing social norms, and business rules play a role in determining companies' objectives and the strategies they use to pursue them.

We focused our attention only on one mechanism targeting the alignment of IOS users' interests: pricing. However, other mechanisms such as IOS governance and technical design can play a role in interest alignment and can influence the effectiveness of pricing. Price is traditionally perceived as an indicator of a good's quality, consumer value, and resources required for that good's production. These traditional roles could conflict with the new role of the interest alignment mechanism that can impede user adoption. We did not

have the opportunity to test the designed pricing scheme in a real-life setting. The application of the pricing mechanism in practice can uncover additional challenges or benefits for community members. Furthermore, we used a number of simplifying assumptions in our analysis, which we discussed in the respective chapters and could prove too unrealistic for practical applications of the pricing scheme. However, we believe that reasonable modifications should be possible to adjust for those aspects if they arise.

5.3 Recommendations for future research

Platform research and a two-sided market perspective on interorganizational information systems have not been discussed at length in our dissertation. However, investigating interorganizational information systems from this angle brings about additional merits. Platforms are architectures that incorporate three core elements: core components with low variability, complementary components with high variability, and interfaces for modularity between core and complementary components (Baldwin et al. 2009). The modular architecture of platforms gives rise to two-sided markets in which an intermediary can charge two sides — buyers and sellers — for their access to and use of the platform. The peculiar characteristic of this type of market is that the intermediary determines not only the price level for its service but also the price structure, for example, one side can partially or completely subsidize the other side. In the case of non-profit platforms, access charges exactly offset each other because one side receives the charge paid by the other side (Rochet and Tirole 2003).

In the IS research, software-based platforms such as Apple's iOS and Google's Android received significant attention (Tiwana et al. 2010, Tilson et al. 2012, Gronli et al. 2014, Eaton et al. 2015, Karhu et al. 2018). A software-based platform is an extensible codebase of a software-based system that provides core functionality shared by the modules that interoperate with it and the interfaces through which they interoperate (Tiwana et al. 2010). However, the software or service level is only one of four layers of modularity identified as forming parts of a digital product. The other three layers are

devices, networks, and contents (Yoo et al. 2010). The content or data layer also can generate a two-sided market among data users, data providers, and an intermediary, as we demonstrated in Chapters 2 and 3.

Digital products as two-sided markets at the content level have received attention in examples of B2C products, such as Facebook, Google, or other online communities (Park et al. 2009, Christofides et al. 2009, Cheung et al. 2011, Kwon et al. 2017). Digital B2C products that have been extensively studied operate based on advertising revenues. In exchange for access to the digital product, consumers reveal information about themselves and their preferences, which is later used for targeted advertising on the same platforms. The incentives for consumers to contribute to such platforms have been extensively studied and include “qualitative” returns as service quality and reputation, in addition to access to basic services (Brousseau and Pénard 2007). The data-sharing mechanism in the B2B context is very different and has received little attention on the platform or in the two-sided market research stream.

We believe that this dissertation also contributes to the literature on platforms or two-sided markets with respect to platforms connecting content providers with content users in a B2B setting. We have investigated a fair sharing approach to specifying the pricing structure for such platform types. Further research into the mechanisms that can be used to promote the provision of data in the context of B2B platforms in vertical value chains could be beneficial. Furthermore, business community platforms that we have been investigating are moving toward transforming themselves into the platforms at the software layer. In the business community platform serving the Port of Antwerp, different IT providers and community members can develop information services that can be installed on the joint community platform, similar to the principles applied in the App store and Google market. Such an approach has the potential to allow companies to participate in the communal initiative and share data with the common database while simultaneously gaining a competitive advantage through the development of company-specific apps. Developing in practice the interplay between two-sided markets at the software and contents layers in interorganizational information systems defi-

nately provides a lot of research opportunities to understand how these markets affect each other and whether they contribute to increased benefits for the business community.

Another interesting future research opportunity that we see is connected to blockchain, the technology underpinning the cryptocurrency Bitcoin that recently received significant attention as a new way of organizing interorganizational communication. First, pilots have been developed to demonstrate blockchain applications to ease paperwork processing in ocean freight, identify counterfeit products, facilitate origin tracking, and operate the Internet of things (Hackius and Petersen 2017). The volume of the research modeling potential for blockchain applications in supply chain is steadily growing (Tian 2016, Casado-Vara et al. 2018, Abeyratne and Monfared 2016, Apte and Petrovsky 2016).

A “blockchain” is a distributed digital ledger that maintains an immutable record of transactions on the web, and is incapable of being falsified after the event (Pilkington 2016, Apte and Petrovsky 2016). The major difference relative to the IOS that we described in our thesis is the decentralized nature of blockchain platforms. Eliminating the need for third-party intermediation or control removes the friction in all types of value exchanges that can arise in the form of costs, risk, information, and control (Bogart and Rice 2015). However, the heterogeneity of benefits that was present in earlier IOSs is present in blockchain applications for supply chains as well and is mainly driven by the different positions that actors occupy along the value chain (Hackius and Petersen 2017, Abeyratne and Monfared 2016). Hence, we believe that a need exists to design participation incentive mechanisms for users of blockchain platforms as well, which will account for this inherent heterogeneity of benefits.

Blockchain implementations support smart contracts — computerized transaction protocols that execute the terms of a contract (Casado-Vara et al. 2018). These protocols allow for a transaction to be automated, yet documented and controlled. Casado-Vara et al. (2018) proposed that smart contracts can also specify an award system for blockchain participants. We believe that an investigation into the incentive mechanisms that can be in-

scribed into blockchain smart contracts and the role of fair sharing in them is a promising research direction that is currently of great relevance for practitioners. Since 2015, IBM and Maersk have been jointly working on a global trade blockchain platform, TradeLens, which has just recently finished the pilot stage. Currently, the platform faces the challenge of convincing the industry to use it as a standard for communication, similar to many previous solutions. Some industry participants already wonder whether this new platform is truly different from other ecosystems that came before it, such as Universal Trade Network, which have yet to get off the ground (Allison 2018).

5.4 Concluding remarks

Information technology is developing at a rapid pace. Every decade or so, innovations arise that promise to revolutionize the manner in which information is exchanged among companies: EDI, XML, e-commerce platforms, blockchain. To date, no single technology has addressed all of the conflicts that arise within the IOS context because of its collective good nature. It might be the case that none ever will. We believe that organizational innovations accompanying the development of information technology have a lot of promise in solving the conflicts arising with IOS development. Further research in this area could contribute not only to theory but also to the IOS practitioners.

Bibliography

- Abeyratne, Saveen, Radmehr Monfared. 2016. Blockchain ready manufacturing supply chain using distributed ledger. *International Journal of Research in Engineering and Technology* **05**.
- Allison, Ian. 2018. 94 companies join IBM and Maersk's blockchain supply chain. *Coindesk* .
- Andersen, Kim Viborg, Helle Zinner Henriksen. 2004. B2B e-commerce diffusion: the efficacy of institutional discourse. Georgios Doukidis, Nikolaos Mylonopoulos, Nancy Pouloudi, eds., *Social and Economic Transformation in the Digital Era*. Hershey, PA: Citeseer, 56–73.
- Apte, Shireesh, Nikolai Petrovsky. 2016. Will blockchain technology revolutionize excipient supply chain management? *Journal of Excipients and Food Chemicals* **7(3)** 910.
- Ba, Sulin, Jan Stallaert, Andrew B. Whinston. 2001. Research commentary: Introducing a third dimension in information systems design—the case for incentive alignment. *Information Systems Research* **12(3)** 225.
- Bagchi, Prabir K, Seung-Kuk Paik. 2001. The role of public-private partnership in port information systems development. *International Journal of Public Sector Management* **14(6)** 482–499.
- Bakos, J Yannis. 1991. Information links and electronic marketplaces: the role of interorganizational information systems in vertical markets. *Journal of Management Information Systems* 31–52.
- Bakos, J Yannis, Erik Brynjolfsson. 1993. From vendors to partners: Information technology and incomplete contracts in buyer-supplier relationships. *Journal of Organizational Computing and Electronic Commerce* **3(3)** 301–328.
- Bala, Hillol, Viswanath Venkatesh. 2007. Assimilation of interorganizational business process standards. *Information Systems Research* **18(3)** 340–362.
- Baldi, Stefan, Hans P Borgman. 2001. Consortium-based B2B e-marketplaces – a case

- study in the automotive industry. Bob O'Keefe, ed., *14th Bled Electronic Commerce Conference: e-Everything: e-Commerce, e-Government, e-Household, e-Democracy*. 25–26.
- Baldwin, Carliss Y, C Jason Woodard, et al. 2009. The architecture of platforms: A unified view. *Platforms, markets and innovation* 19–44.
- Barrett, Stephanie S. 1986. Strategic alternatives and interorganizational system implementations: An overview. *Journal of Management Information Systems* **3**(3) 5–16.
- Bartholdi III, John J, Eda Kemahlioglu-Ziya. 2005. Using shapley value to allocate savings in a supply chain. *Supply Chain Optimization*. Springer, 169–208.
- Barua, Anitesh, Byungtae Lee. 1997. An economic analysis of the introduction of an electronic data interchange system. *Information Systems Research* **8**(4) 398–422.
- Basu, Amit, Steve Myulle. 2008. Electronic intermediaries in smart business networks. *Smart Business Networks. A new business paradigm*. SBNi, 78–89.
- Beck, Roman, Tim Weitzel. 2005. Some economics of vertical standards: integrating SMEs in EDI supply chains. *Electronic Markets* **15**(4) 313–322.
- Bogart, Spencer, Kerry Rice. 2015. The blockchain report: welcome to the internet of value. *Needham Insights* .
- Boonstra, Albert, Jan de Vries. 2008. Managing stakeholders around inter-organizational systems: a diagnostic approach. *The Journal of Strategic Information Systems* **17**(3) 190–201.
- Branzei, Rodica, Dinko Dimitrov, Stef Tijs. 2008. *Models in cooperative game theory*, vol. 556. Springer.
- Brousseau, Eric, Thierry Pénard. 2007. The economics of digital business models: A framework for analyzing the economics of platforms. *Review of Network Economics* **6**(2).
- Casado-Vara, Roberto, Javier Prieto, Fernando De la Prieta, Juan M Corchado. 2018. How blockchain improves the supply chain: case study alimentary supply chain. *Procedia computer science* **134** 393–398.
- Chau, Patrick YK, Kai Lung Hui. 2001. Determinants of small business EDI adoption: an empirical investigation. *Journal of Organizational Computing and Electronic Commerce* **11**(4) 229–252.
- Chau, Patrick YK, Kar Yan Tam. 1997. Factors affecting the adoption of open systems: an exploratory study. *MIS Quarterly* **21**(1) 1–24.

- Chen, Jui-Chih, Bernard C Williams. 1998. The impact of electronic data interchange (EDI) on SMEs: Summary of eight british case studies. *Journal of Small Business Management* **36**(4) 68.
- Cheung, Christy MK, Pui-Yee Chiu, Matthew KO Lee. 2011. Online social networks: Why do students use facebook? *Computers in Human Behavior* **27**(4) 1337–1343.
- Chismar, William G, Johannes Meier. 1992. A model of competing interorganizational systems and its application to airline reservation systems. *Decision Support Systems* **8**(5) 447–458.
- Cho, Bangho, Sung Yul Ryoo, Kyung Kyu Kim. 2017. Interorganizational dependence, information transparency in interorganizational information systems, and supply chain performance. *European Journal of Information Systems* **26**(2) 185–205.
- Choi, Soon-Yong, Dale O Stahl, Andrew B Whinston. 1997. *The economics of electronic commerce*. Macmillan Technical Publishing Indianapolis, IN.
- Choudhury, Vivek. 1997. Strategic choices in the development of interorganizational information systems. *Information Systems Research* **8**(1) 1–24.
- Christofides, Emily, Amy Muise, Serge Desmarais. 2009. Information disclosure and control on Facebook: Are they two sides of the same coin or two different processes? *Cyberpsychology & behavior* **12**(3) 341–345.
- Chwelos, Paul, Izak Benbasat, Albert S Dexter. 2001. Research report: empirical test of an EDI adoption model. *Information Systems Research* **12**(3) 304–321.
- Ciborra, Claudio. 2000. *From Control to Drift: the Dynamics of Corporate Information Infrastructures*. Oxford: Oxford University Press.
- Clemons, Eric K, Paul R Kleindorfer. 1992. An economic analysis of interorganizational information technology. *Decision Support Systems* **8**(5) 431–446.
- Constantinides, Panos, Michael Barrett. 2014. Information infrastructure development and governance as collective action. *Information Systems Research* **26**(1) 40–56.
- Copeland, Duncan G, James L McKenney. 1988. Airline reservations systems: lessons from history. *MIS Quarterly* 353–370.
- Damsgaard, Jan, Kalle Lyytinen. 1998a. Contours of diffusion of electronic data interchange in Finland: overcoming technological barriers and collaborating to make it happen. *The Journal of Strategic Information Systems* **7**(4) 275–297.
- Damsgaard, Jan, Kalle Lyytinen. 1998b. Governmental intervention in the diffusion

- of EDI. Kim Viborg Andersen, ed., *EDI and Data Networking in the Public Sector*. Dordrecht: Kluwer Academic Publishers, 13–41.
- Damsgaard, Jan, Kalle Lyytinen. 2001. The role of intermediating institutions in the diffusion of electronic data interchange (EDI): How industry associations intervened in Denmark, Finland, and Hong Kong. *The Information Society* **17**(3) 195–210.
- Dou, Yifan, Yu Jeffrey Hu, DJ Wu. 2017. Selling or leasing? Pricing information goods with depreciation of consumer valuation. *Information Systems Research* **28**(3) 585–602.
- Douma, Albert, Marco Schutten, Peter Schuur. 2009. Waiting profiles: An efficient protocol for enabling distributed planning of container barge rotations along terminals in the port of Rotterdam. *Transportation Research Part C: Emerging Technologies* **17**(2) 133–148.
- Dunn, Al, W Golden. 2008. New challenges. *Smart Business Networks. A new business paradigm*. SBNi, 36–45.
- Eaton, Ben, Silvia Elaluf-Calderwood, Carsten Sorensen, Youngjin Yoo. 2015. Distributed tuning of boundary resources: the case of Apple’s iOS service system. *MIS Quarterly: Management Information Systems* **39**(1) 217–243.
- Eisenhardt, Kathleen M. 1989. Building theories from case study research. *Academy of Management Review* **14**(4) 532–550.
- Fishburn, Peter C, Andrew M Odlyzko, Ryan C Siders. 2000. Fixed fee versus unit pricing for information goods: competition, equilibria, and price wars. *Internet publishing and beyond: The economics of digital information and intellectual property* 167–189.
- Fulk, Janet, Andrew J Flanagan, Michael E Kalman, Peter R Monge, Timothy Ryan. 1996. Connective and communal public goods in interactive communication systems. *Communication Theory* **6**(1) 60–87.
- Gengatharen, Denise E, Craig Standing. 2005. A framework to assess the factors affecting success or failure of the implementation of government-supported regional e-marketplaces for SMEs. *European Journal of Information Systems* **14**(4) 417–433.
- Gillies, D.B. 1959. Solutions to general non-zero-sum games. Luce R. D. Tucker, A. W., ed., *Contributions to the Theory of Games (Annals of Mathematics Studies 40)*, vol. IV. 47–85.
- Gosain, Sanjay, Arvind Malhotra, Omar A El Sawy. 2004. Coordinating for flexibility

- in e-business supply chains. *Journal of Management Information Systems* **21**(3) 7–45.
- Granot, Daniel, Greys Sošić. 2003. A three-stage model for a decentralized distribution system of retailers. *Operations research* **51**(5) 771–784.
- Gronli, Tor-Morten, Jarle Hansen, Gheorghita Ghinea, Muhammad Younas. 2014. Mobile application platform heterogeneity: Android vs Windows Phone vs iOS vs Firefox OS. *Advanced Information Networking and Applications (AINA), 2014 IEEE 28th International Conference on*. IEEE, 635–641.
- Guo, Zhiling, Dan Ma. 2018. A model of competition between perpetual software and software as a service. *MIS Quarterly* **42**(1) 1.
- Hackius, Niels, Moritz Petersen. 2017. Blockchain in logistics and supply chain: trick or treat? *Proceedings of the Hamburg International Conference of Logistics (HICL)*. epubli, 3–18.
- Han, Kunsoo, Robert J Kauffman, Barrie R Nault. 2004. Information exploitation and interorganizational systems ownership. *Journal of Management Information Systems* **21**(2) 109–135.
- Harmon, Robert, Haluk Demirkan, Bill Hefley, Nora Auseklis. 2009. Pricing strategies for information technology services: A value-based approach. *System Sciences, 2009. HICSS'09. 42nd Hawaii International Conference on*. IEEE, 1–10.
- Hirnle, Christoph, Thomas Hess. 2008. Smart business networks and their IT infrastructure: A framework to evaluate IT investments. *Smart Business Networks. A new business paradigm*. SBNi, 264–278.
- Hong, Ilyoo B. 2002. A new framework for interorganizational systems based on the linkage of participants' roles. *Information and Management* **39**(4) 261–270.
- Howard, Mickey, Richard Vidgen, Philip Powell. 2003. Overcoming stakeholder barriers in the automotive industry: building to order with extra-organizational systems. *Journal of Information Technology* **18**(1) 27–43.
- Hu, Daning, Sherry X Sun, J Leon Zhao, Xinlei Zhao. 2011. Strategic choices of inter-organizational information systems: a network perspective. *Information Systems Frontiers* **13**(5) 681–692.
- Huang, George Q., Jason S. K. Lau, K. L. Mak. 2003. The impacts of sharing production information on supply chain dynamics: A review of the literature. *International Journal of Production Research* **41**(7) 1483–1517.
- Iacovou, Charalambos L, Izak Benbasat, Albert S Dexter. 1995. Electronic data interchange and small organizations: adoption and impact of technology. *MIS Quarterly* **19**(4) 465–485.

- Imai, Akio, Etsuko Nishimura, Stratos Papadimitriou. 2001. The dynamic berth allocation problem for a container port. *Transportation Research Part B: Methodological* **35**(4) 401–417.
- Johnston, H Russell, Michael A Vitale. 1988. Creating competitive advantage with interorganizational information systems. *MIS Quarterly* **12**(2) 153–165.
- Kambil, Ajit, James E Short. 1994. Electronic integration and business network redesign: a roles-linkage perspective. *Journal of Management Information Systems* **10** 59–83.
- Karhu, Kimmo, Robin Gustafsson, Kalle Lyytinen. 2018. Exploiting and defending open digital platforms with boundary resources: Android’s five platform forks. *Information Systems Research* .
- Kauffman, Robert J, Hamid Mohtadi. 2004. Proprietary and open systems adoption in e-procurement: a risk-augmented transaction cost perspective. *Journal of Management Information Systems* **21**(1) 137–166.
- Kaufman, Felix. 1966. Data systems that cross company boundaries. *Harvard Business Review* **44**(1) 141–155.
- Kemahlioglu Ziya, Eda. 2004. Formal methods of value sharing in supply chains. Ph.D. thesis, Georgia Institute of Technology.
- Khanna, Tarun. 1998. The scope of alliances. *Organization Science* **9**(3) 340–355.
- King, John L, Benn R Konsynski. 1995. *Singapore TradeNet: a tale of one city*. Harvard Business School Case no 9-191-009.
- King, Nelson. 2013. Exploring the impact of operating model choice on the governance of inter-organizational workflow: the US e-prescribing network. *European Journal of Information Systems* **22**(5) 548–568.
- Kleinberg, Jon, Christos H Papadimitriou, Prabhakar Raghavan. 2001. On the value of private information. *Proceedings of the 8th conference on Theoretical aspects of rationality and knowledge*. Morgan Kaufmann Publishers Inc., 249–257.
- Koutroumpis, Pantelis, Aija Leiponen, Llewellyn Thomas, et al. 2017. The (unfulfilled) potential of data marketplaces. Tech. rep., The Research Institute of the Finnish Economy.
- Krajewska, Marta Anna, Herbert Kopfer, Gilbert Laporte, Stefan Ropke, Georges Zaccour. 2008. Horizontal cooperation among freight carriers: request allocation and profit sharing. *Journal of the Operational Research Society* **59**(11) 1483–1491.
- Kuan, Kevin KY, Patrick YK Chau. 2001. A perception-based model for EDI adop-

- tion in small businesses using a technology–organization–environment framework. *Information and Management* **38**(8) 507–521.
- Kumar, Kuldeep, Han G Van Dissel. 1996. Sustainable collaboration: managing conflict and cooperation in interorganizational systems. *MIS Quarterly* **20**(3) 279–300.
- Kwon, Hyeokkoo Eric, Wonseok Oh, Taekyung Kim. 2017. Platform structures, homing preferences, and homophilous propensities in online social networks. *Journal of Management Information Systems* **34**(3) 768–802.
- Lahiri, Atanu, Rajiv M Dewan, Marshall Freimer. 2013. Pricing of wireless services: service pricing vs. traffic pricing. *Information Systems Research* **24**(2) 418–435.
- Lee, Ho Geun, Theodore Clark, Kar Yan Tam. 1999. Research report. can edi benefit adopters? *Information Systems Research* **10**(2) 186–195.
- Lee, Sang M, Xin Tan, Silvana Trimi. 2005. Current practices of leading e-government countries. *Communications of the ACM* **48**(10) 99–104.
- Leng, Mingming, Mahmut Parlar. 2005. Game theoretic applications in supply chain management: a review. *INFOR: Information Systems and Operational Research* **43**(3) 187–220.
- Leng, Mingming, Mahmut Parlar. 2009. Allocation of cost savings in a three-level supply chain with demand information sharing: A cooperative-game approach. *Operations Research* **57**(1) 200–213.
- Levy, Margi, Claudia Loebbecke, Philip Powell. 2003. Smes, co-opetition and knowledge sharing: the role of information systems1. *European Journal of Information Systems* **12**(1) 3–17.
- Long, Alan. 2009. Port community systems. *World Customs Journal* **3**(1) 63–67.
- Lyytinen, Kalle, Jan Damsgaard. 2011. Inter-organizational information systems adoption – a configuration analysis approach. *European Journal of Information Systems* **20**(5) 496–509.
- Markus, M Lynne, Quang ” Neo” Bui. 2012. Going concerns: the governance of interorganizational coordination hubs. *Journal of Management Information Systems* **28**(4) 163–198.
- Markus, M Lynne, Claudia Loebbecke. 2013. Commoditized digital processes and business community platforms: new opportunities and challenges for digital business strategies. *MIS Quarterly* **37**(2) 649–654.
- Markus, M Lynne, Charles W Steinfield, Rolf T Wigand. 2006. Industry-wide infor-

- mation systems standardization as collective action: the case of the us residential mortgage industry. *MIS Quarterly* 439–465.
- Marwell, Gerald, Pamela Oliver. 1993. *The Critical Mass in Collective Action*. Cambridge: Cambridge University Press.
- McLaren, Tim, Milena Head, Yufei Yuan. 2002. Supply chain collaboration alternatives: understanding the expected costs and benefits. *Internet Research* **12**(4) 348–364.
- Metcalfe, R. 1997. Pollinate lets you rent the software you need for just the right amount of time. *Infoworld* **19**(23) 111.
- Meyer, Christine Benedicte. 2001. A case in case study methodology. *Field methods* **13**(4) 329–352.
- Misra, Vishal, Stratis Ioannidis, Augustin Chaintreau, Laurent Massoulié. 2010. Incentivizing peer-assisted services: a fluid shapley value approach. *ACM SIGMETRICS Performance Evaluation Review*, vol. 38. ACM, 215–226.
- Monge, Peter R, Janet Fulk, Michael E Kalman, Andrew J Flanagan, Claire Parnassa, Suzanne Rumsey. 1998. Production of collective action in alliance-based interorganizational communication and information systems. *Organization Science* **9**(3) 411–433.
- Mukhopadhyay, Tridas, Sunder Kekre, Suresh Kalathur. 1995. Business value of information technology: a study of electronic data interchange. *MIS Quarterly* 137–156.
- Nagarajan, Mahesh, Greys Sošić. 2008. Game-theoretic analysis of cooperation among supply chain agents: Review and extensions. *European Journal of Operational Research* **187**(3) 719–745.
- Nault, Barrie R. 1997. Quality differentiation and adoption costs: The case for interorganizational information system pricing. *Annals of Operations Research* **71** 115–142.
- Nicolaou, Andreas I, D Harrison McKnight. 2006. Perceived information quality in data exchanges: Effects on risk, trust, and intention to use. *Information Systems Research* **17**(4) 332–351.
- Oi, Walter Y. 1971. A disneyland dilemma: Two-part tariffs for a mickey mouse monopoly. *The Quarterly Journal of Economics* 77–96.
- Olson, Mancur. 1971. The logic of collective action. public goods and the theory of groups. *Harvard Economic Studies*, vol. 124. Harvard University Press.

- Özener, Okan Örsan, Özlem Ergun. 2008. Allocating costs in a collaborative transportation procurement network. *Transportation Science* **42**(2) 146–165.
- Paré, Guy. 2004. Investigating information systems with positivist case research. *Communications of the association for information systems* **13**(1) 18.
- Park, Namsu, Kerk F Kee, Sebastián Valenzuela. 2009. Being immersed in social networking environment: Facebook groups, uses and gratifications, and social outcomes. *CyberPsychology & Behavior* **12**(6) 729–733.
- Pasura, Aiyappa, Lynette Ryals. 2005. Pricing for value in ict. *Journal of Targeting, Measurement and Analysis for Marketing* **14**(1) 47–61.
- Pilkington, Marc. 2016. 11 blockchain technology: principles and applications. *Research handbook on digital transformations* 225.
- Porter, Michael E. 2000. Location, competition, and economic development: Local clusters in a global economy. *Economic development quarterly* **14**(1) 15–34.
- Power, Damien, Richard L Gruner. 2017. Variable use of standards-based IOS enabling technologies in Australian SMEs: an examination of deliberate and emergent decision making processes. *European Journal of Information Systems* **26**(2) 164–184.
- Premkumar, G, Keshavamurthy Ramamurthy, Sree Nilakanta. 1994. Implementation of electronic data interchange: an innovation diffusion perspective. *Journal of Management Information Systems* 157–186.
- Raghunathan, Srinivasan. 2003. Impact of demand correlation on the value of and incentives for information sharing in a supply chain. *European Journal of Operational Research* **146**(3) 634–649.
- Ratnasingam, Pauline. 2000. The influence of power on trading partner trust in electronic commerce. *Internet Research* **10**(1) 56–63.
- Reinhardt, G, M Dada. 2005. Allocating the gains from resource pooling with the shapley value. *Journal of the Operational Research Society* **56**(8) 997–1000.
- Riggins, Frederick J, Charles H Kriebel, Tridas Mukhopadhyay. 1994. The growth of interorganizational systems in the presence of network externalities. *Management Science* **40**(8) 984–998.
- Robey, Daniel, Ghiyoung Im, Jonathan D Wareham. 2008. Theoretical foundations of empirical research on interorganizational systems: Assessing past contributions and guiding future directions. *Journal of the Association for Information Systems* **9**(9).

- Rochet, Jean-Charles, Jean Tirole. 2003. Platform competition in two-sided markets. *Journal of the European Economic Association* **1**(4) 990–1029.
- Rodon, Juan, Joan Antoni Pastor, Feliciano Sesé, Ellen Christiaanse. 2008. Unravelling the dynamics of iois implementation: an actor-network study of an iois in the seaport of Barcelona. *Journal of Information Technology* **23**(2) 97–108.
- Rodon, Juan, Juan Ramis-Pujol. 2006. Exploring the intricacies of integrating with a port community system. *Bled eConference, Bled, Slovenia* 1–15.
- Rodón, Juan, Feliciano Sesé. 2010. Analysing iois adoption through structural contradictions. *European Journal of Information Systems* **19**(6) 637–648.
- Rolland, Knut H, Lars Mathiassen, Arun Rai. 2018. Managing digital platforms in user organizations: The interactions between digital options and digital debt. *Information Systems Research* .
- Sahin, Funda, E. Powell Robinson. 2002. Flow coordination and information sharing in supply chains: Review, implications, and directions for future research. *Decision Sciences* **33**(4) 505–536.
- Schmeidler, David. 1969. The nucleolus of a characteristic function game. *SIAM Journal on Applied Mathematics* **17**(6) 1163–1170.
- Seidman, Stephen B. 1983. Network structure and minimum degree. *Social Networks* **5**(3) 269 – 287.
- Shapley, Lloyd S. 1953. A value for n-person games. Tucker A.W. Kuhn, H.W., ed., *Contributions to the Theory of Games (Annals of Mathematics Studies 28)*, vol. II. 307–317.
- Shim, Simon SY, Vishnu S Pendyala, Meera Sundaram, Jerry Z Gao. 2000. Business-to-business e-commerce frameworks. *IEEE Computer* **33**(10) 40–47.
- Son, Jai-Yeol, Sridhar Narasimhan, Frederick J Riggins. 2005. Effects of relational factors and channel climate on EDI usage in the customer-supplier relationship. *Journal of Management Information Systems* **22**(1) 321–353.
- Steinfield, Charles, M Lynne Markus, Rolf T Wigand. 2011. Through a glass clearly: standards, architecture, and process transparency in global supply chains. *Journal of Management Information Systems* **28**(2) 75–108.
- Sundararajan, Arun. 2004. Nonlinear pricing of information goods. *Management Science* **50**(12) 1660–1673.
- Suri, N Rama, Yadati Narahari. 2008. Determining the top-k nodes in social networks using the Shapley value. *Proceedings of the 7th international joint conference*

- on Autonomous agents and multiagent systems-Volume 3*. International Foundation for Autonomous Agents and Multiagent Systems, 1509–1512.
- Teo, Hock-Hai, Kwok Kee Wei, Izak Benbasat. 2003. Predicting intention to adopt interorganizational linkages: an institutional perspective. *MIS Quarterly* 19–49.
- Tian, Feng. 2016. An agri-food supply chain traceability system for china based on RFID & blockchain technology. *Service Systems and Service Management (ICSSSM), 2016 13th International Conference on*. IEEE, 1–6.
- Tilson, David, Carsten Sørensen, Kalle Lyytinen. 2012. Change and control paradoxes in mobile infrastructure innovation: the Android and iOS mobile operating systems cases. *2012 45th Hawaii International Conference on System Sciences*. IEEE, 1324–1333.
- Tiwana, Amrit, Benn Konsynski, Ashley A Bush. 2010. Research commentary—platform evolution: Coevolution of platform architecture, governance, and environmental dynamics. *Information systems research* **21**(4) 675–687.
- Truman, Gregory E. 2000. Integration in electronic exchange environments. *Journal of Management Information Systems* **17**(1) 209–245.
- Tuunainen, Virpi Kristiina. 1998. Opportunities of effective integration of EDI for small businesses in the automotive industry. *Information and Management* **34**(6) 361–375.
- Van Alstyne, Marshall, Erik Brynjolfsson, Stuart Madnick. 1995. Why not one big database? principles for data ownership. *Decision Support Systems* **15**(4) 267–284.
- Van Baalen, Peter, Rob Zuidwijk, Jo Van Nunen. 2009. Port inter-organizational information systems: Capabilities to service global supply chains. *Foundations and Trends (R) in Technology, Information and Operations Management* **2**(2-3) 81–241.
- Van Baalen, Peter J, Marcel van Oosterhout, Yao-Hua Tan, Eric van Heck. 2000. *Dynamics in Setting Up an EDI Community: Experiences from the Port of Rotterdam*. Delft: Eburon.
- Van Heck, Eric, Peter Vervest. 2008. Smart business networks: How the network wins. *Smart Business Networks. A new business paradigm*. SBNi, 15–35.
- Van Oosterhout, Marcel. 2009. Organizations and flows in the network. Peter Van Baalen, Rob Zuidwijk, Jo Van Nunen, eds., *Port Inter-Organizational Information Systems: Capabilities to Service Global Supply Chains*. Hanover: Now publishers, pp. 93–102.

- Venkatesh, Viswanath, Hillol Bala. 2012. Adoption and impacts of interorganizational business process standards: role of partnering synergy. *Information Systems Research* **23**(4) 1131–1157.
- Volkoff, Olga, Yolande E Chan, EF Peter Newson. 1999. Leading the development and implementation of collaborative interorganizational systems. *Information & Management* **35**(2) 63–75.
- Wang, Charles X, Michel Benaroch. 2004. Supply chain coordination in buyer centric b2b electronic markets. *International Journal of Production Economics* **92**(2) 113–124.
- Webster, Juliet. 1995. Networks of collaboration or conflict? Electronic data interchange and power in the supply chain. *The Journal of Strategic Information Systems* **4**(1) 31–42.
- Wigand, Rolf T, Charles W Steinfield. 2005. Information technology standards choices and industry structure outcomes: The case of the US home mortgage industry. *Journal of Management Information Systems* **22**(2) 165–191.
- Wise, Richard, David Morrison. 2000. Beyond the exchange: The future of b2b. *Harvard Business Review* **78**(6) 86 – 96.
- Wu, Shin-yi, Rajiv D Banker. 2010. Best pricing strategy for information services. *Journal of the Association for Information Systems* **11**(6) 339–366.
- Xue, Ling, Cheng Zhang, Hong Ling, Xia Zhao. 2013. Risk mitigation in supply chain digitization: system modularity and information technology governance. *Journal of Management Information Systems* **30**(1) 325–352.
- Ye, Fei, Zhiqiang Wang. 2013. Effects of information technology alignment and information sharing on supply chain operational performance. *Computers & Industrial Engineering* **65**(3) 370 – 377.
- Yin, Robert K. 2004. *The Case Study Anthology*. Thousand Oaks: SAGE Publications.
- Yin, Robert K. 2017. *Case study research and applications: Design and methods*. Sage publications.
- Yoo, Byungjoon, Vidyanand Choudhary, Tridas Mukhopadhyay. 2002. A model of neutral b2b intermediaries. *Journal of Management Information Systems* **19**(3) 43–68.
- Yoo, Byungjoon, Vidyanand Choudhary, Tridas Mukhopadhyay. 2011. A study of sourcing channels for electronic business transactions. *Journal of Management Information Systems* **28**(2) 145–170.

- Yoo, Youngjin, Ola Henfridsson, Kalle Lyytinen. 2010. Research commentary-the new organizing logic of digital innovation: An agenda for information systems research. *Information Systems Research* **21**(4) 724–735.
- Young, H Peyton. 1994. Cost allocation. *Handbook of game theory with economic applications* **2** 1193–1235.
- Zhao, Kexin, Mu Xia. 2014. Forming interoperability through interorganizational systems standards. *Journal of Management Information Systems* **30**(4) 269–298.
- Zhao, Kexin, Mu Xia, Michael J Shaw. 2007. An integrated model of consortium-based e-business standardization: collaborative development and adoption with network externalities. *Journal of Management Information Systems* **23**(4) 247–271.
- Zhu, Kevin, Kenneth L Kraemer, Vijay Gurbaxani, Sean Xin Xu. 2006. Migration to open-standard interorganizational systems: network effects, switching costs, and path dependency. *MIS Quarterly* 515–539.

Summary

Over the decades, companies have been working on making communications with their partners faster, cheaper, and more reliable. Today, every organization uses at least some type of an interorganizational information system in its routine operations, whether for communication with their business partners or with authorities. Interorganizational information systems (IOSs) are information systems shared by two or more organizations. IOSs can support a variety of interactions: customer relationship management, airline reservations, transportation tracking, and so on. One of the unifying characteristics of all IOSs is that they bring value to their adopter only if other companies have also adopted the system; this adoption depends on how well the interests of different companies have been integrated into the IOS design.

In Chapter 2, we narrow our focus to a single IOS — the business community platform. Based on an exploratory case study, we discover that traditional cost-based pricing methods result in tension among IOS users because some of them feel as if they are contributing a lot of data to the platform without receiving appropriate acknowledgment or reward in return. Furthermore, the business community platform structure more easily enables services within the platform to have a hierarchical structure in which old services provide data input for new services. To properly reimburse the companies providing data to the business community platform, we propose a new pricing strategy that relies on two building blocks: user value-based pricing and fair sharing. We show that such a pricing approach aligns the incentives for individual users to adopt a business community platform and reap community-wide benefits from the platform's introduction.

In Chapter 3, we consider the application of the new pricing strategy to a more general case of any vertical IOS, that targets competitors as their user community. We demonstrate that a fair sharing scheme can create additional incentives for co-opetition, simultaneous competition, and cooperation, among IOS adopting competitors by estimating the value gain for a data provider that comes from the participation of another data provider. The size of the positive externalities among IOS data providers depends on the business community network structure. In turn, this structure determines the importance of coordination among competitors for IOS adoption. In high-density networks, the benefits from coordination are higher than in low-density networks.

In Chapter 4, we demonstrate how different companies' interests affect the development of IOSs at the business community level. To describe the process, we introduce a new concept: the landscape of interorganizational information systems. We rely on collective action theory, and consider how opposing strategies of actors shape the IOS landscape and preclude the business community from attaining the landscape that represents the collective level optimum because of the exclusive nature of this public good. Individual firms, alliances, and community representatives push the IOS landscape toward more standardization, more hub-type connections, and less substitutable IOSs, or toward less standardization, more point-to-point connections, and more substitutable IOSs. We support our theoretical propositions with evidence from a Rotterdam seaport case study.

Overall, this research contributes to the IOS literature by stressing the importance of interests' alignment when developing IOSs for maximizing business community gains from IOS adoption. We provide a detailed investigation into how the pricing mechanism based on fair sharing can serve as an instrument for achieving such an alignment. We believe that research and practice would benefit from research into other managerial instruments to align the interests of IOS users.

Dutch Summary / Nederlandse Samenvatting

In de afgelopen decennia hebben bedrijven veel geïnvesteerd in informatie- en communicatietechnologie (ICT) om de communicatie met hun partners sneller, goedkoper en betrouwbaarder te maken. Vrijwel elke organisatie maakt tenminste gebruik van één soort inter-organisatieel informatiesysteem in haar dagelijkse operaties om te communiceren met haar bedrijfspartners of met overheden. Inter-organisatiele informatiesystemen (IOS's) zijn informatiesystemen die gebruikt worden door meerder organisaties. Een IOS kan verschillende soorten interacties ondersteunen: customer relationship management, vluchtreserveringen, traceren van transport, etc. Kenmerkend voor al deze IOS's is dat ze alleen waarde kunnen creëren wanneer ook andere organisaties van de IOS gebruikmaken. Dit hangt weer af van de mate waarin de belangen van de deelnemende bedrijven zijn geïntegreerd in het IOS-ontwerp.

In hoofdstuk 2 richten we ons onderzoek op een individuele IOS als een platform voor een bedrijfsnetwerk. Op basis van een verkennende case study, vinden we dat traditionele kost-gebaseerde prijsbepalingsmethoden tot spanningen leiden tussen IOS-gebruikers, omdat enkele bedrijven menen dat ze veel data bijdragen aan het platform zonder hiervoor de juiste erkenning of beloning te krijgen. Bovendien maakt de algemene structuur van een bedrijfsnetwerk platform het mogelijk de diensten hiërarchisch te op te bouwen, waarbij bestaande diensten gegevens leveren voor nieuwe diensten. Om de bedrijven die data leveren aan een bedrijfsnetwerk platform op gepaste te compenseren, stellen we een nieuwe prijsbepalingsstrategie voor die bestaat

uit twee onderdelen: prijsbepaling gebaseerd op gebruikerswaarde en prijsbepaling op basis van eerlijk delen. We laten zien dat dergelijke prijsmethoden gebruikers er toe kunnen bewegen een bedrijfsnetwerkplatform in gebruik te nemen en zo het netwerkwide voordeel van het platform te bewerkstelligen.

In hoofdstuk 3 overwegen we de toepassing van een nieuwe prijsstrategie op een meer algemene situatie van IOS die zich richt op concurrenten en hun gebruikersnetwerk. We laten zien dat een eerlijk delen-strategie drijfveren kan creëren voor co-opetition \neg , d.w.z. samenwerking tussen concurrenten die de IOS adopteren. Dit gebeurt door het schatten van de waarde-toevoeging voor een gegevensprovider veroorzaakt door de deelname van een andere gegevensprovider. De grootte van positieve externaliteiten tussen IOS gegevensproviders hangt af van de netwerkstructuur van het bedrijfsnetwerk, die op zijn beurt het belang van coördinatie tussen concurrenten voor IOS-acceptatie bepaalt. De voordelen van coördinatie zijn groter in netwerken met hoge dichtheid dan in netwerken met lage dichtheid.

In hoofdstuk 4 laten we zien hoe de belangen van verschillende bedrijven van invloed zijn op de ontwikkeling van een IOS op het bedrijfsnetwerk niveau. Om dit proces te kunnen beschrijven, introduceren we eerst een nieuw concept: het domein van inter-organisationale informatiesystemen. Gebaseerd op de collectieve actietheorie, onderzoeken we hoe tegenstrijdige strategieën van spelers het IOS domein vormgeven en voorkomen dat het bedrijfsnetwerk het stadium van het collectieve optimum bereikt, vanwege het exclusieve karakter van dit publieke goed. Individuele bedrijven, allianties en netwerkvertegenwoordigers duwen het IOS domein hetzij naar meer standaardisatie, meer hub-achtige verbindingen en minder substitueerbare IOS's, of naar minder standaardisatie, meer point-to-point verbindingen en meer substitueerbare IOS's. Wij onderbouwen onze theoretische veronderstellingen aan de hand van een empirische case study van de Rotterdamse zeehaven.

Samenvattend, dit onderzoek draagt bij aan het IOS-onderzoek door de nadruk te leggen op het belang van het op één lijn brengen van belangen bij de ontwikkeling van IOS en om op deze wijze de winsten voor het bedrijfsnetwerk uit de IOS-acceptatie te maximaliseren. We onderzoeken in detail hoe het prijsbepalingsmechanisme op basis van een eerlijk delen-strategie helpt om een

dergelijke afstemming te bereiken. Wij zijn van mening dat zowel onderzoek als praktijk baat hebben bij verder onderzoek naar andere managementinstrumenten ten behoeve van de afstemming van de belangen van IOS gebruikers.

About the Author



Irina Romochkina was born on October 13, 1987, in Yangiyul, the USSR. She completed her high school education in 2004 and graduated with excellence from Vladimir Commercial Lyceum. Irina continued her education at Lomonosov Moscow State University and received her Bachelor of Science in Economics degree with distinction in 2008. After the completion of her undergraduate studies, Irina worked as an intern for Volkswagen Group Rus. In 2009, Irina started the MPhil in Business Research program with a concentration in Logistics and Information Systems, offered by ERIM at Erasmus University Rotterdam. In 2011, she successfully received her Master of Science degree with appellation Cum Laude. The work on her master thesis inspired Irina to continue the academic track. During the same autumn, she joined the department of Decision and Information Sciences of Rotterdam School of Management as a Ph.D. Candidate.

Irina's research focuses on logistics interorganizational information systems, specifically the interests that companies pursue when developing such systems and the different incentive alignment mechanisms being applied in this context. During her Ph.D. trajectory, Irina closely cooperated with practitioners by being a member of two research projects: NLI (National Logistics Infrastructure), funded by the Dutch government, and CASSANDRA (Common Assessment and Analysis of Risk in Global Supply Chains), funded by the European Union. The resulting work has been presented at various

workshops and conferences, including the European Academy of Management Conference, the Institute for Operations Research and the Management Sciences Conference. Irina also has been involved as a teaching assistant for the following master's level courses: Global Logistics and Information Technology and Ports in Global Networks.

Since 2014, Irina has been working as a management consultant for Kearney. In this role, Irina has been focusing on projects in the logistics field in which advanced analytics methods are applied. This position allows Irina to apply her academic background to solving specific problems faced by practitioners.

Portfolio

Working papers and papers currently under review

- Romochkina, I., van Baalen, P.J., Zuidwijk, R.A. “A Tug-of-War: Shaping the Landscape of Interorganizational Information Systems.”
- Romochkina, I., Zuidwijk, R.A., van Baalen, P.J. “A Strategy to Address Business Community Platforms Pricing Challenges.”
- Romochkina, I., Zuidwijk, R.A., van Baalen, P.J. “Boosting Co-Opetition with Fair Sharing Approach for Interorganizational Information Systems.”

Professional publications

- Nijdam, M., Romochkina, I., van Oosterhout, M. 2012. “CASSANDRA: Stakeholder Analysis”. European Commission, Seventh Framework Programme, Theme Monitoring and tracking of shipping containers security, FP7-SEC-2010-3.2-1, GA No. 261795, Public deliverable.

Conference presentations

- Digital Platforms: Towards the Third Generation of Port Community Systems (2012). European Academy of Management, Rotterdam, The Netherlands
- Pricing Data Elements with the Use of Shapley Value (2013). INFORMS, Minneapolis, United States

The ERIM PhD Series

The ERIM PhD Series contains PhD dissertations in the field of Research in Management defended at Erasmus University Rotterdam and supervised by senior researchers affiliated to the Erasmus Research Institute of Management (ERIM). All dissertations in the ERIM PhD Series are available in full text through the ERIM Electronic Series Portal: <http://repub.eur.nl/pub>. ERIM is the joint research institute of the Rotterdam School of Management (RSM) and the Erasmus School of Economics (ESE) at the Erasmus University Rotterdam (EUR).

Dissertations in the last four years

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