Exploring factors that influence information sharing choices of organizations in networks

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Abstract

Organizations do not just decide on whether or not to exchange information digitally. In many cases, there are multiple alternative configurations of inter-organizational systems (IOS) that facilitate such information sharing. Although a lot is known about the factors that influence whether organizations do or do not adopt IOS, little is known about how these factors work when organizations are choosing among multiple configurations for information sharing. This paper takes two archetypical IOS forms - dyadic and multilateral arrangements – and explores how the known antecedents affect choosing among them. To this end, a case study was conducted on the selection and development of an IOS for information sharing in a network of utility service and infrastructure providers.

Keywords

IOS, configuration, choices, adoption, networks

Introduction

Organizations today are increasingly exchanging information with parties outside their organizational boundaries because of globalization, rapid technological developments and government reforms (Jones et al. 2008; Lempinen et al. 2012). Inter-organizational systems (IOS) are automated information systems that are shared by two or more organizations (Barrett et al. 1982; Cash et al. 1985; Chatterjee et al. 2004; Robey et al. 2008). Much research has been done on the factors that influence the decision of organizations whether to adopt a specific IOS or not (see Robey et al. 2008). However, in practice IOS adoption is often not yes-or-no decision; organizations are faced with various options for configuring the way they share information with partners in a network. Little is yet known about why organizations choose for one specific information sharing configuration when two or more different options are present (Da Silveira et al. 2006). The known adoption factors were often found in dyadic or 1-to-n (one-to-many) relationships, with an IOS 'sponsor' (Johnston et al. 1988), presenting business partners with the decision to adopt the IOS or not. Today, n-to-n (many-to-many) relationships are a common basis for IOS. This paper sets out to explore the (potentially moderating) impact of having multiple IOS configuration options on the known IOS adoption factors. We specifically address the choice between a dyadic and a multilateral configuration for information sharing as two archetypical forms (Choudhury, 1997). We address the following research question:

Which IOS adoption factors influence an organization's choice between a dyadic and a multilateral IOS configuration for information sharing in a network setting?

To answer this question, we conducted an in-depth case study on the selection of a new information sharing arrangement in the underground utility sector in the Netherlands. This case was selected as the network of actors comprises both of large, powerful operators and a number of medium sized operators and smaller companies. The structure of this paper is as follows. Section 2 will elaborate on the theoretical background and further detail the research problem. Section 3 discusses the research methodology.

Section 4 will explain the results of the case study. Thereafter section 5 will present the findings by integrating the theory with the results of the case study. Section 6 concludes on these findings.

Theoretical background

IOS are automated information systems that are shared by two or more organizations. IOS support buyer-seller dyads by enabling computer-to-computer information exchange for the purpose of facilitating business transactions (Hansen et al. 1989). It is often assumed that with IOS there is a project sponsor or project champion that provides for leadership (Volkoff et al. 1999). However, research has also shown that sub-optimal outcomes can result from parties exploiting their power to enforce other parties to adopt IOS (Hart et al. 1997).

IOS configurations

Although many typologies of inter-organizational systems exist, there is no widely accepted framework of IOS configurations (Da Silveira et al. 2006). Choudhury (1997) developed a typology of IOSs that support exchanges between buyers and suppliers. The framework distinguishes between two extremes: dyadic and multilateral IOS configurations. Dyadic IOS, shown in Figure 1, support bilateral exchanges between a selected number of partners.

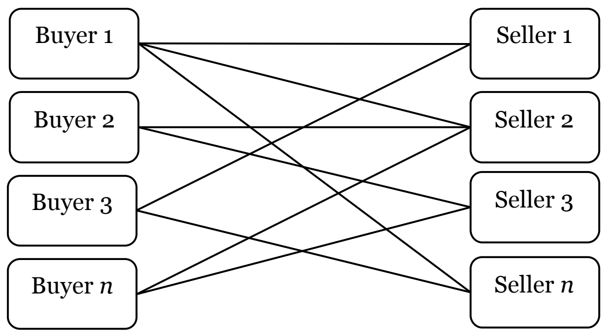

Figure 1. Electronic dyads (adapted from Choudhury 1997)

Multilateral IOS allow organizations to communicate with a large number of partners (Choudhury 1997). An electronic market, illustrated in Figure 2, is an example of a multilateral IOS as it brings together buyers and sellers through a single system (Malone et al. 1987). Baron et al. (2000) argued that multilateral IOS reduce switching costs, as they make it easier to find alternative suppliers. Furthermore, Stank et al. (2001) suggested that multilateral IOS may lead to improved collaboration and supply chain integration. According to Da Silveira et al. (2006), however, the role and the benefits of multilateral IOS compared to dyadic IOS are uncertain.

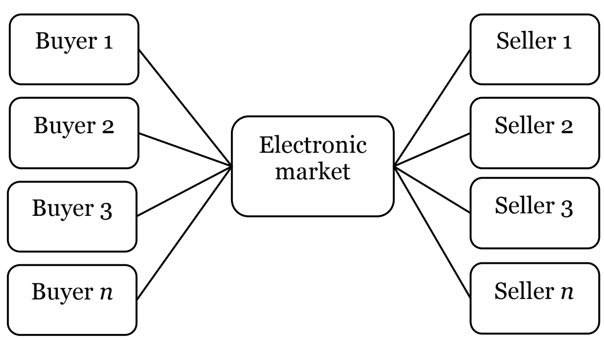

Figure 2. Multilateral IOS (adapted from Choudhury 1997)

IOS choice and adoption

The factors that influence choosing between dyadic and multilateral IOS have not been widely discussed and existing evidence is not unequivocal (Da Silveira et al. 2006). The traditional approach to choosing between dyadic and multilateral IOS has been to consider the number of buyers and sellers (Choudhury 1997). Based on transaction costs economics, Malone et al. (1987) have argued that interfirm communications develop as electronic markets when many purchasers and suppliers are involved, and as electronic hierarchies when a pre-defined set of purchasers and suppliers is involved. According to Choudhury (1997), electronic markets correspond to multilateral IOS while electronic hierarchies resemble dyadic IOS.

Another factor that appears to influence IOS choices is the type of relationship. Choudhury (1997) has found that multilateral IOS are mainly deployed in spot markets as it results in electronic brokerage benefits. However, others (Ronchi 2003; Stank et al. 2001) gave a more diverse view by suggesting that multilateral IOS both support arms-length and collaborative relationships. Da Silveira et al. (2006) indicate that dyadic IOS are perhaps more oriented towards dedicated information exchange while multilateral IOS are mostly seen as transaction facilitators. These insights do not provide a clear answer to the main research question.

Many researchers have examined *why* organizations would adopt IOS at all (Elgarah et al. 2005). This IOS adoption literature refers to whether organizations adopt IOS or not (and thus not so much regard choosing between IOS configurations). Still, it may provide direction for factors that influence IOS choices. shows seven factors derived from literature that influence IOS adoption.

Table 1: known factors (from literature) influencing IOS adoption

Factor	Source
Firm size	Grover (1993), Premkumar et al. (1997)
Availability of resources	Grover (1993), Premkumar et al. (1997), Markus (2006), Tuunainen (1998)
Power	Hart et al. (1997), Chwelos et al. (2001), Premkumar et al. (1997)
Amount of transactions	Markus (2006), Tuunainen (1998)
Process compatibility	Venkatesh et al. (2012)
IT maturity	McGrath et al. (2001), Markus (2006), Grover (1993), Mäkipää (2006)
Number of interfaces	McGrath et al. (2001)

The first factor is firm size. Large firms are known to adopt IOS easier (Grover 1993; Markus 2006; Premkumar et al. 1997; Tuunainen 1998). The second factor is the ability of mobilizing resources for adopting inter-organizational IT (Grover 1993; Premkumar et al. 1997). These resources include technical resources, financial resources and IT knowledge. Third, trading partners are known to influence each other by exploiting their power to force IOS adoption (Chwelos et al. 2001; Hart et al. 1997). Hart et al. (1997), however, have argued that IOS yield more benefits when firms are internally motivated to adopt such systems. A fourth factor is the amount of transactions (Markus 2006; Tuunainen 1998). Smaller parties typically have fewer transactions compared to large parties. Consequently, their potential benefits are relatively low and IOS adoption is less attractive (Markus 2006; Tuunainen 1998). Fifth, according to Venkatesh et al. (2012) process compatibility is an important concern because IOS often require substantial changes to business processes. The latter increases the burden for IOS adoption because many firms have rigid routines that are deeply embedded in their value systems. Moreover, organizations stop doing business with trading partners if information exchange arrangements and processes differ too much (Premkumar et al. 1997). A sixth factor for IOS adoption is IT maturity. IT maturity can refer to the use of ICT in organizations (Chwelos et al. 2001; Grover 1993; Markus 2006). Paper based information storage, for example, is not a good starting point for IT facilitated information exchange (Mäkipää 2006). IT maturity can also refer to the degree in which information systems (IS) are integrated within organizations. Poorly integrated IS make IOS adoption more difficult (McGrath et al. 2001). Lastly, a reason for IS to be often poorly integrated is the large amount of interfaces. Systems typically talk to each other on a 1:1 basis. The amount of interfaces roughly increases exponentially with the number of systems. Having many interfaces requires considerable development and increases processing and maintenance costs (McGrath et al. 2001). McGrath et al. (2001) argued that adopting IOS becomes increasingly challenging with an increasing number of interfaces.

Theory synthesis

Two conclusions can be drawn from the literature discussed. First, IOS research to date has given little attention to information exchange in network settings (n-n relationships). The framework of Barringer et al. (2000) does mention networks as a form of inter-organizational *relationships*, but describes it as "a hub and wheel configuration, with a local firm at the hub organizing the interdependencies of a complex array of firms". Arguably, the latter regards 1-n relationships and not n-n relationships because a single party governs the interactions. Similarly, EDI is typically deployed in supply chains for connecting an organization with a limited number of partners (thus 1-n type of relationships) (Hansen et al. 1989). Having multiple connections between multiple points (n-n) is more complex than having a single point connected to multiple points (1-n) (Veeneman 2004). N-n networks are likely to involve different or additional challenges because there is not a single organization managing all interdependencies.

Second, from existing literature it is unclear why organizations choose for a particular IOS configuration. In fact, as discussed in this section, existing literature is contradictory. There is, however, much research conducted into whether or not parties adopt IOS. It might well be that these factors also influence the information exchange choices of organizations. To test this proposition, the next section will present the methodology for exploring if and how these factors influence information exchange choices of organizations. The seven factors presented in will act as a framework for the investigation.

Research approach

To gain a deeper understanding of which adoption factors influence the choice for a specific IOS configuration, an explorative case study approach was used which was in the process of selecting an information sharing arrangement.. A case study allows for providing a rich understanding of what lies behind the aforementioned factors. With a case study, an empirical phenomenon is investigated within its real context (Yin 2013). The empirical phenomenon is the IOS that is to be developed in the underground utility infrastructure sector in the Netherlands. The case was selected for answering the research question because it offers a network with various stakeholders within a sector, with a high level of complexity because of n-n relationships in the sector. This is an important case characteristic because for these networks, multilateral configurations are potentially beneficial. At the same time, the organizational network comprises a number of medium-sized and smaller actors that are expected to gain less from such a configuration and might prefer dyadic configurations.

The methods used include semi-structured interviews, observations and content analysis. Semi-structured interviews allow the interviewer to dig deeper by asking additional questions if that is found to be necessary (Yin 2013). The interviews have been conducted with three network operators and two contractors because information is mainly exchanged between network operators and contractors. The parties differ in firm size and provide different utility services (i.e. they are not competitors). As discussed in the previous section, firm size may influence the IOS configuration preferences of organizations. Table 2 characterizes the three network operators.

Table 2: characteristics network operators

	Network operator in water sector	**Network operator in telecommunications sector**	**Network operator in electricity and gas sector**
Size	Small network operator	Medium-sized network operator	Large network operator
Number (#) of service connections	750.000	2.8 million	4.8 million (gas & electricity)
# of projects/year	~2000	5000 - 10.000	100.000 – 200.000
# of contractors	1	5	20
Number of combi regions in which they operate	1	5	2

Multiple interviewees were targeted per organization in order to triangulate their views. Primary data sources included middle and lower management because these agents are closest to the current information flows (as suggested by Hart et al. 1997). The interviewees were selected in such a way that both business aspects and IT aspects would come forward. Positions of the in total sixteen interviewees included business analysts, information architects, project managers, region managers (of underground utility infrastructure departments) and heads of IT departments. The duration of the interviews varied from a minimum of one hour to three hours. Answers have been coded according to the framework of , whilst staying open to factors that were not posited in the literature.

Case study

Introduction

The underground utility infrastructure sector consists of physical networks over which utility services (gas, electricity, water, heating and telecommunications) are provided. These infrastructures need to be maintained and expanded. The entirety of information and files required for successful execution of such projects (e.g. address information, topographic maps, technical drawings, invoices) is exchanged between three main stakeholders: a network operator, an applicant and a contractor.

The network operator is the owner of the infrastructure and is responsible for its maintenance. Network operators typically outsource the actual construction work to contractors. Applicants are typically individuals, businesses, project developers and municipalities. Besides the three main stakeholders, there are other parties involved, such as authorities (for permits), project developers (construct buildings that have to be connected) and other network operators (when multiple infrastructures are built simultaneously).

Some buildings, such as new housing, must be connected to multiple utility services networks. Multiple network operators and contractors collaborate to avoid that in such a case each network operator with its own contractor has to build its infrastructure separately. If an application involved two or more utility services, network operators decide whether to cooperate. If they decide to do so, a single contractor builds all (types of) infrastructures; this will be referred to as *combi* projects. When only one network (operator) is involved, construction work is *solo*. Prior arrangements have been made for combi collaborations per region, and large network operators often work in multiple regions.

Current information exchange arrangements

The prevalent way to exchange information throughout the underground utility infrastructure sector is by exchanging information manually. Actors use proprietary systems and information is shared by means of paper mail, telephone, e-mail or face-to-face meetings. Systems are not linked with each other. Network operators, for example, have project management systems in which address information of applicants is stored. Contractors need the address information in order to determine which building is to be connected. Such information is manually transferred from network operator to contractor. The contractors re-key the information in their own system so that technicians know where to go.

When it comes to the technical drawings of the infrastructures, organizations have often opened up their internal technical systems to contractors. Those contractors can make any necessary design revisions (the final underground infrastructure often deviates slightly from the original design) directly in the Geographic Information Systems of the network operators, which were formally only used internally. Hence, the *intra*-organizational systems have been converted into *inter*-organizational systems, but they remain proprietary IOS solutions controlled by the operators.

The interviews show that these current information exchange arrangements are inefficient, one of the contractors: “processes are working well, but there is still a lot to be gained in working more efficiently”. With manual information exchange, information is rekeyed, transferring information takes time (which increases lead times) and errors occur due to the many handover moments. Furthermore, in particular contractors have difficulties with the information exchange with a proprietary IOS because they have to work in multiple external systems. One contractor indicated that “all network operators develop their own devices and associated software". This becomes especially evident in the aforementioned combi projects. Contractors typically put infrastructure of multiple network operators in same gutter, making the topographical designs similar for each network operator. As a result, contractors have to enter the same information multiple times in different systems, because the network operators require them to do so.

Alternative information exchange arrangements

Network operators and contractors are collectively looking for ways to improve information sharing because of the aforementioned problems. Most of the parties that collaborate in the combi regions have joined forces to develop a nationwide information-sharing platform. Figure 3 schematically shows the IOS that parties have in mind. The IOS connects systems of network operators with systems of contractors. In concept, the platform allows the exchange of both information and files using web technologies. The proposed system is more than a serving hatch. Data will be recorded centrally because that allows parties that have no systems to store and modify information through a web-portal. The basic principle of the system is that each party can continue to use proprietary systems. Network operators and contractors are solely responsible for the connection to the IOS. This solution has different implications for the organizations we studied.

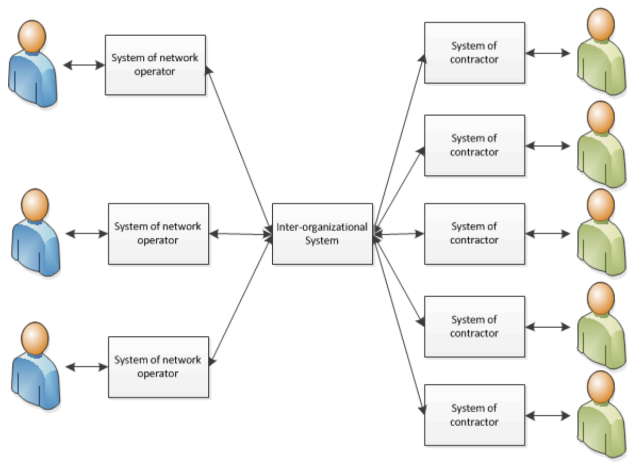

Figure 3. Multilateral IOS

Especially the larger parties are strongly in favor of this form of IOS as they have high potential gains because of their relatively high amount of projects. Furthermore, they work in multiple combi regions that currently all work in different ways. A nationwide platform would allow large parties to standardize and improve business processes. Contractors are also strongly in favor of the solution because they can use their own IT systems, instead of having to work in multiple systems.

For the smaller and medium sized parties (especially the operators), however, the preference is not as straightforward. The small network operator indicated they use one system for both combi and solo projects. Because this party is active in only one combi region, it is unlikely that the new system provides additional benefits, while the network operator has to make additional costs for connecting to the new system. Although parties considered rolling out one of the existing combi systems nationally, they refrained from that idea because network operators and contractors could not agree on which system to choose.

For the medium-sized operator, the choice is even more complicated. They would benefit more than the smaller organizations but also fear increased vulnerability. In contrast to small operators, the medium sized network operator currently has to deal with differences between combi regions. The IOS solution would allow them to standardize business processes across regions. In addition, compared to small network operators the potential benefits are higher due to the higher number of transactions. However, compared to large parties the number of annual projects is small. The latter makes it difficult for medium-sized organizations to recoup investments that are necessary to connect to the platform. The level of integration between existing systems is currently low and employees manually retrieve and rekey information. Therefore, many changes will be required in order to be able to offer information digitally to the nationwide IOS. The interviewee of the medium-sized network operator suggested that it is questionable whether it is economically feasible to make such large investments, with limited prospective gains.

These parties therefore considered an alternative IOS configuration: a dyadic IOS as illustrated in Figure 4. Here, systems of network operators share certain information with external systems through a link. For example, planning systems of the network operator and the contractor exchange the most recent version of the scheduled end date. The medium-sized operator suggested that with this solution they would become less dependent on a nationwide platform. The bilateral systems coupling scenario allows network operators to control which proprietary systems are used and how contractors should connect to these systems. The latter may reduce the risk of having to change the IT infrastructure according to externally imposed standards.

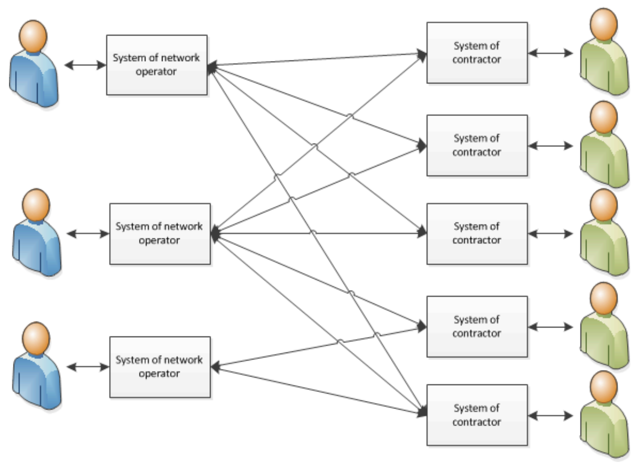

Figure 4. Dyadic IOS

The problem with a dyadic IOS is the complexity due to the exponential increase of interfaces with each new participant. In addition, parties have various system solutions and it is complex to let these systems talk with one another. However, for the medium-sized network operator, the negative effects are limited because they have a limited amount of contractors (five). According to the interviewees of the medium-sized network operator, managing five interfaces is doable. Nevertheless, a change in one system affects the operation other systems, which encompasses the risk of failures becoming widespread. Furthermore, it is complicated for larger parties to adopt and maintain dyadic IOS because of the high number of interfaces that have to be managed. The large number of interdependencies would increase the impact in case of a failure.

A challenge that applies to both of the two alternative information exchange arrangements is that processes in underground utility infrastructure projects change rapidly. The latter makes IT facilitated information exchange challenging because IT requires at least some degree of standardization. Infrastructure projects consist of various sub-processes. The actual sequence of the sub-processes depends on the type of project or workflow. Furthermore, in practice agents often deviate from formal workflows, as agents have to respond to unforeseen situations quickly. Projects can be delayed and costs might increase if IT systems do not allow for flexibility. By linking systems, either bilaterally or through multilateral IOS, processes will need to be standardized through agreements between parties. In particular agents in the execution stressed the value of flexibility with manual information exchange because it allows them to solve problems quickly. All of the above-discussed advantages and disadvantages are summarized in Table 3.

Table 3: advantages and disadvantages of the options

	Manual information exchange	Fully proprietary IOS	Dyadic IOS	Multilateral IOS
Pros	Low entry barrier & low set-up costs Flexible	Network operator has control over its own system Does not require high IT maturity	Parties have control over their own systems No duplication of effort Easier negotation	High potential gains for large parties Standardization of processes Parties have control over their own systems
Cons	Rekeying of information High project lead times	Contractors have to work in various non-proprietary and different systems Duplication of effort for contractors Unnecessary expenses for network operators	High complexity when having many partners Risk of failures becoming widespread due to interdependencies Inflexible in case of process changes	Requires high IT maturity High adoption costs for smaller parties Smaller parties cannot easily recoup costs due to low number of transactions High dependency on functioning of the IOS Inflexible in case of process changes

Discussion

IOS configurations

The two forms of IOS described in the background (electronic dyads and multilateral IOS; Choudhury, 1997) were candidates in the case study. The bilateral systems coupling alternative from the case represents electronic dyads as it facilitates bilateral exchanges between a number of selected partners. The multilateral IOS solution allows organizations to communicate with a large number of parties through a single system. A notable difference between the case study and the literature is that Choudhury (1997) focuses on exchange of resources between buyers and sellers while the case study IOS is built for solely the exchange of information between parties without such a relationship. The case study illustrates that parties focus on reducing costs by improving information sharing and not so much on enhancing market access as described by Choudhury (1997). The case study also shows that some form of IOS arises by default when opening-up internal (proprietary) systems to external parties.

Especially medium sized operators may lack the resources and capabilities necessary for taking a pro-active role in IOS decisions and implementation. Here the IOS choice affects the core information exchange arrangement for the entire sector. This is especially challenging as these parties can have less influence on a sector-wide IOS compared to the large parties in the sector, while also for the smaller parties their operations highly depend on it (Chen et al. 1998; Markus 2006; McGrath et al. 2001; Tuunainen 1998). Such parties are thus confronted with a dilemma: joining an IOS driven by the large parties in the network may result in benefits through improved information sharing, but there are risks of high costs, low utilization, lack of resources and increased dependencies (Markus 2006; Teo et al. 2003; Zhu et al. 2006).

IOS choices

Table 4 summarizes the integrated results of the adoption factors as found in theory and their prevalence in the choice for an IOS configuration. A first finding is that firm size does play a role in choosing IOS configurations. Large organizations favor the multilateral IOS solution because this solution yields them the most benefits. Smaller organizations favor other solutions because for them the benefits are limited. Moreover, smaller organizations have limited resources for substantial changes. Smaller parties are therefore more likely to opt for solutions that require fewer adjustments, such as manual data transfer. The latter is in line with findings that show that smaller parties typically adopt IOS slower (Grover 1993; Markus 2006; Premkumar et al. 1997; Tuunainen 1998). Also consistent with the literature (Chwelos et al. 2001; Hart et al. 1997) is that the case study observed that large parties persuade smaller parties to adopt a particular solution that is preferred by the large parties. If parties were allowed to choose independently of one another, they might choose alternative solutions.

Table 4: influence of known adoption factors on configuration choices in the case

Factor	Effects in the case	Case interview quote's
Firm size	Potential benefits for large organizations is higher	Small network operator: "our interest is very limited because small operators like us have little to no advantage of such system"
		Large network operator: "because of the size of our organization we can benefit a lot from efficiency gains"
Availability of resources	Smaller organizations have limited financial and personnel resources that are required for IT changes	Small network operator: "there will be a large (financial) impact if we have to adapt our systems" Large network operator: "we have already fully prepared our current system to be coupled"
Power	Large parties push a particular IOS solution	Medium-sized network operator: "we have very limited influence on the direction of a solution"
		Large network operator: "large parties will develop the [multilateral IOS] while smaller parties can piggyback on our efforts"
Amount of transactions	Importance of IT facilitated information exchange is higher for parties with more transactions	Small network operator: "we do not have sufficient projects to recoup the costs via efficiency gains"
		Medium-sized network operator: "with our amount of projects, it is questionable whether the efficiency gains justify the investments"
		Large network operator: "the number of projects will increase, hence our interest in efficiency improvements"
Process compatibility	IOS might not handle flexible processes	Small network operator: "there will be inefficiencies if current processes are crammed in IT systems"
		Medium-sized network operator: "big advantage of manual information exchange is that we can quickly respond to changing processes"

IT maturity	Poorly integrated systems makes IT facilitated information exchange more difficult	Small network operator: “we need to do various digitization steps before we can facilitate automated information exchange” Medium-sized network operator: “the current processes contain many manual operations”
Number of interfaces	High amount of systems used, whereby the high amount of interfaces makes communication between systems complex	Contractor: “every region and every network operator uses different systems which complicates coupling” Medium-sized network operator: “internal linking of the large amount of systems we use is already very complicated, let alone external links”

The amount of transactions is also relevant for the choice among IOS alternatives. Parties with a high amount of projects have a strong interest in IT-facilitated information exchange (and hence want to get rid of manual information exchange). Because of the high number of transactions, these parties can more easily recoup investments. In addition, it has been found that, as suggested by Venkatesh et al. (2012), risks with regard to process compatibility results in reluctance to adopt IOS solutions. In particular the fact that processes are flexible poses challenges. With manual information exchange or when working in the system of a one party, organizations can independently customize processes. In contrast, with a dyadic or multilateral IOS, parties are interdependent causing that projects can only change in consultation with other parties.

Furthermore, it is easier for large parties to implement a multilateral IOS solution because of a high IT maturity as IT systems are better integrated compared to systems of smaller parties. Previous research has indicated that poorly integrated IS are aggravated by IOS (Grover 1993; Mäkipää 2006; Markus 2006; McGrath et al. 2001). Also in the case study the parties with poorly integrated systems are reluctant to adopt multilateral IOS. They prefer solutions that do not require large efforts to integrate existing systems, such as manual information exchange or making proprietary systems available for partners.

Moreover, McGrath et al. (2001) suggested that substantial development, processing and maintenance costs are the result of having many interfaces due to an increased number of systems. In the analyzed case, the number of potential interfaces is high because of the many systems that need to be coupled (see e.g. the dyadic IOS alternative). In particular the parties who not yet have existing interfaces between internal systems prefer providing external parties access to these internal systems. Because information that needs to be exchanged is stored in various systems, many (costly) system links must be built.

Choudhury (1997) suggested that having a large amount of parties would favor multilateral IOS. Our case seems to confirm that in the sense that the medium-sized party with limited amount of trading partners favored bilateral information sharing (electronic dyads). Parties with more partners favor multilateral IOS because having bilateral exchanges would become very complex. Network operators and contractors have similar goals: reducing lead times and minimize costs. The multilateral IOS alternative potentially offers both sides benefits by enhancing information exchange.

Conclusion

In our research the factors as found in the literature were confirmed. In addition we found that different organizations favor different arrangements and that the form of IOS mediates the factors influencing adoption. Firm size, availability of resources, power of actors, amount of transactions, process compatibility, IT maturity and the prospective number of interfaces are the IOS adoption factors that played a role in choosing which form of IOS has a party’s preference. Yet there is a difference in preference for information sharing arrangements. Large parties favor multilateral IOS (with an intermediary) solutions, whereas smaller parties favor either dyadic solutions, or do not want to address information sharing at the network level. Their choice seems to be primarily driven by the risk of losing control. Low IT maturity and limited availability of resources increase the adoption burden of IOS alternatives, making solutions that are closer to the existing IT landscape more attractive to smaller and medium sized parties. Furthermore, those parties have limited influence on steering the multilateral IOS even though their operations become highly dependent on it. Smaller parties favor dyadic IOS solutions for reasons of maintaining control over the linkages with their partners. We therefore conclude that the way the aforementioned factors affect IOS adoption is mediated by the form such IOS takes and that there is large difference between small and large parties in how this mediating factor affects the relationship.

As only a single case was examined, further research is needed into whether these findings also hold for other cases. We expect that similar situations are likely to yield similar results. Future research may, for example, examine similar IOS in other sectors and expand on the findings presented in this paper. A limitation of the present paper is that we focused on factors on the organizational level rather than the network level of analysis. On the network level of analysis, issues like the complexity of the network, the number of organizations involved and heterogeneity of the actors may also explain preferences of actors for information exchange configurations.

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