Inter-organizational Information Systems and Interaction in Public vs. Private Sector - Comparing Two Cases

Ulf Melin, Karin Axelsson

Inter-organizational Information Systems and Interaction in Public vs. Private Sector – Comparing two Cases

Ulf Melin[1], Karin Axelsson[1, 2]

[1] Department of Management and Engineering, Linköping University, SE-581 83 Linköping, Sweden
[2] Swedish Business School, Örebro University, SE-701 82 Örebro, Sweden
{karin.axelsson, ulf.melin}@liu.se

Abstract. This paper compares inter-organizational (IO) interaction and inter-organizational information systems (IOS) in public and private sector. The purpose of the paper is to explore differences and similarities between e-government and e-business focusing IOS and interaction. This is done in order to facilitate learning between the two fields. The point of departure is two case studies performed in private vs. public sectors. A comparative study is made using IO concepts from industrial markets that characterize an IO relationship (continuity, complexity, symmetry, and formality) and concepts that describe dimensions of such relationships (links, bonds, and ties). The results from the comparative study show that there are several similarities concerning interaction in relations between organizations in the two sectors. There are also differences depending on the level of analysis (empirical level vs. analytical level). The study shows the need to be explicit regarding organizational value, end-customer or client/citizen value and the type of objects that are exchanged in the interaction.

Keywords: B2B, G2G, interaction, e-government, inter-organizational, IOS.

1 Introduction

Inter-organizational (IO) aspects and processes are central in all organizational development regardless of sector, with or without information systems (IS) development in parallel. Inter-organizational information systems (IOS) have been identified as a key requirement for effective operation of IO relationships [5, 6] and have several impacts on governance, e.g. on a market level and an organizational level [21] and are therefore important to study when analyzing and developing IO interaction. IO aspects have been focused in organization theory, where interaction in dyads and networks are vital objects for research (cf. Håkansson and Snehota [16], who stated that no business is an island). This statement was later used in order to characterize governments in a network setting – *"no government is an island"* [19, p.

1420]. If we take a look at the private sector, business to business (B2B) interaction is an area of increasing interest when discussing electronic commerce, Internet and ERP.

IO relations are also central when analyzing and developing government to government (G2G) interaction in order to achieve, e.g., useful one-stop government arrangements [11, 24]. Schedler et al. [22] claims that there are three central statements that constitute the key to a comprehensive understanding of electronic government: 1) e-government uses IT, especially the Internet, 2) e-government deals with organizational aspects of public administration; and 3) e-government considers the interaction of public administration with its environment (e.g. customers, suppliers, citizens, politicians).

IO interaction is the main theme addressed in this paper. A comparative study of two cases will be presented based on the following main research question: In what ways is private and public IO interaction similar and how does it differ depending on the sector context? The understanding of similarities and differences is useful as a point of departure when learning between private and public sector should take place. The need of comparative studies of e-business and e-government is put forth by Barzilai-Nahon and Scholl [3], who argue that such comparative efforts are necessary but still rare. This paper is a response to the shortage of research focusing comparative (inter sector) studies. This paper contains a comparative case study from the private and the public sectors. The private sector is represented by a business B2B relation between a carpentry and a sawmill – both small and medium size companies (SMEs) located in Sweden. The public sector is represented by a G2G relation between two agencies, one organization is Sweden's County Administrations (SCoA) and the other one is the Swedish Road Administration (SRoA).

When a new research field, like e-government, is entered or in a phase of rapid growth there is a clear tendency that "wheels are reinvented". Researchers as well as practitioners in the field tend to identify "too many" unique characteristics or unique factors related to the studied phenomenon, without learning from history and previous studies. On the other hand, there is another more or less opposite tendency; to take things for granted and, not critical enough, import or export ideas, concepts and lines of thinking from one area, sector or field to another. We believe that the IS field, dealing with e-government and e-business, is no exception in this case. Therefore we argue that it is important to conduct comparative case studies from different sectors.

The purpose of the paper, based on the research question introduced above, is to explore differences and similarities between e-government and e-business focusing IOS and interaction. This is done in order to facilitate learning between the two fields. Our analysis will be made based on the IO concepts from industrial markets [16, 17]. Theoretical concepts that characterize an IO relationship (continuity, complexity, symmetry, and formality) and concepts that describe dimensions of such relationships (links, bonds, and ties) will help us to describe and analyze interaction. The approach and the concepts are presented below. We have applied these theoretical concepts to the e-government field in a previous study in order to discuss challenges in one-stop government [2]. In that study the IO concepts from industrial markets were refined and structured into a conceptual framework of IO agency relationship dimensions (ibid.). We will use this conceptual framework in order to structure our comparative case study analysis.

After this introduction, the paper is organized in the following way: In Section Two we describe the research design, followed by the introduction of the case studies. The theoretical background to IO interaction and its relation to the comparison of IO interaction in e-business and e-government, and IOS are then presented in section Three. The empirical findings from the two cases are analyzed and compared, using concepts from the introduced interaction approach in Section Four. The paper is concluded in Section Five, together with statements about further research.

2 Research Design and Case Study Introduction

The overall research design in this paper is qualitative and interpretive [26] and based on case studies. The fieldwork that we have conducted has been close to the cases and the actors within. Based on this we had a good access to interviewees, written sources, meetings, etc. The interviews had a semi-structured and semi-standardized design and were recorded. The interviewees have been selected in order to reach a broad view of apprehensions. We have asked open questions about how they understand the notion of e.g. IO interaction, IOS, communication, etc.

The empirical data has been analyzed in a qualitative, interpretive way, using theory as a lens (central IO concepts from industrial markets [16, 17]) when analyzing. This is in line with a strategy using theory as a "part of an iterative process of data collection and analysis" [26, p. 76]. Besides using the concepts as a part of analysis, we tried to be open minded, investigating aspects and discoveries outside and beyond the theoretical concepts applied. The cases included in this paper represent organizations from the public and the private sectors that have performed extensive work with IO dimensions (IO interaction, IOS, etc.). This makes them interesting to analyze and to compare. The cases have, of course, differences in terms of size, complexity, sector, management, type of IT systems, etc. and should not be interpreted as representing a statistical sample. This is however an asset concerning the variation, and the ambition to maximize the variation. When doing this it is of course limitations involved concerning the comparative analysis; all aspects of the cases are not possible or even interesting to compare.

Introducing the E-government Case Study. The G2G case is focused on driving license issues. We have studied the IO interaction between two government agencies (CoA and SRoA) during the issuing of provisional driving licenses. The overall process and background to this case is that everyone in Sweden who want to get a driving license, first have to apply for a provisional driving license from the regional CoA. The provisional driving license is approved if the applicant is judged by the regional CoA to be able to drive a vehicle in a safe way. The permit application was, until an e-service was implemented, a paper form that was filled in, signed and sent by mail to the regional agency. The application had to be complemented with a health declaration, a certificate of good eyesight, and maybe also an application that, e.g., a parent will be allowed to act as a private instructor. These documents were received and reviewed by a case officer at the agency. The case officer also checked if the applicant had been punished for any crimes. This information was registered in a database, operated by the police, which the case officer had access to through an IOS.

When the provisional driving license had been granted, the CoA reported this to SRoA through this IOS. When the applicant has completed a driving test and a theoretical test successfully, she/he receives a driving license from the SRoA.

We have studied the development project that aimed at developing an e-service for handling the provisional driving license applications. The e-service was intended to make an automated decision in "green cases" (i.e., cases that do not call for extensive handling) and support case officers handling such cases. By achieving this, the agency will in the long run try to save and reallocate resources from handling "green cases" to more complex errands. An e-service like this also provided an opportunity to standardize the application handling across the nation and the 21 county administration boards.

The E-government Case Study Research Design. The empirical data generated in this case has mainly been generated through semi-structured interviews with significant actors within the development project. We have in the beginning of the development project interviewed six persons involved in the project. The interviewees had the following roles: an IT strategist, a development project manager, a system manager, an internal investigator, a case officer and an IT development manager. We have then interviewed seven persons when evaluating progress and results in the end of the development project. Five of these interviewees were within the public sector; four of them were case officers and one of them was a local project manager at a CoA. Two interviewees were external consultants who worked for the public sector related to the studied e-government initiative. One of the consultants was a project manager supporter and the other person was an e-government development manager.

Introducing the B2B Case Study. The B2B case consists of the relation between two private owned firms in the wood industry; a sawmill and a carpentry. The studied sawmill is a family-owned company, established in the early 1900s. The business employs approx. 30 people. The sawmill exists in a volatile and competitive market, where raw materials are scarce and prices increasing. Securing the supply of raw material or logs is in focus. The carpentry manufactures a central component for houses; the stairs. The first product was manufactured already in the 1930s and since then production has continued in various forms of organization. 30 people are employed in the organization today including five administrators and the two joint owners. Since a couple of years, the firm enjoys very good profitability. The carpentry's business concept has remained the same since the beginning. The firm manufactures their product piece by piece, each product being unique.

The B2B Case Study Research Design. The two studied firms are a part of an industrial network that we have studied in a longitudinal multiple case study. The most significant unit of analysis was the firms and their business relations. Altogether 21 people in different positions were interviewed in the two focused firms, generating empirical data that is used in this study. Roles covered are e.g. owners, managing directors, administrators, controllers, production managers and mechanics/carpenters. Besides the empirical interview data we have also studied documents (e.g. firms' business strategies), artifacts (e.g. products, production layouts, logistic and IS) and made observations as empirical means for rich data.

3 Theoretical Background

This section of the paper presents core concepts from the so called Uppsala School – "the industrial/business network approach" (IMP [International/Industrial Marketing and Purchasing] approach) and notions of how IO interaction can be compared in e-business and e-government settings.

3.1 The Business Network Approach

The IMP approach [1, 15, 17], is a mature line of thinking that supports the understanding of interaction in business networks. Interaction is an aspect of reciprocal action or interplay; it is not the case of one organization *acting* and the other organization *reacting* [17]. This is an important standpoint in the network approach. If we take a closer look at the interaction between organizations we can find several characteristics of relationships. (1) *Continuity* refers to the relative stability that tends to characterize supplier and customer relationships. (2) The *complexity* in a relationship can among other things comprise the number, type and contact channels for those from each organization who are involved in relations between customer and supplier. Also, contacts can vary from level to level between organizations. It is typical for relations in industrial networks for customers and suppliers to be *symmetrical* (3) in terms of resources and initiatives on each side. In those cases where asymmetry does occur, the customer tends to be bigger than the supplier is. The relationships often demonstrate a *low level of formality* (4). Even though contracts exist, they are seldom referred to, as it is often pointed out that contracts are an ineffective way of dealing with uncertainty, conflict or crises in relationships which are going to survive for some time. [17]

Another important aspect to study, when looking at interaction between organizations, is different dimensions of relations, such as *links*, *bonds* and *ties*. The various links, bonds and ties between organizations in an organizational network are important to consider when studying relationships [1, 17]. The word *link* refers to the connections that exist in the activities between organizations, so-called activity links. An activity is defined as: "a sequence of acts directed towards a purpose" [17, p. 52]. Activities can be of various types, for example technical, administrative or commercial. The links between activities reflect the need for co-ordination which affects how and when various activities are carried out. Matching one actor's resources with others' and dividing out the tasks are examples of an aim towards purchasing and marketing functions within an organization. This, in turn, has consequences for both the costs for carrying out the activities and their effectiveness [17]. The links between activities make up a certain structure within the respect of organization at the same time as it also creates certain patterns in the network.

Bonds between the actors in a network can be of various types, for example technical, social, time- based, knowledge-based, administrative, economic or legal [17]. Bonds arise in relationships as two related actors mutually acquire meaning in their reciprocal acts and interpretation [17, p. 197]. Bonds can have various aims, an example being to achieve co-ordination as a means of saving resources. To gain access to suitable co-operators and maintain a certain position in the network are other

examples of the importance of handling bonds. “Actors act and develop bonds; at the same time they are a product of their bonds” [17, p. 201].

An IO relationship affects the way in which the organizations use their personnel, equipment, know-how, and financial resources, only to mention a few. A relationship between two organizations can comprise pooled resources of these kinds, so-called resource *ties*. The relationships between organizations are not just a way of assuring access to resources, they are also a way of getting various types of resources to meet, confront and combine [17], and to develop, create or refine.

We can identify several motives for applying these theoretical concepts when analyzing and comparing our two cases. The B2B case is obviously an illustration of an industrial network. The G2G case does also possess characteristics of IO interaction. The Swedish model for public administration implies that cooperation between agencies in Sweden relies on similar foundations as cooperation between private organizations, i.e., there is a large amount of semi-autonomous agencies that have to find ways to cooperate and coordinate their joint development projects. Thus, we propose that IO relationships between agencies have some characteristics in common with business relationships in other networks. Another reason is that cooperation in the public sector sometimes involves financial exchange, which makes cooperation similar to cooperation in a business network. This implies that the network approach would be able to extend to the public sector.

3.2 Comparing IO Interaction in E-business and E-government

Historically, IS research has been argued to be less successful in developing cumulative research [4]. For most phenomena being studied, a new theoretical frame has been put forward instead of careful analysis of already existing frames. Strong theoretical frames with real value are, thus, rare [17]. This is something Heeks and Bailur [12] also emphasize as weak or confused positivism in e-government research dominated by over-optimistic and a-theoretical work, which do not add much practical guidance to e-government. Our ambition in this paper is to adopt core concepts from the mature IMP approach on the B2B and G2G cases in this paper. It is, thus, an attempt to apply and analyze an already existing theoretical frame instead of inventing a new one.

There are few research studies focusing on comparison between e-business and e-government issues [23]. Instead, these two fields are either seen as *closely related* (if focusing on IT aspects) or *totally different* (if focusing on funding mechanisms, some governance aspects and other organizational drivers). Both these standpoints might be harmful since they imply that knowledge either can be transferred between the fields in an uncritical way or that no lessons can be learned based on comparisons. In this paper we assume that increased understanding of how B2B and G2G interaction are alike and different can help improving both fields. This assumption is confirmed by Barzilai-Nahon and Scholl [3] who argue that both the private and the public sector would benefit from a better understanding of similarities and differences regarding e-business and e-government. They present a study that identifies several areas of similarities between e-business and e-government; i.e., process improvements, back-end integration, cost savings, information sharing, vertical and organizational e-

systems integration, increased responsiveness and service quality, standardization efforts, and the criticality of senior leadership support. They distinguish some areas of differences as well; i.e., the drivers and motivations for e-business and e-government, stakeholder expectations, and resource availability (ibid.). All in all, Barzilai-Nahon's and Scholl's [3] findings show that there seem to be many aspects where we can find similarities, but we also need to understand the differences in order to avoid exaggerated knowledge reuse. Their study does, however, not focus on IO interaction in any detail, which implies that our study fills a gap in this respect. Several e-government scholars emphasize that the e-government field has disregarded IO aspects even though these seem to be a major cause for many problems [20, 25]. This supports our objective to explore how knowledge can be transferred between B2B and G2G fields.

3.3 Inter-organizational Information Systems

IOS are information systems that in some sense cross organizational boundaries and are shared by two or more organizations [21]; i.e. support B2B, G2B or G2G interaction. There are several studies covering IOS development and use. Early and seminal studies are performed by different scholars [13, 18, 28]. These and other early studies have been used as point of departure for many following studies of IOS. Kumar's and van Dissel's theory [18] has e.g. been expanded by Fahy et al. [7]. Roles of the organizations cooperating via an IOS are the basis for another framework proposed by Hong [14]. There are also studies of theoretical foundations of IOS [21].

IOS exists in a dialectic relation with business processes and the structure of organization or relationship between organizations. A higher level of structure and formalization can be a result when using IOS in IO interaction [18]. Formalization exists e.g. when there are tightly coupled IOS that require extensive relationship specific investments [9]. Tightly coupled IOS are associated with reduced flexibility [10]. EDI was an early example of this. Internet and extranet solutions on the other hand have made data interchange, interaction and communication easier to perform cross organizations. Enterprise systems are shifting from internal to external focus and IO operations are increasingly important to handle [6]. However, such solutions will require integration with internal IS in order to work efficiently [6, 29].

4 Analysis

In Table 1, below, the overall relationship characteristics will be analyzed in the cases from the two sectors using core concepts from the IMP approach [1, 15, 17] presented earlier in the paper. First we will analyze the overall relationship characteristics (continuity, complexity, symmetry and level of formality) followed by the relationship dimensions (links, bonds and ties). The analysis is structured according to a conceptual framework of IO agency relationship dimensions [2]. IOS is not explicitly highlighted in the central concepts that we have applied based on theory. In

the concluding section we will use complementary theory, besides the IMP approach, in order to discuss the IOS dimension of B2B and G2G interaction.

Table 1. Relationship and interaction analysis – a comparative study of B2B and G2G cases.

Relationship Dimensions	Relationship Categories	Business (B2B) Case	E-government (G2G) Case
Overall Relationship Characteris-tics	Continuity	Stable and mature (long term) relationship. The sawmill experiences a certain responsibility as a major supplier of wood to the carpentry.	Stable and mature relationship, which seems to be less challenging than the opposite. The relationship and the division of labor is regulated in law.
	Complexity	There is a low level of complexity in the relation. The communication process and the overall exchange process are uncomplicated and straight forward. A small number of actors have contact with each other between the organizations.	The relationship consists of many agency actors and many citizens' applications. There are diverse conceptions about the components of the complexity but the overall complexity is regarded as high.
	Symmetry	The carpentry has a clear initiative in the relationship and the relation is in that sense asymmetrical. The sawmill has a strategy to adjust to (changing) customer demands and initiatives.	Goal conflicts between several overarching roles, responsibilities and missions exist between the agencies. The SRoA is the dominating part in the relationship in terms of resources, knowledge (concerning e.g. e-services, project management, IT). SCoA is more diversified and divided. The relation is considered as asymmetrical.
	Level of formality	Low level of formality. There are variations in the corporate culture, history, etc., but the companies have a lot in common (the regional relation, the SME character, activity in the wood industry, etc.).	A high level of formality concerning the division of labor exists between the parties regulated by the government. This certainly has an influence on the relationship. Differing apprehensions about division of labor and responsibility occur. Variation in project management approaches/cultures also exists.
Links	Technical	Not an "advanced" IOS. The sawmill has created a view in their stock IT system so that they can expose the products that are unique for the carpentry. These products are also put into a special destined physical space in the factory building.	The SRoA supplies the IOS (the Road Traffic Register [RTR]) that the 21 CoAs use as an important tool for handling the applications. Data from the traffic register is used n the new e-service for handling applications; i.e. systems integration exists.
	Administrative	Rather simple and individual patterns of communication and cooperation. Disintegrated processes within the firms, but (individually) integrated between firms.	Disintegrated process with many contacts and deliveries between agencies. The agencies have responsibilities for different phases in the process of handling provisional driving licenses. Complicated patterns of communication and cooperation exist.
	Activity	Sequential interdependencies between activities in the two companies (e.g., in order and delivery processes). The sawmill, to a large extent, adapt their activities to this customer's needs. Information and goods exchange.	One aspect of activity links identified in this relation is the level of adaptation to the other party. The SCoA has to adapt to the IT system supplied by the SRoA; but has some possibilities expressing requirements on design of the IT system and the use of the system. Information and service exchange.
	Commercial	The sawmill has invested in a dedicated production equipment in order to satisfy demands from this important and demanding customer.	Not applicable in this case.
Bonds	Actor	Flat, non-hierarchical organizations, with few organizational levels. Actor bonds rely more on a personal (social) dimension between the firms, built up from the long-term relationship.	A gap between participants in working groups on different hierarchical levels (so called action groups; one at the operative level and one at the strategic level) within and between agencies. History influences opinions about present and future division of labor between agencies often criticized and discussed. Implicit actor bonds.
	Economic	The sawmill depends a lot on the demand from the carpentry (in production volume and economic terms). The ROI is higher at the carpentry than at the sawmill.	Complex principles for compensation related to the performance of activities; some tasks are resource demanding but uncompensated.
	Legal	Written frame contracts occur, but are seldom referred to. Legal bonds are implicit in the relation and in the interaction between actors from the two firms. Bonds are instead created based on mutual trust and a long-term business relation.	The agencies have several external assignments and both superior and inferior roles towards each other. The SCoA has an explicit mission from the government to develop e-services. The SRoA has the overall responsibility for the national road traffic issues sanctioned by the government. This fact also influences the bonds between the parties and the asymmetry (above) in the relation.
Ties	Resource	A number of pooled resources are jointly connected to the product (the customized wood material) and the production. Know-how is also transferred from the carpentry to the sawmill in order to increase the level of refinement in the product.	The studied parties pool resources (personnel and know-how) in order to develop e-services in a joint development project. At the same time there are an asymmetry in incentives for the joint project influences and the amount of resources spent on the project, e.g., due to the fact that the SRoA has an in-house IT development staff and the SCoA lacks this in-house competence. Knowledge is both a resource used in the project and an outcome from the project; i.e. competence development on individual and organizational level.

5 Conclusions and Further Research

In the introduction of this paper we asked in what ways private and public IO interaction is similar and how it differs. The ambition has been to understand similarities and differences in order to explore when and how the e-business and e-government fields can learn from each other regarding IO interaction. The contributions of our study are both presented as identified similarities and differences in the studied cases and as suggested, explorative, refinements of the conceptual framework used for analytical comparisons of B2B and G2G interaction.

Differences. Our conclusions, based on using the IMP approach [1, 15, 16, 17], show that there are differences between the interaction in the studied cases from the two sectors. If we take a look at the overall relationship characteristics there are differences, at the empirical case level, but the categories that support the analysis work in an appropriate way. Important factors framing the interaction and the relations are, e.g., present in the G2G case where we have the Government that regulates e.g. the present processes, actors, division of labor. In the B2B case we also have laws and regulations, but on another level (e.g., concerning accounting, different types of permits, etc.). From the empirical data we have also identified differences in the level of formality, asymmetry, technical (e.g., the use of an IOS), organizational structure (actor bonds), economic bonds and administrative links (in Table 1). Legal and actor bonds (content) also differ between the cases.

Links, bonds and ties are also possible to use when comparing interaction between organizations in different sectors. The difference in the use of the link category "commercial" between the two sectors made us aware of the need to discuss and analyze the "value" category as an alternative. One can also discuss which role the size of the studied organizations has had when comparing the empirical data. The size of the organizations has some effects on how they organize processes and hierarchy levels. But in the same time the size and structure of the private vs. public sector are given by the market and the overall structure of the public sector on a national level.

Barzilai-Nahon and Scholl [3] distinguish some areas of differences between B2B and G2G sectors; i.e., the drivers and motivations for e-business and e-government, stakeholder expectations, and resource availability [cf. 8]. All in all findings [3] show that there are many aspects where we can find similarities, but we also need to understand the differences in order to avoid improper knowledge reuse.

Similarities. Our conclusions based on using core concepts from the IMP approach [1, 15, 16, 17] show that there are similarities between the cases from the two sectors both at an empirical level and at an analytical level (the used categories). For example, both relations are stable and mature (continuity), have disintegrated processes (administrative link), sequential interdependencies (activity link) and pooled resources (resource link) (see Table 1).Earlier in this paper we assumed that increased understanding of how B2B and G2G interaction are alike and different can help improving both fields. We argue that we now have showed that this is the case, in line with [3]. However, we need to separate the *analytical level* from the *empirical level*. Our study shows that we can use the same set of categories when we analyze B2B and G2G relations and the present interaction. The result of using the same set of categories, however, can differ due to what type of organizations (firms or

government agencies) that are analyzed, based on contextual factors. We can conclude that our study also shows that there are several areas of similarities between e-business and e-government, as identified above. There is a reported need to continuously improve intra- and IO processes, back-end vs. front-end integration, cost savings (efficiency), vast communication and information sharing, the need for IT integration, increased responsiveness and service quality, standardization efforts, and the criticality of senior leadership support [3]. The last aspect, however, more implicit in the rather non hierarchical SME's in our empirical data. The reported study [3] does, however, not focus on IO interaction, which implies that our study adds value.

Mutual Learning in B2B (e-business) and G2G (e-government). After having analyzed the interaction in our B2B and G2G cases using the IMP approach, we argue that the use of the relationship characteristics and the relationship dimensions are useful when structuring, describing and analyzing interactions – regardless of focused sector. However, we believe that there are aspects that can be made more explicit. There are also indications that a mutual learning in the two fields can occur when taking its differences and similarities into account [cf. 3]. Based on the comparative analysis we also suggest that the conceptual framework of IO agency relationship dimensions [2] can be further developed. Organizational size, culture and value can be made more explicit as well as the aim to create value for an end-customer (end-client or citizen). We also identified a need to be explicit regarding the exchange object (services, products, information, etc.). If the interaction in is supported by an IOS as an example of a technical, administrative and activity link these aspects are also important in order to create organizational and end-customer or client/citizen value. Such applications can be viewed as back-office systems, but has an effect on what joint value organizations can create. In order to compensate for the weak focus on IT (IOS), will we comment upon that in the following section.

IO Interaction and IOS. In the B2B case, a "non-advanced" IOS was used; the sawmill has created a view in their stock IT system so customer unique products can exposed (a technical link in Table 1). This improves and simplifies the interaction between the two firms, without being expensive and resource demanding as an investment [5, 6]. This type of application is tied to this particular key customer, using a remote login solution, but can, hypothetical be used for several customers. It is not technological issues that limit the IOS; it is more a question of trust. Trust based on a stable and mature (long-term) relationship between the two parties. The IOS is tightly coupled, but we would not argue that it has required extensive relationship specific investments [cf. 9]; at least not in direct IT investment terms – rather in mutual trust.

In the e-government case we have studied a development project that aimed at developing an e-service for handling the provisional driving license applications. The e-service was intended to make an automated decision in "green cases". This system has IO parts and is integrated with systems at several other government agencies in order to exchange data concerning e.g. crime records, residential information, etc. Links to the RTR are important in the daily work handling applications for provisional driving licenses. The IOS improves and simplifies the interaction (even if it is mainly unidirectional) between the studied agencies [cf. 5, 6]. The IOS is tightly coupled, and has required extensive relationship specific investments [cf. 5]. The dependency that the technical link represents will probably decrease flexibility [10].

Further Research. Further research is needed in order to compare different types of organizations in the two sectors. Further research is also needed covering G2B and B2G relations. The sample of organizations, and the relations, can be enlarged and chosen based on differences in business type, industries, local government, state, size, types of services, etc. This would add further understanding of the possibilities to achieve mutual learning about IO interaction in B2B and G2G. Choosing the cases that are present and analyzed in this paper is a limitation, as we pointed out above, but the variation represented here is also an opportunity. Based on the comparative study, we have identified that even if an organization is a part of a particular sector the organizations in a certain sector are not homogeneous. The character of the organization can be made more explicit when analyzing its relations. Our comparison indicates that the identified characteristics that can be made more precise compared to the presented relationship characteristics and dimensions (links, bonds and ties) [15, 17] as well as the conceptual framework of IOS agency relationship dimensions [2]. The identified characteristics concerns: organizational size, value and culture, the exchange object (services, products, information), service level, end-citizen/customer value, and the use of IT or e-services (IOS) as an example of a technical, administrative and activity link. These indications can be related to the existing body of knowledge and analyzed more in detail. However, this is out of the scope of this study and an issue for further research. Another interesting area for further research is how to deal with public-private partnerships (PPPs). Studying PPPs could challenge the categories above further. In such cases, where private and public sectors meet, the kind of results that we report on appears to be valuable. To learn more about IO interaction between a private and a public organization would be beneficial for understanding both sectors. The issue of trust is an important part of the IMP approach [15, 17], but can also be highlighted using research focused on trust as such.

References

1. Axelsson, B. and Easton, G. (1992, Eds.). Industrial Networks: A New View of Reality. Routledge, London.
2. Axelsson, K., Melin, U. An inter-organisational perspective on challenges in one-stop government, Int. Journal of Electronic Governance, 1(3), 296-314 (2008)
3. Barzilai-Nahon, K., Scholl, H.J. Similarities and Differences of E-Commerce and e-Government: Insights from a Pilot Study. Proc. of the 40th Annual Hawaii Int. Conference on System Sciences (HICSS'07), 92-101 (2007)
4. Benbasat, I., Zmud, R.W. Empirical Research in Information Systems: The Practice of Relevance. MIS Quarterly, 23(1), 3-16 (1999)
5. Breu, K., Hemingway, C., Strathern, M., Bridger, D. Workforce agility: the new employee strategy for the knowledge economy. Journal of Information Technology 17, 21-31 (2002)
6. Daniel. E.M., White, A. The Future of Inter-organisational System Linkages: Findings of an Int. Delphi Study. European Journal of Information Systems, 14(2), 188-203 (2005)
7. Fahy, M., Feller, J., Finnegan, P., Murphy, C. Complexity and Context: Emerging Forms of Collaborative Inter-Organizational Systems. Journal of Information Technology Theory and Application, 8(4), 1-12 (2007)
8. Flak, L.S., Rose, J. Stakeholder Governance: Adapting Stakeholder Theory to e-government. Communications of the AIS (16), 642-664 (2005)

9. Goethals, F, Vanderbulcke, J., Lemahieu, W., Snoeck, M., Cumps, B. Two basic types of business-to-business integration. Int. Journal of E-Business Research, 1(1), 1-15 (2005)
10. Goodhue, D.L., Wybo, M.D., Kirsch, L.J. The Impact of Data Integration on the Costs and Benefits of Information Systems, MIS Quarterly, 16(3), 293-311 (1992)
11. Gouscos, D., Kalikakis, M., Legal, M., Papadopoulou, S. A general model of performance and quality for one-stop e-government service offerings. Government Information Quarterly, 24(4), pp. 860-885 (2007)
12. Heeks, R., Bailur, S. Analyzing e-government research: Perspectives, philosophies, theories, methods, and practice. Government Information Quarterly, 24(2), 243-265 (2007)
13. Holland, C.P. Cooperative Supply Chain Management: The Impact of Interorganizational Information Systems. Journal of Strategic Information Systems, 4(2), pp. 117-133 (1995)
14. Hong, I.B. A new framework for interorganizational systems based on the linkage of participants' roles. Information and Management, 39(4), pp. 261-270 (2002)
15. Håkansson, H. (Ed.). Int. Marketing and Purchasing of Industrial Goods – An Interaction Approach. IMP Project Group, John Wiley & Sons, Chichester (1982)
16. Håkansson, H., Snehota, I. No business is an island: The network concept of business strategy. Scandinavian Journal of Management, 5(3), pp. 187-200 (1989)
17. Håkansson, H., Snehota, I. (Eds.). Developing relationships in business networks. Thomson, London (1995)
18. Kumar, K., H.G. van Dissel Sustainable Collaboration: Managing Conflict and Cooperation in Interorganizational Systems. MIS Quarterly, 20(3), 279-296 (1996)
19. Persson, A., Axelsson, K., Melin, U. e-Government challenges – Exploring inter-organisational aspects of e-service development, In: Ljungberg, J., Andersson, M. (Eds.) Proc. of the 14th European Conference on Information Systems, pp. 1419-1430 (2006)
20. Punia, D.K., Saxena, K.B.C. Managing inter-organisatinal workflows in e-government.In: Janssen, M., Sol, H.G., Wagenaar, R.W. (Eds.) Proc. of the 6th Int. Conference on Electronic Commerce (ICEC), 24–26 October, Delft, 500-505 (2004)
21. Robey, D., Im, G., Wareham, J.D. Theoretical Foundations of Empirical Research on Interorganizational Systems: Assessing Past Contributions and Guiding Future Directions, Journal of the AIS, 9(9), 497-518 (2008)
22. Schedler, K., Summermatter, L. Customer orientation in electronic government: Motives and effects, Government Information Quarterly, 24, 291-311 (2007)
23. Scholl, H. J. What can e-Commerce and e-Government learn from each other? In: Proc. of the 2006 Int. Conference on Digital Government Research (San Diego, Calif., May 21 - 24, 2006). dg.o '06, vol. 151. ACM, New York, NY, 454-455, (2006)
24. Tambouris E., Wimmer, M.A. Online one-stop government: a single point of access to public. In: Huang, W. (Ed.) Digital Government: Strategies and Implementations in Developed and Developing Countries, Idea Publ., 115-144 (2004)
25. Tranmüller, R., Wimmer, M.A. E-government at a decisive moment: sketching a roadmap to excellence. In: Tranmüller, R. (Ed.) EGOV 2003, LNCS 2739, Springer, Berlin, 1-14 (2003)
26. Walsham, G. Interpretive case studies in IS research: nature and method. European Journal of Information Systems, 4(2), 74-81 (1995)
27. Walsham, G. Doing Interpretive Research. European Journal of Information Systems, 15(3), 320-330 (2006)
28. Webster, J. Networks of Collaboration or Conflict? Electronic Data Interchange and Power in the Supply Chain, Journal of Strategic Information Systems, August, 31-42 (1995)
29. Yang, J., Papazoglou, M. Interoperation support for electronic business, Communications of the ACM 43(6), 39-49 (2000)