Inter-Organizational Strategic Information Systems Planning (IOSISP) in Network Perspective: How Network Governance Influences IOSISP Effectiveness

Evaluation of Healthcare, Government and Logistic/Transport Industry Sectors in the Netherlands

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ABSTRACT

Many researches have been done in Strategic Information Systems Planning (SISP). Nowadays, the concerns of SISP have evolved not only in a single organization, but broader into network area, when more than one organization collaborate and formalize a network, where Inter-Organizational Information Systems Planning (IOSISP) emerges. The major challenge is then coordinating the collaboration between those organizations in effective ways. This is where network takes important part in the successfulness of Information System (IS) planning process.

There are extensive network theories with regard to the accession of network effectiveness, from social networks to organizational networks. This thesis studied IOSISP in network perspective; we did literature researches on network theories and IOSISP, and propose a conceptual model for an effective IOSISP by adopting network governance theory.

The main objective was to see that the knowledge of network governance could lead to an effective IOSISP and prevent from unwanted implementation issues in the inter-organizational context.

The proposed conceptual model is validated through an evaluation of multi-case studies within three industry sectors in the Netherlands (health care, government and logistic/transport sectors). We argue that the performance or effectiveness of IOSISP implementation in those three industry sectors would be impacted by how networks are governed or structured and managed.

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1. INTRODUCTION

1.1. Problem Statement

Nowadays, many organizations decide to work and plan to use their IT together, leading to what is called Inter-Organizational Information Systems (IOS). The major challenge of IOS implementation is coordinating those organizations in effective ways. This is where network takes important place in the process and effectiveness of Strategic Information System Planning (SISP).

An example of IOS implementation presents some issues in the Logistics Hub system for a transport supply chain directed by Vos Logistics (van Hillegersberg et al., 2003). They encounter some problems such as trust was narrowly distributed among participants and there were no open calculations and cost distributions. They mention in their conclusion: "In the end, it is the willingness of parties to collaborate, change their current ways of working and trust a new method of working before this can lead to success and a chain-wide adoption". Another example is described in the VETUMA project (van den Broek, 2008) conducted in Helsinki's metropolitan area, building an online identification and payment infrastructure. The planning phase is expected to be done in one year, but it is lasted for more than years. The research's report concludes that: "The duration and delay in the VETUMA project is mainly caused by the configuration of the network and external forces: it is started with two municipalities and grew finally to over 60 organizations in the implementation phase." Another conclusion is: "The case shows that existing relations between stakeholders increase the relational certainty, in other words trust, and therefore has a positive effect on the participation, which gets more flexible, and improves the learning effect and in that senses the networked SISP effectiveness".

From the previous projects described above, the structural properties of the network and the network governance mechanism (e.g. relations between stakeholders, trusts) seem to be important aspects in Inter-Organizational Strategic Information System Planning (IOSISP) context. A study from Kumar & Crook (1999) presents three management perspectives of managing IOS: collaboration issues such as trust and power, organizational issues such as size of organizations, leadership and user involvement, and technology issues such as the nature of IOS management. A research from Salmela & Spil (2006) also predicts that the SISP approaches will vary depending on the network governance style.

There are extensive literatures on network theories, from social networks to organizational networks, such as Actor Network Theory (Law 1999), Social Network Analysis (Wasserman 1994), Strong and Weak Ties (Granovetter 1973), Whole Networks (Provan, Fish & Sydow, 2007), Network Governance (Provan & Kenis, 2007), Network Management (Kickert et al, 1997), etc.

The idea of the differentiation of network governance by Provan & Kennis (2007) that relates to the structural properties (centralized/decentralized) focuses on the management of inter-organizational networks at the network-level of analysis. Network governance mechanism is further presented through the contingency conditions including the size, density, trust and consensus among organizations that would affect the structural properties of the network.

The work of Provan & Kenis (2007) has been studied by some researchers. A dissertation from Salmivalli (2008) aims to contribute in the health care information systems research by studying the implementation process of Electronic Prescription System (EPS) in Finland from the IOS research and network perspective. This dissertation adopts network effectiveness concept developed by Provan & Milward (2001) and network governance forms proposed by Provan & Kenis (2007). In summary, he

concludes that “network perspective of complex health care IS project needs further study and critical evaluation for excellent presentation of inter-organizational collaboration, and such complex network settings need more effective steering methods to be successful”. Moynihan (2009) studies how a highly centralized mode of network governance operates in an application of a structural innovation known as Incident Command Systems (ICS) in United States. He refers to network governance forms, tensions and evolution described by Provan & Kenis (2007) to explain NAO governance form and its tensions in the ICS network. Another work from Provan et al. (2009) in relation with their previous work (Provan & Kenis, 2007) explains about the longitudinal evolution of structural embeddedness and organizational social outcomes; organizational trustworthiness, reputation and influence, in a governed health and human services network in which it also describes shifting of network governance form.

This research aims to provide brief findings in the relation between network governance and IOSISP. Our intention is to build a conceptual model from the result of literature review on network governance theory, IOSISP and its effectiveness, and use multi-case studies (Yin, 2003) to validate the model. We relate network governance theory (Provan & Kennis, 2007) with IOSISP and draw conclusion on how network governance affects IOSISP effectiveness. However, the idea of Provan & Kenis (2007) focuses on general network governance level, whereas in our research, similar with what is mentioned in the work of Salmivalli (2008) in relation with his research, we focus on particular IOS network governance cases in three industry sectors (health care, government and logistic/transport).

The differences of our research compared with prior researches that are also based on Provan & Kenis (2007) are; first, our research tries to use all of the three propositions of network governance proposed by Provan & Kenis (2007), which are network governance forms and its contexts, network tensions and network evolution. Next, our research combines this network governance theory with IOSISP context and its effectiveness. Moreover, while previous researches mostly use only one type of industry sector as their case study, this research uses three specific industry sectors that are expected to represent the three different types of network governance.

1.2. Research Questions

The main goal of our research is to increase the knowledge on the effect of network governance in IOSISP process and effectiveness in several of industry sectors. To be able to meet this goal, we formulate a knowledge problem as a main research question, which is stated:

How does network governance affect IOSISP effectiveness in healthcare, government and logistic/transport industry sectors?

The main research question is then divided in researchable components, so that it can be answered more easily. These sub questions are:

Q1. *What are the current approaches to evaluating network and IOSISP effectiveness?*

- What is IOSISP?
- What is network governance?
- What network governance aspects are characteristics to the health care, government and logistic/transport sector?

- What is network effectiveness?
- How can we measure it?
- What is IOSISP effectiveness?
- How can we measure it?

Q2. *How to develop an improved model for understanding the linkages between network governance and IOSISP effectiveness?*

- What relationships exist between network governance and its effectiveness with IOSISP effectiveness?
- How can we position the finding in the current IOSISP context?

Q3. *How to ensure the suitability of the proposed model?*

- Could the model be used in practice in different industry sectors (health care, government and logistic/transport sectors)?

In general, our main intention is to see that knowing the kind of governance form in the network, how to manage them based on its contingency conditions and tensions, and the awareness of network evolution, will lead to an effective IOSISP and prevent from unwanted implementation issues in the inter-organizational context. We expect the performance or effectiveness of IOSISP implementation in those industry sectors to be impacted by how networks are governed or structured and managed.

1.3. Research Method

We conduct literature review on the network governance theory, IOSISP, and its effectiveness. We then build a conceptual model based on the result of this literature review and validate the model using semi-structured interview in multi-case studies (Yin, 2003).

The case studies are chosen among best practices networks (from the point of view of network survival) that utilize or aim for the use of Information Technology (IT)-based systems as the main focus to link their network members in their collaboration, and thus, use this Inter-Organizational Strategic Information Systems Planning (IOSISP) in their planning activities. The case studies are conducted in IZIT project (healthcare sector), D!MPACT project (government sector), and TRANSUMO project (logistic/transport sector). Each of them seems to be supporting each type of network governance described by Provan & Kenis (2007).

From the proposed conceptual model, the network governance variables from network governance theory and network effectiveness, together with IOSISP process planning dimensions and IOSISP effectiveness criteria are operationalized into interview questions.

We then analyze the findings from each of the case studies and do cross-case analysis of those multi-cases to come up with a conclusion and propose the validated model. Based on Miles & Huberman (1994), cross-case analysis is important to enhance generalizability and to deepen understanding and explanation. Cross-case analysis consists of variable-oriented (focusing vertically) and case-oriented (focusing horizontally). First we write up each of the cases using a set of variables we wanted to observe, and then use matrices in word table displays to analyze each case in depth. After that, we analyze the case-level displays and do a systematic comparison.

Figure 1.1 below explains our research framework.

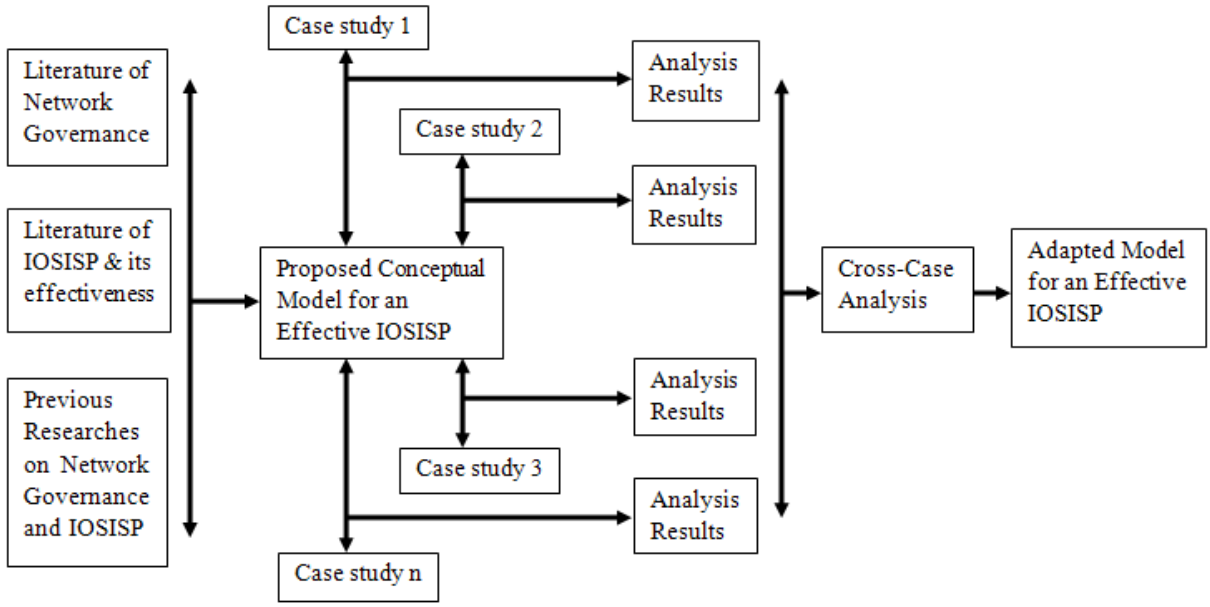

Figure 1.1. Research Framework

1.4. Structure

This report consists of seven sections. Section 1 describes the background of this research, research questions and research method. Section 2 discusses literature study on IOSISP, network governance theory described by Provan & Kenis (2007), network effectiveness (Provan & Milward, 2001), and IOSISP effectiveness (Segars & Grover, 1999 and Grover & Segars, 2005). Section 3 explains our conceptual model of network governance and IOSISP effectiveness. This model is then used as our basis in the multi-case studies, which is done by interviewing several key persons in the real cases of IOSISP projects. In Section 4 we describe each of the case studies. Section 5 explains the results from those case studies. Section 6 discusses the analysis of network governance effects on IOSISP effectiveness using cross-case analysis from the findings described in Section 5. Finally, Section 7 presents the conclusion on how network governance affects the IOSISP effectiveness, contributions and proposal for some future works.

2. LITERATURE REVIEW

2.1. Inter-Organizational Strategic Information System Planning (IOSISP)

Kumar & Crook (1999) defines Inter-Organizational Information Systems (IOS) as information technology (IT)-based systems that link multiple organizations. Johnston & Vitale (1988) explained that IOS consists of three parts: the business purpose that defines why the IOS is needed; the relation between actors linked by the system; and the information function of the system itself.

The Information System (IS) planning process is classified by Raghunatan & King (1988) as IS strategic planning activities and systems planning activities. They specifically stated that "The focus of IS strategic planning is to integrate the IS function with other major functions of the organization, while the focus of IS systems planning is to ensure integration among subsystems and hardware-software compatibility."

Spil (1996) defines Strategic Information Systems Planning (SISP) as "a process whereby an organization determines a portfolio of information systems to help it achieve its business objectives". According to Mulder & Spil (2007), those business objectives could lead to a cooperation between organizations, and will lead to what they called Inter-Organizational Information Systems (IOS).

Moreover, Mulder & Spil (2007) also state that "when the IOS is the result of a formal planning process, SISP is apparently no longer a process that is restricted to the borders of a single organization and Inter-Organizational Strategic Information Systems Planning (IOSISP), or networked SISP, enters the arena".

Figure 2.1 below shows a general input-process-output model of SISP based on King (1988), Lederer & Salmela (1996) and Brown (2004). This model is an extension of previous conceptual SISP theories (e.g. Lederer & Sethi, 1988) and provides a useful basis for examining the literature of SISP. Each definition of the terms used in the model is presented in Appendix C Table C1.

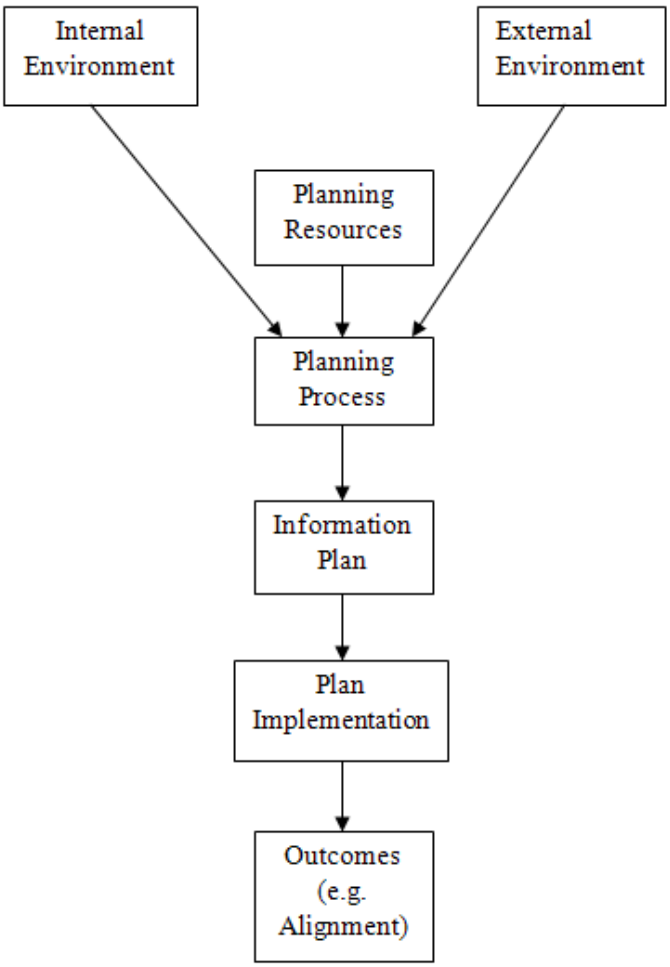

Figure 2.1. SISP input-process-output model

Van den Broek (2008) then proposes a conceptual research framework of IOSISP (Figure 2.2) based on this SISP input-process-output model and prior researches (Segars & Grover, 1998 and Segars & Grover, 1999). He proposes that IOSISP (or networked SISP) framework is divided into three parts; IOSISP input, IOSISP process and IOSISP effectiveness. Each definition of the terms used in this model is presented in Appendix C Table C2.

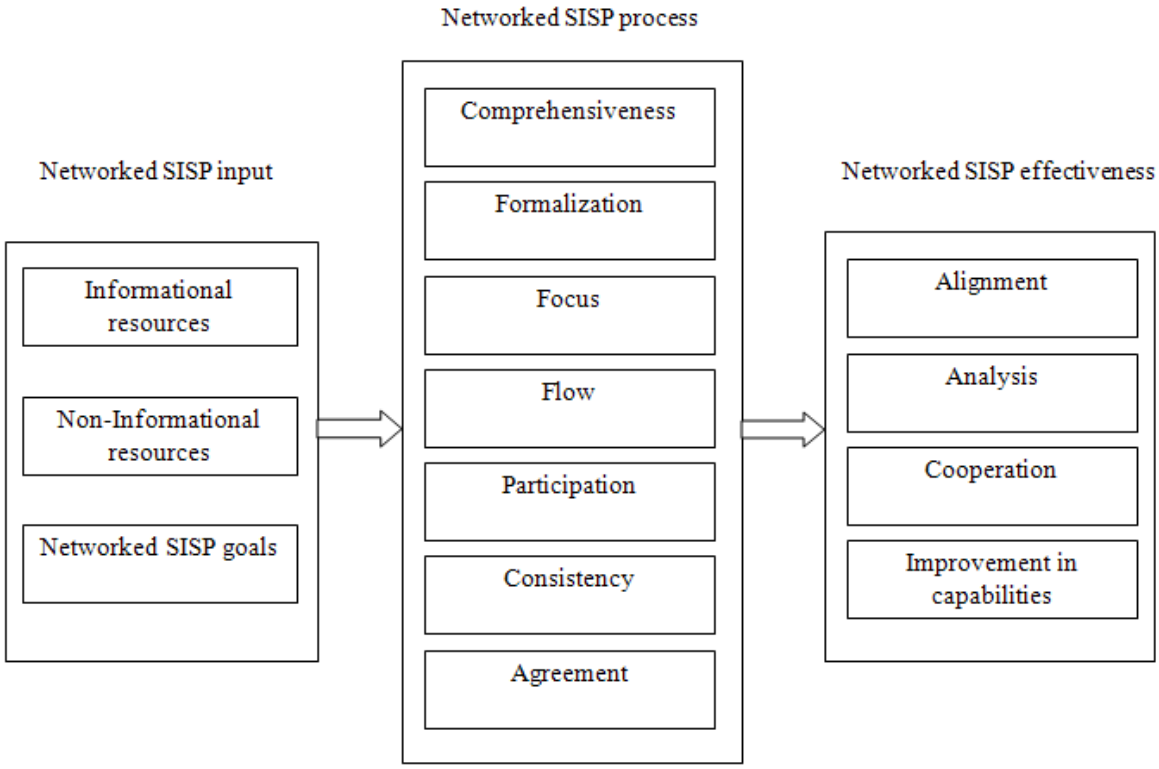

Figure 2.2. Conceptual research framework networked SISP (input-process-output model)

From this high-level conceptual research framework of networked SISP (input-process-output model), Van den Broek et al. (2008) then propose a simplified version that is depicted in Figure 2.3 below. The contextual factors act as an input to the IOSISP process that produces IOSISP outcome.

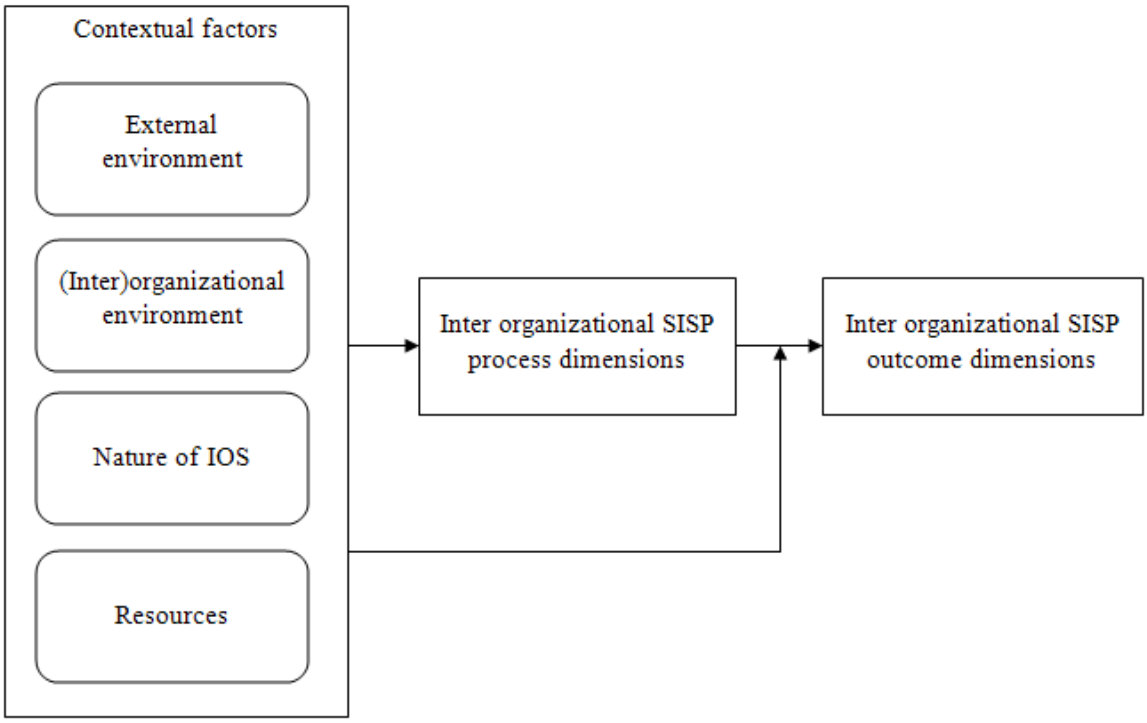

Figure 2.3. Research framework of IOSISP context (Van den Broek et al., 2008)

Van den Broek et al. (2008) specifically stated that "The planning process and the effectiveness of IOSISP are influenced by factors from the internal environment, external environment, the nature of planned IOS and resources". Figure 2.3 also explains that the contextual factors do not only act as an input for the IOSISP process but could also affect the IOSISP outcome even after the IOSISP process is done. Each definition of the terms used in Figure 2.3 is presented in Appendix C Table C3.

In relation with IOSISP process dimensions and its effectiveness described in Figure 2.2, another research from Segars & Grover (1999) examines this SISP from the perspective of process-based characteristics, or profiles. They combine the five schools of thought described by Mintzberg (1990) and SISP approach described by Earl (1993) with SISP process structures or dimensions (Segars & Grover, 1999). Segars & Grover (1999) specifically mentioned that "A cycle that may explain prevailing structures of SISP and reconcile previous investigation with the present study is (1) a "school of thought" that provides a philosophical basis for conducting the planning activity, (2) a general approach or set of activities that reflects managerial philosophy about SISP, and (3) a process structure that provides an infrastructure for conducting strategic planning".

Segars & Grover (1999) explain the relation between SISP process dimensions and SISP effectiveness and propose that there are five profiles of SISP, as depicted in Figure 2.4 below, in which the most effective planning profile across all four effectiveness dimensions (the alignment, analysis, cooperation and improvement in capabilities) is Profile 5, with its high rationality (comprehensiveness, formality, integration and top-down flow) and adaptability (broad participation and high consistency). Profile 2 performs well in analysis part, but low in cooperation and improvement of capabilities. Profile 1

and Profile 4 perform limited success of SISP effectiveness, and Profile 3 has the poorest performance of all, with its low rationality and adaptability.

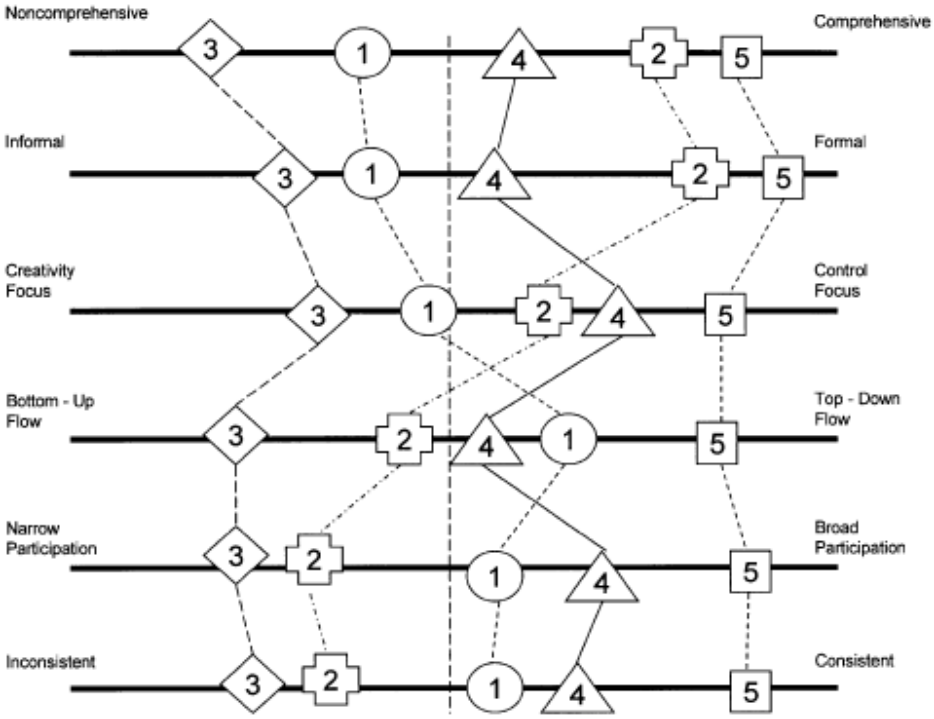

Figure 2.4. Mapping of Five Emergent Planning Profiles (Segars & Grover, 1999)

This mapping is then related to the five planning schools of thought (Mintzberg, 1990): Design, Planning, Positioning, Learning and Political school and the five SISP approaches (Earl, 1993): Business-Led, Technological, Method-Driven, Organizational and Administrative approaches. Figure 2.5 below explains the relation between planning schools of thought, SISP approach and SISP process structure:

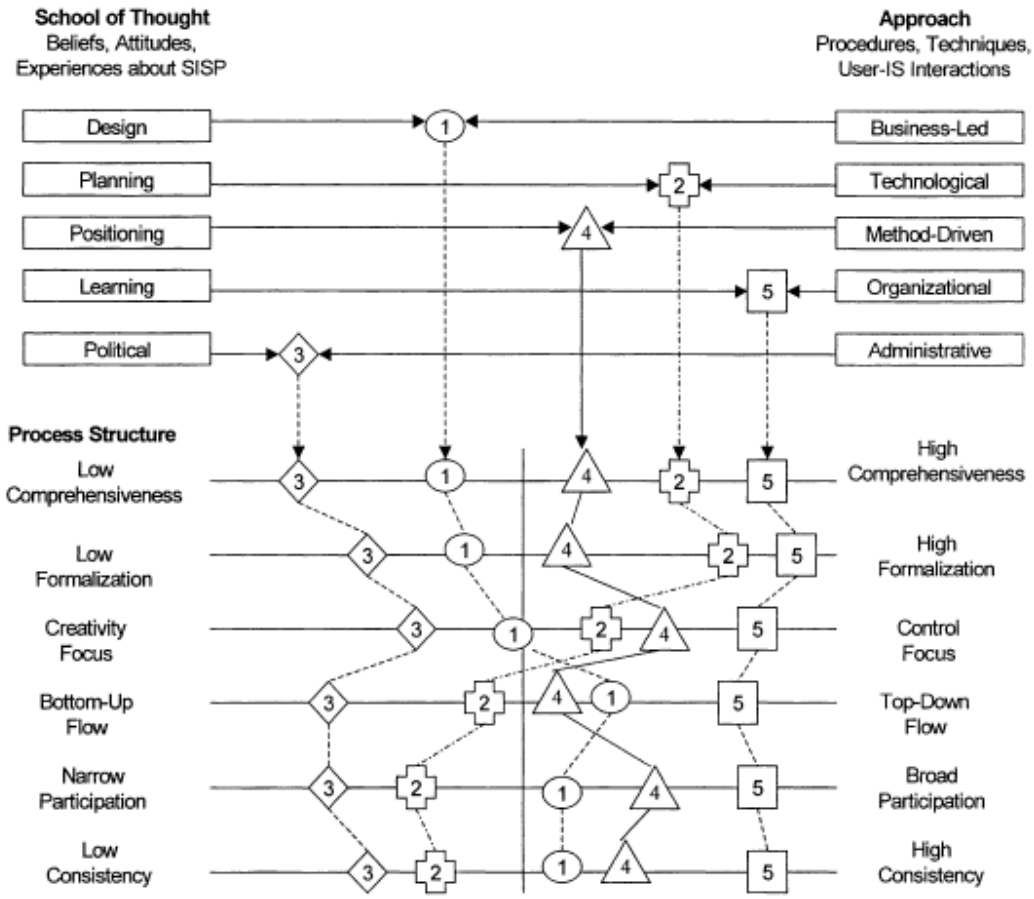

Figure 2.5. Planning Schools of Thought, SISP Approach and Process Structure (Segars & Grover, 1999)

As explained by Segars & Grover (1999), Profile 3 seems to follow the Political school of thought and the Administrative SISP approach, as the strategic planning process here tends to be strategy making through bargaining and negotiation. The Design school is reflected by Profile 1, in which the strategic planning is a conceptual process and invented through intuition, experience and informal knowledge of corporate events. In this profile, the Business-Led approach is used. Profile 4 follows the Positioning school and consistent Method-Driven approach, and Profile 5 describes the best planning behavior with its Learning school and Organizational approach.

This report will not address the explanation of planning schools of thought (Mintzberg, 1990); neither will it address the explanation of SISP approach (Earl, 1993) in details. However, we would use Segars & Grover (1999) profiles of SISP depicted in Figure 2.4 to analyze case study results in the relation of process dimensions and IOSISP effectiveness, which would be described later in Section 6.

From the result of this IOSISP literature studies, we answered the first point of our first research question (Q1) stated in Section 1.2, a brief explanation of what IOSISP is.

2.2. Network Governance Theory

The idea of network governance and its effectiveness derived primarily from a comparative study of inter-organizational networks of four community mental health systems in United States by Provan & Milward (1995). In general, they propose that some kind of network structure in inter-organizational network will lead to network effectiveness under certain conditions of network context. The measurement of network effectiveness itself is then studied next by Provan & Milward (2001), and will be explained further in Section 3.2.

The governance of organizational networks and its impact on network effectiveness are then examined by Provan & Kenis (2007), in which they propose to combine the network analytical and governance perspectives which have been separately insufficient to analyze functioning and governance at network level. They describe network as a mechanism of coordination, or network governance. Here, the network itself is viewed as a variable that could be analyzed and measured. They define network effectiveness as "the attainment of positive network level outcomes that could not normally be achieved by individual organizational participants acting independently".

First, Provan & Kenis (2007) identify the three basic forms of network governance. From these network governance forms, they develop four contingency conditions that are likely to affect the successful adoption of each governance form. The choice of each governance form could produce specific tensions that are discussed next. And then, how network governance form could evolve will be described as their final discussion.

Below we briefly describe the three basic forms of the network governance and its four contingency conditions that are likely to affect the successful adoption of each governance form.

2.2.1. The Three Governance Forms

1. Shared Governance (or Participant-Governed Network)

In this kind of governance form, there is no unique or formal governance structure, because all network members have the same power to make decisions and manage network activities, thus, there is no single member that represents the whole network.

2. Lead Organization

In contrary with shared governance, in lead organization form there is one member acts as a leader, and all decisions and network activities are managed and coordinated through the leader. This leader is usually a member of the network that has more power in the network, such as has more resources and legitimacy to lead the network. In this sense, lead organization governance form is highly centralized.

3. Network Administrative Organization (NAO)

Different from two forms described before, in NAO form, network members do not have power to make decisions and manage network activities, nor do they have one member of the network acts as a leader. Instead, there is a special administrative entity that is set up specifically to manage the whole network. This external entity governs and supports the network and has the power to make decisions. In this sense, this NAO form is centralized, although all network members still interact with each other.

2.2.2. The Four Contingency Conditions

1. Trust

How trust is distributed among network members is important in the network-level governance. Trust would be very critical for instance in shared governance form, because all network activities are managed by all members in the network.

2. Number of participants

Number of participants in the network is the other critical issue in network governance. When the number of participants in the network gets larger, the network will be more difficult to coordinate and manage, thus would increase the problem complexity in the network.

3. Goal consensus

According to Provan & Kenis (2007), goal consensus has important implications for network governance. Specifically, they state that "consensus in goals and domain similarity allows organizational participants to perform better than when there is conflict, although conflict can also be a stimulant for innovation".

4. Need for network-level competencies

The last issue is that in network governance, there is a need for network-level competencies among organizations; they are seeking to achieve something that they could not achieve independently. Network-level competencies here are defined as competencies of the network that will be achieved through the attainment of network-level goals.

Those four conditions also reflect a contingency theory described by Daft (2001). He explains that "Contingency means that one thing depends on other things, and for organizations to be effective, there must be a 'goodness of fit' between their structure and the conditions in their external environment". In relation with this network context, a recent research by Rodriguez et al (2007) elaborates mandated collaboration, in which "collaboration is imposed on separate organizations by a third party with its range of influence". They study whether the initiation of mandated collaboration that forms a network could affect the successfulness of the collaboration with emphasizing the governance challenges of developing this mandated collaboration within a network. As what Salmivali (2008) mentions, this mandated collaboration is "particularly suitable for describing public sector network initiatives in which there is usually a governmental body imposing its will on individual actors". This condition seems to be quite important in practice, but not included as a contingency condition that might affect the adoption of governance form in Provan & Kenis (2007). Their argument is that many networks are formed by choice, and mandated networks usually do not have possibility to choose a governance form. The categorization of network governance forms described by Provan & Kenis (2007) is based on the conditions of their internal members and its relation within the network.

The table below summarizes the relationship between the governance forms and the contingency conditions described by Provan & Kenis (2007).

Governance Forms	Trust	Number of Participants	Goal Consensus	Need for Network-Level Competencies
Shared governance	High density	Few	High	Low
Lead organization	Low density, highly centralized	Moderate number	Moderately low	Moderate
Network administrative organization (NAO)	Moderate density, NAO monitored by members	Moderate to many	Moderately high	High

Table 2.1. Key Predictors of Effectiveness of Network Governance Forms

As shown in Table 2.1, based on the first propositions described by Provan & Kenis (2007), a network that has few network members and high density of trust, high goal consensus and low need of network-level competencies gives high level outcomes when shared networked governance is applied. Next, lead organization network governance will be most effective in a network that has relatively more members, trust is a bit less widely shared, goal consensus is moderately low and the need for network-level competencies is moderate. And NAO network governance will be most effective when the numbers of network participants are moderate to many with moderate density of trust among them, goal consensus is moderately high, and the need for network-level competencies is also high. As a consequence, if the inconsistency between those four critical contingency factors and defined governance form increases, that particular governance form will be ineffective.

The three governance forms (shared, lead and NAO types) and its four contingency conditions (trust, number of participants, goal consensus and the need for network level competencies) described above have a relation with the contextual factors described by Van den Broek et al. (2008). He explains that inter-organizational environment, which is one of the contextual factors, consists of inter-organizational structure and governance, also inter-organizational size. Business goals and plans, and non informational resources such as trust on the other hand, explained the external environment. This relation will be used later to explain how we could position our proposed conceptual model of network governance in the IOSISP context (Section 3.4).

Other research from Salmela & Spil (2006) adopted Adler (2001) and Ouchi (1979) researches of network from the economic and organizational mechanisms and distinguish network coordination mechanism into three types, namely relational, hierarchic and contractual types. Each of these types seems to reflect each type of the three governance forms described by Provan & Kenis (2007). As what Salmela & Spil (2006) explain, hierarchic network is a centralized design of network, like in lead governance type; relational network promotes shared network values as in the shared governance form; and contractual network uses third party in resolution, as what happens in NAO governance type.

Next, similar with those categorization presented by Salmela & Spil (2006), Adler (2001) and Ouchi (1979), the categorization or mapping between type of governance with its contingency conditions or contexts presented by Provan & Kenis (2007) is also analogical with how Mintzberg (1990) distinguishes

his five schools of thought, namely Design, Planning, Positioning, Learning and Political schools. Mintzberg (1990) tries to categorize managerial attitudes (those five schools of thought) based on the activity of SISP; such as its theme, core belief, and behavior.

2.2.3. The Three Tensions

Next, Provan & Kenis (2007) discuss three tensions as a result of the choice of network governance form and how the management of these tensions is critical related to the network effectiveness.

1. Efficiency versus Inclusiveness

The first tension is between efficiency and inclusiveness. Efficiency comes as a desired outcome in the collaboration of organizations in the network. Inclusiveness here means the need for member involvement which is done through an inclusive decision making. Each governance form will tend to either have more efficiency or inclusiveness.

2. Internal versus External Legitimacy

As stated by Suchman (1995), legitimacy is very important for maintaining organizations in the network. Human & Provan (2000) support that statement and mention that legitimacy is not only critical, but must be addressed both internally and externally. Provan & Kenis (2007) define internal legitimacy as a focus on the needs of network or organizational stakeholders such as clients, employees and board members, and define external legitimacy as the need of attracting customers, dealing with any other external entities such as government, and so forth. Any form of network governance tends to be responsive to either internal or external legitimacy.

3. Flexibility versus Stability

The last tension that is critical as a result of the choice of specific network governance form is flexibility and stability.

> "Flexibility allows networked organizations to respond quickly to competition and other environmental threats, as well as to opportunities. At the same time, networks that are not simply focused on a temporary, short-term project must also focus on sustainment. Stability is critical for maintaining legitimacy, both inside and outside the network." (Provan & Kenis 2007, p. 16-17).

At the end of their explanation, they add: "As with the other two network tensions, no single form of network governance is capable of fully addressing the stability-flexibility tension."

Governance Forms	Need of Efficiency or Inclusiveness	Addressing Internal or External Legitimacy	Need for Flexibility or Stability
Shared governance	Inclusive	Internal	Flexibility
Lead organization	Efficiency	External	Stability
NAO	Balance, but more efficiency	Both are addressed in sequential fashion	Stability

Table 2.2. Network tensions propositions

As shown in Table 2.2, first, networks face a tension between the need of efficiency or inclusiveness. In shared governance forms, the tension will favor inclusiveness; in lead organization forms, the tension will favor efficiency; and in NAO forms, the tension will be balance but favor efficieny. Next, networks also face a tension between the need for internal or external legitimacy. In shared governance forms, the tension will favor internal legitimacy; in lead organization governed forms, the tension will favor external legitimacy; and in NAO forms, both tensions are addressed sequentially. And last, networks face a tension between the need for flexibility or stability. In shared governance forms, the tension will favor flexibility; and in both lead organization and NAO forms, the tension will favor stability.

These network tensions could also be explained from a study of organizational theory and design by Daft (2001), which proposes that "The correct relationship among cultural values, organizational strategy and structure, and the environment can enhance organizational performance" and divides four categories of culture based on (1) the extent to which the competitive environment requires flexibility or stability, and (2) the extent to which the strategic focus and strength is internal or external. Those four categories are adaptability/entrepreneurial, mission, clan and bureaucratic cultures. Each of them could be successful depends on the correct adoption of the corporate culture. The differentiation of those categories is similar with what Provan & Kenis (2007) propose about network tensions that might arise depend on specific governance form. For example, the clan culture is described by Daft (2001) exists in organizations that focus on the involvement (inclusiveness) and member's participation. They need more flexibility than stability and more focus on internal than external strategy. This category reflects the tensions within shared governance form described by Provan & Kenis (2007), in which it needs more inclusiveness and flexibility, and addressing more internal than external legitimacy. This finding increases our belief that network tensions are there in practice and should also be considered as an important part in the network.

2.2.4. The Network Evolution

The final issue described by Provan & Kenis (2007) is network evolution, which is the change of network governance forms. For instance, when the number of participants in the shared governance form gets larger, the network structure will change, because the current form will be ineffective as the network will be more complex and difficult to coordinate and manage. Specifically, they propose that:

> "Assuming network survival over time, as network governance changes, it is likely to evolve in a predictable pattern from shared-governance to a more brokered form and from participant governed to externally (NAO) governed. Evolution from shared-governance to either brokered form is significantly more likely than evolution from a brokered form to shared-

> governance. Once established, evolution from an NAO to another form is unlikely." (Provan & Kenis 2007, p. 19)

However, the movement, or changes of network governance from one form to another, or the evolution, involves strategic choice. They explain that "evolution is not simply a natural process that occurs as contingency components change. Rather, a specific choice must be made by network participants and managers to turn network governance over from one or more participants to a third party organization".

This network evolution issue is also studied by Daft (2001), where he mentions that "Organizations are not static; they continuously adapt to shifts in the external environment". Moreover, "Many companies are facing the need to transform themselves into dramatically different organizations because of new challenges in the environment".

From the result of this network governance literature studies, we answered the second point of our first research question (Q1) stated in Section 1.2, theoretical reviews of network governance.

2.3. Network Governance in Industries

Provan & Kenis (2007) mention that in general, shared governance networks is common in the health and human services industries, where all organizations in the network have the same power, as in horizontal type of relationship described by Hong (2002). Hong (2002) differentiates the linkage, which means a formation via interconnection of organizations in the network, into two types, horizontal and vertical. Horizontal role linkage happens in the network with homogeneous members that share a common role. Vertical role linkage on the other hand, happens in the network with heterogeneous members that cooperate to add value to existing products or services, an example of this type is buyer-seller networks. Next, Provan & Kenis (2007) then mention that lead organization governance networks often occurs in vertical relationships, such us buyer-supplier relationship, as there is usually one large or powerful company that plays a lead role in the network, such as in manufacturing industry. However, lead organization networks could also occur in government industry, and also in health and human service, especially when there is a core provider agency that has a central position and has sufficient resources and legitimacy in the network. The last form of network governance, the NAO governance form is described by Human & Provan (2000) occurs in networks that demand wide variety of competencies to be managed with limited trust between respondents. This form seems to follow a mixture type between horizontal and vertical relationship described by Hong (2002).

Daft (2001) specifically stated that "Managers were deeply involved in organization theory each day of their working lives – but they never realized it". This fact gives support to our research, in which we believe that the awareness of organizational contexts and governance could help industries to analyze what is happening in the network internally and externally, to diagnose what they should do, and what changes needed based on its internal and external demands to keep the competitiveness value of the network. As what Daft (2001) explains, "Organization theory helps organizations to understand and explain what happened in the past, as well as what may happen in the future, so that they can manage their organizations more effectively".

From this information we answered the third point of our first research question (Q1) stated in Section 1.2, the characteristics of network governance in health care, government and logistic/transport industry sectors.

3. THE CONCEPTUAL MODEL

3.1. Preliminary Framework of Network Effectiveness

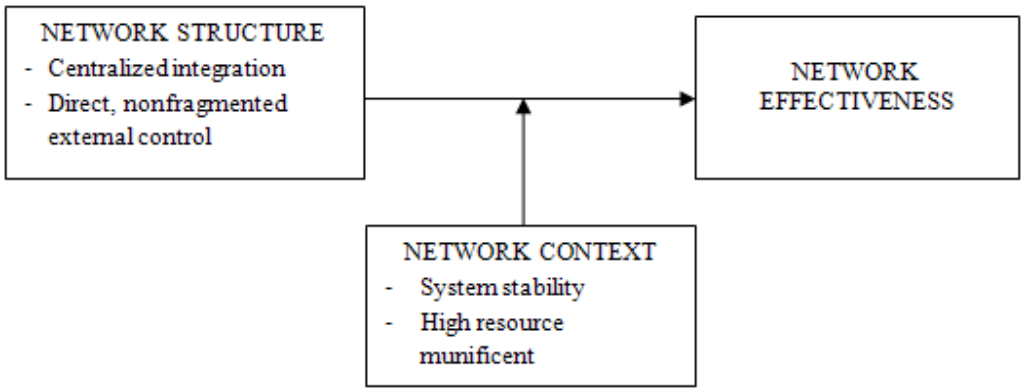

Figure 3.1. Preliminary Framework of Network Effectiveness (Provan & Milward, 1995)

The figure above is a preliminary model of network effectiveness proposed by Provan & Milward (1995), as a result of their research of inter-organizational network effectiveness, using a comparative study in four community mental health systems in United States. Their proposition is: "Networks will be effective under structural conditions of centralized integration and direct, non fragmented external control, but that effectiveness will be highest when the system is also stable and environmental resources are relatively munificent."

It means that there is a relation between network structure and network effectiveness, in which network structure will give positive influence to network effectiveness under certain conditions described above, and that network effectiveness will also be enhanced under certain conditions of network context; general system stability and high resource munificence, although network context alone is not a sufficient condition to achieve network effectiveness.

The conceptual model we are going to propose will be based on this preliminary model of network effectiveness, and will be described in Section 3.3.

3.2. Network and IOSISP Effectiveness

Effectiveness itself is something that should be measured. Provan & Milward (2001) discuss an evaluation of inter-organizational networks in publicly funded health, human service and public welfare organizations. Based on a multi-stakeholder perspective, they differentiate the evaluation of network effectiveness into three levels of analysis: community, network and organization/participant levels. All of them should be considered though not necessarily in equal basis. The stakeholders of those three different levels are principals, agents and clients. They explain that "these levels are of concern to three broad categories of network constituents; principals, who monitor and fund the network and its activities; agents, who work in the network both as administrators and service-level professionals; and clients, who actually receive the services provided by the network". However, they also mention that in practice, there might be an overlap across levels.

Below is the summary of network evaluation relationships by Provan & Milward (2001).

Levels of network analysis	Key stakeholders groups	Effectiveness criteria
Community	Principals and Clients: • Client advocacy groups • Funders • Politicians • Regulators • General public	• Cost to community • Building social capital • Public perceptions that problem is being solved • Changes in the incidence of the problem • Aggregate indicators of client well-being
Network	Principals and agents: • Primary funders and regulators • Network administrative organization • Member organization	• Network membership growth • Range of services provided • Absence of service duplication • Relationship strength (multiplexity) • Creation and maintenance of network administrative organization (NAO) • Integration/coordination of services • Cost of network maintenance • Member commitment to network goals
Organization/Participant	Agents and clients: • Member agency board and management • Agency staff • Individual clients	• Agency survival • Enhanced legitimacy • Resource acquisition • Cost of services • Service access • Client outcomes • Minimum conflict for multiprogram agencies across multiple networks

Table 3.1. Summary of Network Evaluation Relationships (Provan & Milward, 2001)

At the community level, the key stakeholder groups are the principals and clients. Here network should be evaluated by their contribution to the communities they are trying to serve, or how they could benefit their 'clients', who are the receivers of the services provided by the network.

At the network level, the key stakeholder groups are the principals and agents. The network at this level should be assessed by the network survival and ability to maintain its members.

Next Provan & Milward (2001) stated that "Although network - and community – level outcomes are valid ways of evaluating networks, it is important to recognize that individual agencies and their managers are still motivated partly by self-interest. The relevant question is then: How can network

involvement benefit my agency?" So, network should also be effective at the organization/participant level. At this level, the key stakeholder groups are the agents and clients. The network itself could be evaluated on four primary criteria: client outcomes, legitimacy, resource acquisition and cost. In general, participants joined the network with their own interests such as to enhance their legitimacy in the community and to acquire better resources.

Next, in relation with the evaluation of network effectiveness describe above, Provan & Milward (2001) also explain that there are relationships between effectiveness at different levels of network analysis and moreover, there is influence by key stakeholders. As Figure 3.2 shows, they explain that "outcomes at each level of analysis have a direct effect on outcomes at another level. In addition, while each of the broadly defined stakeholder group is unique conceptually, in practice they overlap so that outcomes that satisfy one group can at least partially satisfy another group".

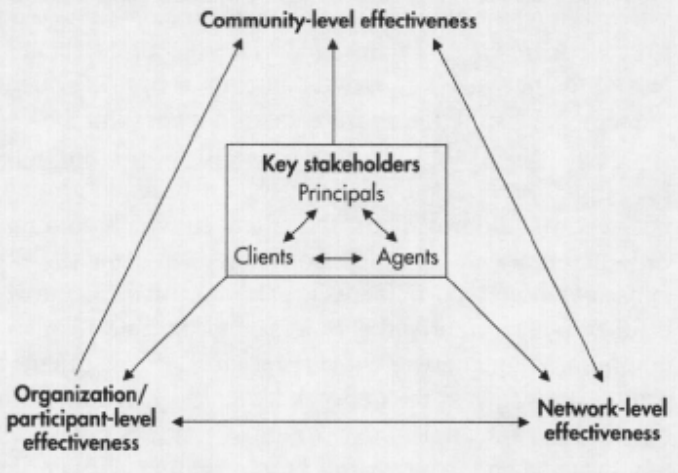

Figure 3.2. Relationships between Effectiveness at Different Levels of Network Analysis and Influence by Key Stakeholders (Provan & Milward, 2001)

This network effectiveness defined by Provan & Milward (2001) refers to the attainment of positive network level outcomes, whereas our research intends not to evaluate the effectiveness of the network itself, but to evaluate the effectiveness of information strategy (SISP) applied in the network with its specific governance form (structure) and context. However, from the network perspective, we argue that there is a relation between network effectiveness and the effectiveness of information strategy applied in the network (IOSISP). Thus, this network effectiveness defined by Provan & Milward (2001) would also be placed as a part of our conceptual model of network governance and IOSISP effectiveness. However, a detail relationship between effectiveness at different levels of network analysis and the influence by key stakeholders as depicted in Figure 3.2 would not be addressed further in this research. In the case studies, that will be explained later in Section 4, we derive network effectiveness interview questions from the network effectiveness criteria of each different levels of analysis described in Table 3.1.

Next, we search literature on SISP effectiveness evaluation. Based on the findings from Spil & Salmela (2007) in evaluating SISP, King (1988) was the first who evaluates SISP and generates the first model of SISP evaluation. King's result is then used in many researches of quantitative studies (Premkumar & King, 1994; Raghnunathan & Raghnunathan, 1991). On the other hand, qualitative studies

such as McLean & Soden (1977), Pyburn (1983) and Earl (1993) also identified different planning approaches and effectiveness measurement using different criteria. Next, Spil & Salmela (2007) found out that there is a recent research of IOSISP effectiveness analysis and measurement that combined the results of those qualitative and quantitative studies (Segars & Grover, 1999; Grover & Segars, 2005).

In our proposed conceptual model, we also suggest using that recent research; the four dimensions of network effectiveness: alignment, analysis, cooperation and improvement in capabilities (described previously in Section 2.1) defined by Segars & Grover (1999) and Grover & Segars (2005), to measure networked SISP effectiveness. Table 3.2 below explains the four dimensions of networked SISP effectiveness and its descriptions, together with the measurement results.

Dimensions	**Descriptions**	**Measurement results**
Alignment	Linkage of the IS strategy and business strategy	Low Alignment – High Alignment
Analysis	Understanding of processes, use of information, power bases, and existing technologies	Low Analysis – High Analysis
Cooperation	General agreement concerning development priorities, implementation schedules, and managerial responsibilities	Low Cooperation – High Cooperation
Improvement in Capabilities	Improvement in planning capabilities over time	Low Improvement – High Improvement

Table 3.2. Networked SISP effectiveness

These definitions of each networked SISP effectiveness described above are then adapted in the network perspective (as could be seen in the interview questions in Appendix A). The alignment dimension is measured through the ability of the network governance to align network members' goal with network goal. The analysis dimension is assessed whether the awareness of network governance with its contexts, tensions and evolution could lead to a better management of the project, thus also lead to a better understanding of business processes, procedures and technologies. Next, the cooperation dimension is measured from the competence of its network governance to lead to a better mutual cooperation among network members. And last, the improvement in capabilities dimension is assessed through how network governance affects the IS planning process positively and the ability of the network governance to improve plans in the future.

Even though network effectiveness presented in Table 3.1 and the IOSISP effectiveness presented in Table 3.2 have different evaluation approach; one from a general network point of view and the other from the IS strategy point of view, some of the network effectiveness criteria could be related to those IOSISP effectiveness criteria: the member commitment to network goals and relationship strength criteria from the network level of network effectiveness could be related to the cooperation criterion in the IOSISP context; absence of service duplication and integration/coordination of services from the network level of network effectiveness could be related to the analysis criterion in the IOSISP context. From this finding, with regard to the observation of IOSISP effectiveness in network perspective, we argue that IOSISP outcome should consist of both IOSISP and network effectiveness.

Within this section we answered the remaining points of our first research question (Q1) stated in Section 1.2; theoretical review on network and IOSISP effectiveness, and how we can measure those.

3.3. Effectiveness Model in Network Perspective

We need to have more insight on the network context and its influence on the process and effectiveness of IOSISP as the relatively higher complexity of IOS compared to intra-organizational systems urges the need of IOS planning (Finnegan et al., 1996). As previously stated, there has been little research conducted on IOSISP and additionally, the planning and implementation of large IOS face a lot of challenges. The structural properties (shared, centralized/decentralized) of the network are important aspects in IOSISP context.

Based on the preliminary model of network effectiveness described in Section 3.1 (Figure 3.1) and the propositions on network governance by Provan & Kenis (2007) described in Section 2 (the three governance forms, its contingency conditions and network tensions), also the evaluation of network effectiveness by Provan & Milward (2001) described in Section 3.2, we then propose a conceptual model that explains how IOS collaboration could achieve an effective network-level outcome with adopting network governance theory.

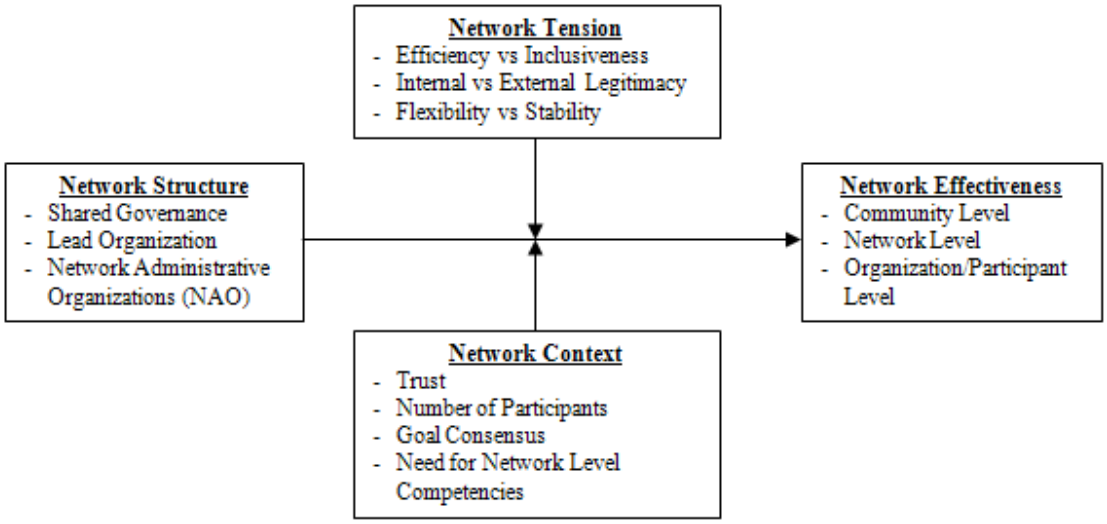

Figure 3.3. Conceptual model derived from a preliminary model of network effectiveness (Provan & Milward, 1995; Provan & Milward, 2001) and network governance (Provan & Kenis, 2007)

As described in Section 3.1, network structure is related to network effectiveness, and the correct choice of network structure will give positive impact to network effectiveness. Moreover, network effectiveness will be enhanced under several conditions of network context, although network context alone is not a sufficient condition for effectiveness.

The proposed conceptual model depicted in Figure 3.3 describes network structure that represents the three governance forms, network context that represents those four contingency conditions which are likely to affect the successful adoption of each governance form, the three tensions as a result of the choice of network governance form, and the three levels of network effectiveness.

Using the same propositions from the preliminary model of network effectiveness and previous researches, the proposed conceptual model explains that within IOS collaboration, the correct choice of the governance form in its network will give positive impact to network effectiveness, which could be measured in three different levels. Moreover, during its implementation process, network effectiveness will be enhanced under several conditions of network context (based on its propositions described in Table 2.1 at page 20) and network tensions (Table 2.2 at page 22).

This conceptual model of network governance effectiveness could not stand alone and should then be positioned in the IOSISP context framework that will be explained later in Section 3.4.

With our conceptual model described above, we answered the first point of our second research question (Q2) stated in Section 1.2; what relationships exist between network governance and its effectiveness with IOSISP effectiveness.

3.4. Positioning the Conceptual Model in IOSISP Context

Literature sources of IOSISP described in Section 2.1 present some previous networked SISP (input-process-output) models. With regard to the high-level research framework describe by Van den Broek (2008) and Van den Broek et al. (2008) as depicted in Figure 2.3, we position the effectiveness model (Figure 3.3) in that current IOSISP research framework.

As explained by Van den Broek et al. (2008), (Inter)organizational environment consists of (Inter)organizational structure and governance, (Inter)organizational size, organizational culture and the role of IS function. Whereas resources consists of informational resources (business goals and plans, IS mission and vision), non-informational resources (user, IT and top management commitment, financial resources, trust) and IOSISP planning goals.

By positioning the network governance effectiveness model into this contingency model based on the research framework described in Figure 2.3, we try to integrate the network governance as a part of the IOSISP contextual factors with IOSISP process dimensions and IOSISP outcome dimensions (effectiveness).

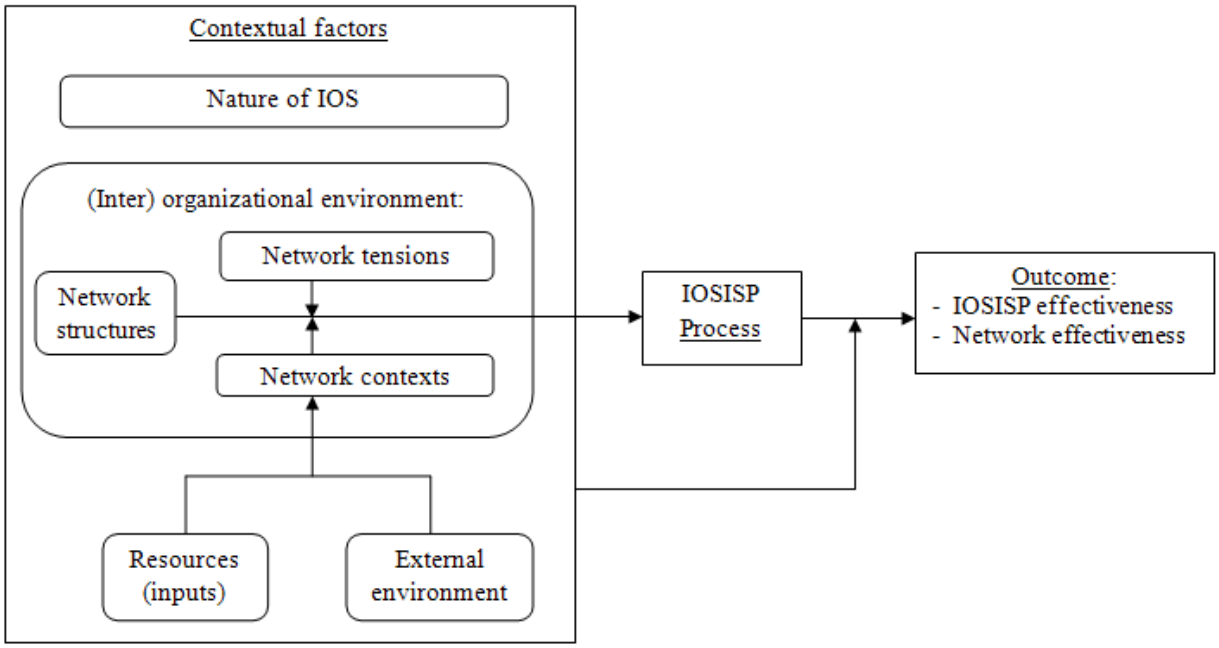

Figure 3.4. Adapted research framework of IOSISP context

We propose that within IOS collaboration, the correct adoption of network structure or network governance form with its contexts and tensions would lead to network effectiveness, and should be placed in the (Inter) organizational environment part of the contextual factors of IOSISP context. We argue that Resources (input) factor should have a relation with or impact to the (Inter) organizational environment. The Resources (input) sub factor explained by Van den Broek et al. (2008) seems to have relation with the network context in the (Inter) organizational environment, which are trust, number of participants, goal consensus and the need of network-level competencies. The External environment sub factor also seems to have a relation with the network context, specially related with the need of network level competencies that could be measured with the external demands and needs that are being faced by the network (e.g. environmental shocks such as shifts in funding or new regulations, seeking out new members, acquiring funding, etc). We propose that network context could be provided by or related with Resources (inputs); business goals and plans, trust, IOSISP planning goals, etc and External environment.

Next, from the network perspective, as mentioned at the end of Section 3.2, we then argue that IOSISP outcome, as the result of IOS collaboration that is governed with specific governance form, should be measured not only by the effectiveness of IOSISP itself (Table 3.2 at page 28) but also by network effectiveness (Table 3.1 at page 26), which is the effectiveness of network governance adopted in the IOS collaboration.

As stated before, assuming network survival over time, there could be changes of network context among the organizations (number of participants, goal consensus, etc.) and strategic choice that is made by network participants or managers because of several reasons such as external factors (market demand, etc.), which would change the network structure; thus will affect the process planning. Therefore here we should see the framework as a dynamic process instead of a one-stop process, as there could also be an evolution of the network itself.

From this section, we answered the second point of our second research question (Q2) stated in Section 1.2; how we can position our finding in the current IOSISP context. The remaining sections of this report will give answers to the last research question (Q3) stated in Section 1.2. We ensure the suitability of our proposed model in practice, which is validated through the case studies in health care, government and logistic/transport industry sectors.

4. CASE STUDIES

The main goal of the case study was to investigate whether network governance is present in the investigated IOS collaboration and if so, how it affects IOSISP effectiveness. Through these case studies we aim to validate the adapted conceptual framework of IOSISP context depicted in Figure 3.4. We claim that the network governance described by Provan & Kenis (2007) is necessary and important to be considered in IOS collaboration in order to achieve an effective IOSISP. Using the case studies, we want to demonstrate whether this network governance is there in practice and moreover important for achieving an effective IOSISP.

As noted before, for the case studies, we operationalize network governance variables from the network governance theory, IOSISP process dimensions and IOSISP effectiveness criteria into interview questions (Appendix A). Relevant items from Mulder & Spil (2007) and Van den Broek (2008) interview on process and effectiveness of IOSISP were added to our interview scheme. The following subjects were covered: introduction and context of the project; contingency conditions; form of network governance; network tensions; network evolution; network effectiveness, IOSISP process and IOSISP effectiveness. The interviews are recorded and then transcribed and analyzed. We also use other data sources such as organization and projects' websites and documentations from previous studies and researches to support our analysis.

For the first case study, we revisit IZIT (health care industry sector). IZIT organization has been studied before (Mulder. 2007 and Mulder & Spil, 2007) for a different research topic. The second case study is conducted in D!MPACT (government sector) and the last case study is done within TRANSUMO projects (logistic/transport sector). We aim to observe how network governance differs in those three industry sectors.

The general information of each case study is described as follows:

4.1. IZIT

Make ICT innovation in Twente, or IZIT, was created as one of the objectives of ICT Connection Make Twente (icZt). icZt consists of 9 providers, and its main goal is to use ICT innovation in health care industry in Twente region. The exact start date of IZIT program is difficult to identify, but the first Project Initiation Documents (PID) was in 2003. There are 3 clusters within IZIT project:

1. Cluster chain (e-monitoring, reporting and e-medication)
2. Cluster protocols and processes
3. Technological Innovation Cluster

Below are the several projects defined in the program:

1. Electronic Medication Dossier (EMD)
2. Application System Provider for the 1st line (ASP)
3. Switch Platform (SPL)
4. Make Regional Portal (RZP)
5. Make transmural Protocols (TZP)
6. Electronic Patient Dossier (EPD)
7. Zorgzame Area and Teleservices (ZBT)

8. Mobile healthcare (MZV)

Mulder (2007) did a research on the importance of trust for strategic and control information system planning limits in organization using IZIT as a case study. He did 10 interviews to several key persons in IZIT program. For our case, we revisit this program and conduct interview to 3 key persons, in which 2 of them have been interviewed before (Mulder, 2007).

4.2. D!MPACT

The need of a customer-oriented government is now evolving from both the government and citizens. More and more public services are therefore expected to be available digitally. However, municipalities, provinces and other public services often do not have sufficient expertise and resources to digitalize their services. This is why cooperation with each other would help.

D!MPACT is a cooperative association for and by municipalities. The objective of D!MPACT is to provide a solution for digital multi-channel service to its members. D!MPACT organizes inter-municipal cooperation for the development and purchase of this service.

D!MPACT now has 14 members; all are public parties, which are municipalities. They actively participate and affect the operation of D!MPACT. Each participating municipality has an equal vote, regardless of its size. The members give direction to suppliers and have influence on the development of products. They have control over the entity, the management and policy of the organization.

4.3. TRANSUMO

TRANSUMO is a national Dutch research program established in 2004 and funded by the Dutch government together with private sector and knowledge institutions. This also explains that TRANSUMO is a join of public and private parties. Its goal is to initiate and support a transition to a sustainable mobility system by supplying knowledge that is necessary with developing technologies and concepts and at the same time also researching implementation and transition issues.

The research aims to develop and implement integrated solutions in the domains of ‘mobility of persons’, ‘freight transport and logistics’, ‘traffic management’ and ‘infrastructure development and management’. The research within TRANSUMO has seven themes that address specific issue:

1. Self Regulation: Self-regulation by pricing and other incentives in passenger transport.
2. Traffic Management: Integrated infrastructure and traffic management.
3. Governance Processes: Participative governance processes in mobility and freight transport.
4. Space: Tuning spatial system and accessibility.
5. Chain Integration: Logistics chain integration.
6. Network Integration: Integrated logistics networks.
7. Public Transport: Customer-oriented public transport.

5. CASE STUDIES RESULTS

In this section, we present the results from each case study. The main points we would like to analyze from each case study (as covered in the interview schemes) are the network governance type, network tensions, network evolutions, network effectiveness, IOSISP process and IOSISP effectiveness. The detail interview results are presented in Appendix B.

5.1. IZIT

A total number of 3 interviews were conducted within a time period of 10 days. The selection of the interviewees is based on their knowledge of the overall project. All of the interviewees are in the level of project manager and project employee. The interview took place at the interviewee's office and one of those took place at the University of Twente. The approximate time of each interview is around 1 – 1.5 hour. On this case, much interview material from Mulder (2007) especially in IOSISP process dimensions part was used to complement the findings.

Below we present the results of each main point of the interview scheme:

Network governance type

IZIT could be seen as an 'agent' or external administrative entity that works in the network as the administrator to maintain the whole projects. IZIT is a name of project organization that does administrative tasks. The board or the one who monitors the network and its activities, and acts as a 'leader' in the network and has the power to make decisions is the icZt. All network members still interact with each other through its representatives within IZIT governance.

The trust is diverse among members and it fluctuates over time, also fluctuates between people. Number of participants are counted around 14 – 19 participants. In a very abstract level, they always have the same goal, which is making things easier for the patients. But in fact there are a lot of competitions between health care providers and they have to focus on their own marketing and it is sometimes hard to make a consensus. As one interviewee answered, "the goal consensus is somewhere between low and high". Next, within IZIT there is a need of very high interdependence among members and high need of external demands. Other interviewee explained, "They need to cooperate. But sometimes their personal interests do conflict with the overall interests. Not all members are aware about the need of working together".

With regard to the number and size of participants in the network, beside number of participants, the size and complexity of participants also has important influence in the network. One of the interviewee said that "the diversity of the organization's type is the most influencing thing on the network". The other interviewee added "the larger and more complex participants have stronger position in the network".

There was also an agreement among interviewees that the knowledge of network context such as trust between network members, number of members in the network, goal consensus, and the need of network level competencies could affect the formation of network structure, not only after the adoption of specific network governance type, but during project implementation, those conditions could change and thus, affect the network structure.

Network tensions

The network addresses both efficiency and inclusiveness, and favors stability more than flexibility. The only exception is for the internal vs external legitimacy tension; 2 out of 3 interviewees answered that the network addresses more internal legitimacy. But as the third interviewee explained, this might somehow be related with the 'age' of the network itself, as IZIT could be considered as 'young' network, they first need to address more internal than external legitimacy. IZIT is now also trying to address external legitimacy by creating new projects related with the government and social workers.

Network evolution

There are changes in the contingency conditions (trust, number of participants, goal consensus and the need of network level competencies), and as agreed by all interviewees, the changes are fluctuating. "Sometimes better, sometimes worse. Sometimes it is one step forward and two steps back. It is always changing because of legislations, national plans, and competitive reasons". During this time, these changes however are not influencing the network structure yet, except for changes in the board member. However, in relation with network evolution, one of the interviewees said that: "To organize things better and to have more progress as a health care provider, we decided to make an exploitation projects (from the project point of view), which is called service center**,** to manage the whole projects, including projects that are already done. But this is another kind of network or a next stage in the network. IZIT is more about innovation, and this service center is more about servicing. IZIT could be replaced, but for now, on lower level, things will go on as they do."

Network effectiveness

There are positive results in all three levels of network effectiveness measurement (community, network and organization/participants levels), in which based on the interviews, the most important party/stakeholder within IZIT network that should get a benefit if the network is effective is the participants, and also community (patients) indirectly.

The interviewees were also asked if an effective network could lead to an effective IS process planning. We observed an agreement among the answers of all interviewees in that if the network is working well, then the project will perform better. However, one of the interviewee stated that it may well be the other way around, if the IS process planning is good, it can support the organizations in working with each other.

IOSISP process

The IOSISP process dimensions within IZIT have been studied before (Mulder, 2007). In this specific part, we use Mulder (2007) interview result to analyze the IOSISP process.

The analysis initiated with comprehensive and complete, but later it is changed to details. All reports were also documented. The members could be appointed by the offer from IZIT but they could also joined by their own willingness. The members should pay a member fee, although there are no strict regulations of becoming a member. On the IT initiation, IZIT is looking for ideas and any needs or solutions in the market and also from the members. They are aiming to develop an infrastructure so that different IS can communicate with each other and enhance the IT use. The network decisions are taken by the board member that is called icZt. The representatives from each member were selected to participate in the board. They have a regular meeting and the board also gets together regularly.

IOSISP effectiveness

With the adoption of NAO governance within IZIT, all interviewees agreed that it helps align the hospitals and other members' goal with the overall network goal. They are now also better off in preparing possible plans in the future, and although it is going quite slow, IZIT governance is leading to a better mutual cooperation between members.

Moreover, all interviewees have an agreement that the knowledge of network contexts (trust, goal consensus, participants' conditions, and also the need of network level competencies) could lead to a better management of the project.

From the interviews, we got some other conditions (aside from what Provan & Kenis (2007) mentioned in their propositions of network context and tension) that based on interviewees' experiences could affect the network, those are: (i) the mixture of different type or member's diversity, (ii) size and complexity of member, (iii) profit for members, (iv) external conditions or society such as legislation, economic or financial situations (crisis) and (v) cultural tensions among members.

5.2. D!MPACT

Within D!MPACT case study, a total number of 2 interviews were conducted within a time period of a month. The selection of the interviewees is based on their knowledge of the overall project. The interviewees are in the level of director and project manager. The interviews took place at the interviewee's office. The approximate time of each interview is around 1 – 1.5 hour.

Below we present the results of each main point of the interview scheme:

Network governance type

"D!MPACT is like a cooperative club, so it is managed like a club. The members come together and they have the power. They chose the council to control the network. The municipalities are the owner of D!MPACT, they made the year plan and this plan is done by the director of D!MPACT".

There are 14 members in the network. The trust among them is very high, and all members were in agreement and decided to follow the collective goal, which is to create software that is flexible enough for their own local municipality character but also more or less standard from the point of view of all municipalities. All members need to collaborate with each other, get together, share experiences and learn from one another how they can work locally. Within D!MPACT network, there are not much issues of external demands such as the need of seeking out new members, acquiring funding, building external legitimacy, etc.

With regard to the number and size of participants in the network, beside number of participants, here within D!MPACT case, as in IZIT case, the size and complexity of participants also has more influence in the network. "The size of participant has more influence; the huge municipalities have more influence in the network". Moreover, the experience of participant also has influence especially in the leadership role within the network, as said by one of the interviewees that there is one member that has more influence in the network because they have more experiences in that type of system among all. So they knew what they want, and they make a step forward and let other municipalities take the advantage.

As in IZIT case, here within D!MPACT there was also an agreement among interviewees that the knowledge of network context such as trust among network members, number of members in the

network, goal consensus, and the need of network level competencies could affect the formation of network structure, not only after the adoption of specific network governance type, but during project implementation, those conditions could change and thus, affect the network structure.

Network tensions

First, the network needs more inclusiveness; “Inclusiveness is more important. The efficiency was put in the goal of the whole project, but from the organizational point of view, inclusiveness is very important”, as one of the interviewees stated. For the tension between stability and flexibility, one interviewee stated “Stability is needed, but the D!MPACT should be also flexible”. The other stated “Stability was much more important. To be successful in the eyes of community, they have to be stable. On short term, flexibility was also important, but for the long term, stability should be more important.” The last tension about addressing external or internal legitimacy, one interviewee mentioned “More internal, because we look for new municipalities”, and the other said “Both internal and external, but in the end, the external legitimacy could be more addressed than internal, because they wanted to spread this system to all municipalities in the Netherlands and they also motivated by the government”.

Network evolution

During projects implementation, there are changes in the contingency condition in a positive way. “Because now the application is live and used by the citizens, it increases the belief from the members. The general goals remain the same. The number of participants increases. And if you work together, the need for network level competencies should increase”. During this time, these changes however are not influencing the network structure yet, but if there are more members, the network would be restructured, as one of the interviewees said “We think if we get more than 20 participants, we will restructure the organization. Now we have flat organization, every member can just join, but then we need to support the region. We need to have D!MPACT affiliation in each specific region”.

Network effectiveness

The most important party/stakeholder within D!MPACT network that should get a benefit from an effective network is the community (in this case is citizens) and also the participants (municipalities and other parties involved). The questions of network effectiveness give positive results, in all three levels of network effectiveness measurement (community, network and organization/participants levels).

The interviewees were also asked if an effective network could lead to an effective IS process planning. All interviewees also have an agreement in that if the network is working well, the project will perform better.

IOSISP process

D!MPACT did a huge design process in the analysis part. The selection of participating organizations and organizational status of members is quite formal. In the beginning, it was more based on personal connection and enthusiasm, but later when the project was finished, members were formally appointed. Here there is also a kind of member fee, and they have a rule how to be a member and obligation of being a member. In term of IT initiation, D!MPACT is searching for creativity and innovation on IT among members, as their aim is to have a system that integrates all applications needed in the governmental area. All members have an equal voice to make decision or to propose new idea. Representatives were selected

from each organization; most of them were head of their own IT department. They have regular meetings and once they had an agreement, they could share it with their own organization.

IOSISP effectiveness

With the adoption of shared governance within D!MPACT, the interviewees agreed that it helps align especially the municipalities' goal with the overall network goal and it improves the project management. They are now also better off of preparing possible plans in the future, and D!MPACT governance is also leading to a better mutual cooperation among members.

From the interviews, we got another conditions that based on interviewees' experiences could affect the network: the need of urgency or time pressure of the IS application that should be implemented would make members to participate and involve more.

5.3. TRANSUMO

Within TRANSUMO case study, a total number of 2 interviews were conducted within a time period of 7 days. TRANSUMO is a very big organization. In our research, we could not get information from the board of TRANSUMO itself. The interviewees are from the level of project manager and project employee of small parts of the overall projects within TRANSUMO. For each project, there might be many differences in terms of network governance and IS process planning. Thus, for this case study, we could not generalize the findings for all projects within TRANSUMO organization. However, even each project has each different condition, from the network governance perspective, in which one of the important things is its relationship among members or participants in the network, then in the TRANSUMO case, almost all projects that have been implemented, have the same type of relationship among participants in its network; that is vertical relationship with mixture of private and public type of organizations or companies, in which all of them are usually competing with each other.

One of the interviews took place at the interviewee's office and the other is done through a phone interview. The approximate time of each interview is around 1 hour. However, one of the interviewees was involved in a conceptual analysis project, meaning that the network is not there yet. His answers are then more about recommendation of how the network should be based on his experience in his project.

Below we present the results of each main point of the interview scheme:

Network governance type

TRANSUMO is just interested in research, if there are any interests in that research, the parties have to adopt and organize themselves. The parties involved in those projects are both private and public organizations, with their own interests and goals, in which they are competing with each other. Because of these conditions, the projects should be led by one of the most powerful member in the network.

The parties did not trust each other, and were not willing to share too much data and information about the commercial projects that have been done before. Number of participants in each project differs ranging in moderate level. One interviewee explained, "The project is split into research and commercial parts. From the research perspective the goal consensus was clear, from the project perspective the focus or objective was lacking". Other interviewee stated that "They want to work by themselves, but they have interdependency relationship, because their work could affect the others". They also have a problem in seeking out new partners, but there was no problem with funding, as one interviewee explained.

As in the two previous cases, here within TRANSUMO projects there was also an agreement among interviewees that the knowledge of network context such as trust among network members, number of members in the network, goal consensus, and the need of network level competencies could affect the formation of network structure, not only after the adoption of specific network governance type, but during project implementation, those conditions could change and thus, affect the network structure.

Network tensions

As in D!MPACT case, there is no absolute agreement among interviewees answer. For tension between efficiency and inclusiveness, one interviewee said that "Both are important. They want to gain efficiency, but to gain efficiency, we need member involvement or participation". The other interviewee said the network needs more inclusiveness. Next, for tension between addressing more internal or external legitimacy, both interviewees stated differently, one said more internal, the other said more external. For the last tension, one interviewee stated that again, both are important, and the other interviewee said that the network needs more stability.

Network evolution

The network contexts such as trust, number of participants, goal consensus and the need of network level competencies however are changed during project implementation, as one of the interviewees stated; "At some points it was going down, but then it is going a little bit better". Until now, TRANSUMO survives in the network, and with regard to network evolution, as one interviewee explained, TRANSUMO is now trying to make an extension to a new model, more like a continuation, because TRANSUMO project will be ended in 2009 but there are still couple of initiation projects that could be researched and implemented.

Network effectiveness

The most important party or stakeholder within TRANSUMO network that should get a benefit if the network is effective is the members or participants.

The interviewees were also asked if an effective network could lead to an effective IS process planning. One interviewee agreed that for sure, and the other interviewee said that "It is the other way around; the effectiveness of the network is depending on the system that we proposed".

In all three levels of network effectiveness measurement (community, network and organization/participants levels), the interviewees give a positive answers in general.

IOSISP process

Within TRANSUMO projects, there were very comprehensive analyses. The projects also attempt to be quite exhaustive in making and integrating strategic decisions, even though one of the interviewee said that "It was good, but I think we could have been done better". There is no organizational status or any kind of member fee, and the participants were appointed by the organization leader in the project. The project's initiation usually comes from and decided by the most powerful member in the network. The planning process also seeks for means to harmonize IT use of different members. There is quite broad perspective participation in term of involvement in planning, and they have quite good consistency in planning activities that is done through knowledge sharing and working group meeting.

IOSISP effectiveness

Several remarks from one of the interviewees about IOSISP effectiveness within the projects are that "TRANSUMO as an organization could be better in organizing in internal things; such as organizing projects meeting, because from the point of view of project management perspective, TRANSUMO was a little bit lacking. They could also do better in knowledge sharing session."

One other remark from the interviewee is supporting what one of the interviewees within IZIT case explained about condition that could affect the network, that is profit or benefit of the participants. The interviewee here specifically stated that "If they all can see the benefit by participating in the network, then they will be interested to participate".

6. CROSS-CASE ANALYSIS AND DISCUSSION

In this section, we explain the analysis of network governance effects on IOSISP effectiveness based on the results from each case study. We use cross-case technique for analyzing this qualitative multi-case studies, which is stated relevant if a case study consists of at least two cases (Yin, 2003). First we describe the interview result with several word tables that display the data from each of the case studies. Each table specifically explains each main point we wanted to analyze, that are network governance type, network tensions, network evolutions, network effectiveness, IOSISP process and IOSISP effectiveness. We observe and then draw a conclusion from the overall pattern in the entire word tables (as presented in Appendix B).

Network governance type

1. IZIT

The finding from the interviews provides support to the first proposition of network governance type by Provan & Kenis (2007) that IZIT confirms NAO type of network governance. The network contexts within IZIT also provide support to the adoption of NAO type of governance.

With regard to what Hong (2002) presents about network role linkage, this NAO type confirms the adoption of both horizontal and vertical relationships, as there are heterogonous members with no specific powerful or large member that takes a leadership role in the network, instead, they use third party (agent), which is IZIT, to act as an administrator in the network.

2. D!MPACT

D!MPACT confirms the shared type of network governance. The network contexts within D!MPACT also provide support to the adoption of shared governance type, except the number of participants that could be assessed as moderate.

This shared network governance type consists of municipalities that have the same objectives in general; this is analogical with the horizontal type of network described by Hong (2002), in which it is explained that horizontal role linkage happens in the network with homogeneous members that share a common role.

3. TRANSUMO

The finding from TRANSUMO projects provides support to the lead organization type of network governance. The network contexts within TRANSUMO projects also provide support to the adoption of lead organization type of governance described by Provan & Kenis (2007).

This also confirms what Provan & Kenis (2007) present before, that lead type of network governance often occurs in vertical relationships (Hong, 2002), in which it happens in the network with heterogeneous members, such us buyer-supplier relationship where there is one powerful company or organization that leads the network.

Based on Provan & Kenis (2007), network contexts such as trust, number of participants and goal consensus, appear to affect the choice of the network structure. However, based on the analysis of the three case studies, all of them did not realize or intentionally use or analyze how the conditions of their

network contexts before creating a network. This is similar with findings from Daft (2001), as explained in Section 2.3. He stated that "Company managers didn't fully understand how the organization related to the environment or how it should function internally". But even they did not consider the network contexts in the formation of their network, the network governance and its context are really exist in practice, only they do not realize that they governed their network based on specific network governance criteria or type. They also do realize the advantages of knowing the network context before hand, meaning before implementing the project or creating a network, as all interviewees stated that those network contexts could affect the formation of network structure, not only after the adoption of the network governance type, but also during project implementation, those conditions could change and thus, affect the network structure. Furthermore, they stated that selecting the correct planning approach with regard to network type or structure leads to increase planning effectiveness.

In the network context, the diversity with regard to type, size and experience of network participants seem to be more important to have an influence in the network than the number of participants. Within D!MPACT case, which adopted shared governance form, the diversity is quite low. Within IZIT case that adopted NAO governance form, the diversity among network participants is in moderate level. And within TRANSUMO case that adopted lead organization form, the diversity is seen to be quite high.

Next, based on the three case studies, each of those industry sectors performs different type of governance (NAO type in health care sector (IZIT), shared type in government sector (D!MPACT) and lead type in transport/logistic sector (TRANSUMO)). However, this research does not conclude that for each of those sectors, they always use exactly the same type of governance. The adoption of network governance type depends more on the diversity of network members and network contexts (as explained by Provan & Kenis, 2007) than the type of industry sector.

The table below summarizes our analysis of the network governance type and its contexts.

Network Governance Form		**Network Context**				
		Trust	**Number of Participants**	**Goal Consensus**	**Need of Network Level Competencies**	**Participants Diversity**
IZIT	**NAO**	Moderate	Moderate to many	Moderate to high	High	Moderate
D!MPACT	**Shared**	High	Moderate	High	Low to moderate	Low
TRANSUMO	**Lead**	Low	Moderate	Low	Low to Moderate	High

Table 6.1. Network Governance and Context

Network tensions

1. IZIT

The tensions within IZIT network also provides support to Provan & Kenis (2007) second proposition of network tensions for NAO type. The exception in the internal vs external legitimacy tension could be explained by the 'age' of the network itself, as a 'young' network, they first need to address more internal then next, external legitimacy. This leads to what Provan & Kenis (2007) proposed that within NAO type of governance, both internal and external legitimacy are addressed in sequential fashion.

2. D!MPACT

The tensions within D!MPACT does not really fit with what Provan & Kenis (2007) propose about tensions within shared governance type. Almost all interviewees stated that the network needs both efficiency and inclusiveness, both flexibility and stability, and first addresses internal then next external legitimacy.

3. TRANSUMO

For the network tensions, the TRANSUMO projects however do not provide support to Provan & Kenis (2007) second proposition about network tensions for lead organization type, instead, they provide more support to the tensions within NAO type of governance.

The differences among interviewees' answers however might happen because of the difference of network status between two projects from the two interviewees. As explained before, the first interviewee comes from the conceptual project, in which the network is not there yet in practice. The other interviewee comes from a project that has been implemented. The first interviewee would say the network needs more internal legitimacy, because the network is not formed yet, thus addressing more internal legitimacy would be more important. On the other hand, the second interviewee said, the network addresses more external legitimacy, because on his project, the network is already there, so addressing external legitimacy would be more important than internal. The different answer on the last tension (flexibility vs stability) could also be explained in similar way. The first interviewee said the network would need more flexibility, because in a newly formed network, a flexible network would help new member to join easily. The second interviewee on the other hand said the network would need more stability, because in this case, the network is already there, and so, it is more important to have a stable network, although flexibility is also important.

From the findings of network tensions from each case study described above, those tensions are there in practice, but specific tensions like efficiency and inclusiveness, based on the interview result, both are difficult to compare because they are somehow complementary to each other, as stated by one of the interviewees, "Network wants to gain efficiency, but to gain efficiency, we need member involvement or participation". The argument works the same way for the other tensions; the flexibility and stability, and internal and external legitimacy. These tensions do not necessarily depend on the adoption of network structure. At first, all networks should address internal legitimacy, and should also be flexible, so it could attract more members to join easily, but in the end, to be able to survive, all kind of networks should also address external legitimacy and stability.

The table below summarizes our analysis of the network governance type and its tensions.

Network Governance Form		Network Tensions			
		Need of Efficiency or Inclusiveness	**Addressing Internal or External Legitimacy**	**Need for Flexibility or Stability**	**Other Tensions**
IZIT	**NAO**	Both efficiency and inclusiveness	Both, first internal, then external	More stability	Cultural tension, legislation and finance
D!MPACT	**Shared**	Both, but more inclusiveness	Internal, then also external	Both, but more stability	Cultural and social tensions
TRANSUMO	**Lead**	Both, but more inclusiveness	Both	Both, but more stability	Conflicting interests and lack of trust among members

Table 6.2. Network Tensions

Network evolution

1. IZIT

Within IZIT network, there are changes in the contingency conditions (trust, number of participants, goal consensus and the need of network level competencies). As agreed by all interviewees, the changes are fluctuating. During this time, these changes however are not influencing the network structure yet, except for changes in the board member.

2. D!MPACT

During projects implementation within D!MPACT network, there are also changes in the contingency condition or network contexts in a positive way. As in IZIT, these changes however are not influencing the network structure either, but if there are more members, the network would be restructured.

3. TRANSUMO

Because the "age" of the project and as stated before, one of the projects is still conceptual, the network evolution is not there yet. The network contexts such as trust, number of participants, goal consensus and the need of network level competencies also changed during projects implementation. For now, TRANSUMO is trying to extend itself into a new model, in order to continue some new initiation project researches.

Those results above explain that the network contexts are always changing and not always leading to positive changes, but it fluctuates between 'up' and 'down' conditions. However, even there are changes in network contexts, the evolution of the network type could not easily be seen in those three case studies. It then could be explained from the point of view of the lifespan of each network; they are ranging from 4 to 6 years network. The networks are now quite in a stable condition. Even though they are expanding their networks, but we could not see the exact changing or evolution from one network structure to the other yet, as what Provan & Kenis (2007) mentioned about network evolution, that "the network is likely

to evolve in a predictable pattern from shared-governance to a more brokered form and from participant governed to externally (NAO) governed".

The table below summarizes our analysis of the network evolution in each case study.

Network Governance Form		Network Evolution	
		Changes in network contexts (trust, number of participants, goal consensus, etc.)	**Changes in network governance**
IZIT	**NAO**	Yes, sometimes better, sometimes worse, always fluctuating	No, except for changes in board members
D!MPACT	**Shared**	Yes, in a positive way	Not yet
TRANSUMO	**Lead**	Yes	Not yet

Table 6.3. Network Evolution

Network effectiveness

We are conscious that there are no exact statements or detail questions in how to define or measure network effectiveness. In this research, for the purpose of network effectiveness measurement, we build questions (see Appendix A, network effectiveness part) from the criteria that are derived from the definition of network effectiveness described by Provan & Milward (2001), which are the three different levels of network effectiveness evaluation, which is also explained before in Section 3.2, Table 3.1.

1. IZIT

The answers (Appendix B – Table B4) from the interviewees explain that IZIT is heading to what Provan & Milward (2001) called an effective network, in all three levels of network effectiveness measurement (community, network and organization/participants levels). The most effective level of measurement however is on the community and organization/participants level. We think this could be explained from a stakeholder point of view, as based on the interviews, the most important party/stakeholder within IZIT network that should get a benefit if the network is effective is the participants, but also community (patients) indirectly.

2. D!MPACT

Based on the interviews, the most important party/stakeholder within D!MPACT network that should get a benefit from an effective network is the community (in this case is citizens) and also the participants (municipalities and other parties involved). This is supported by the answers (Appendix B – Table B4) of the interview questions of network effectiveness, in which it explains that D!MPACT is heading to what Provan & Milward (2001) called an effective network, in all three levels of network effectiveness measurement (community, network and organization/participants levels).

3. TRANSUMO

The network effectiveness assessment in this case is done by asking one of the interviewees who is involved in a project that has been implemented. Within TRANSUMO projects, the most important party that should get a benefit if the network is effective is the members or participants. This is supported by the fact that TRANSUMO gives a positive outcome in all three levels of network effectiveness measurement (community, network and organization/participants levels), especially in the organization/participant and community levels. In the network level analysis however, the result presents that TRANSUMO could and should have been done better in organizing its network.

In relation with connection between network effectiveness and IS process planning effectiveness, there are contradictions among interviewees' answers. On one hand some of them agreed for sure that an effective network could lead to an effective IS process planning, but on the other hand, some of them said the other way around. This difference might be explained by looking at the conditions of those three case studies, specifically looking at the point of view of the existence of the network in the project. In the case that the network is already there before the IS is planned, then the more effective the network would lead to more effective IS process planning. But in the case that the IS is already planned first before the network is built, then the more effective the IS would lead to more effective network, or the effectiveness of the network depends on the IS that they planned or proposed.

The table below summarizes our analysis of the network effectiveness in each case study.

Network Governance Form		**Network Effectiveness**	
		Beneficial party of an effective network	**Most effective network level analysis**
IZIT	**NAO**	Network members and community (patients) indirectly	Organization/participants and Community level
D!MPACT	**Shared**	Community (citizens) and network members (municipalities and other parties involved)	All levels; Community, Network and Organization/participants level
TRANSUMO	**Lead**	Network members	Organization/participants and Community level

Table 6.4. Network Effectiveness

IOSISP process

1. IZIT

The results from Mulder (2007) state that the comprehensiveness process dimension within IZIT case could be measured as medium, as well as the formalization dimension. The process has creative focus, and more top-down flow, broad perspective participation with a high consistency.

2. D!MPACT

Within D!MPACT, the comprehensiveness process dimension could be measured as high, as D!MPACT attempts to be quite exhaustive in making and integrating strategic decisions. The

formalization is in medium level with regard to the selection of participating organizations and organizational status of members. It has creative focus within the process structure in terms of searching for creativity and innovation on IT among members, more bottom-up flow of decision making, broad perspective participation in term of planning involvement, and has medium consistency in terms of planning activities as well as the frequency of evaluation and revision of strategic choices that are done through the continued meetings during project implementation.

3. TRANSUMO

Within TRANSUMO projects, the comprehensiveness process dimension could be measured as medium to high as the projects attempt to be quite exhaustive in making and integrating strategic decisions. The formalization dimension is on medium level, as there is no organizational status or any kind of member fee, and the participants were appointed by the organization leader in the project. However, the projects has more control focus on the process structure, and more top-down flow of decision making, as the initiation usually comes from and decided by the most powerful member in the network. There is broad perspective participation in term of involvement in planning, and they have quite good (medium to high) consistency in terms of planning activities and the frequency of evaluation or revision of strategic choices.

The table below summarizes our analysis of the IOSISP process within each case study.

Network Governance Form		**IOSISP Process**					
		Comprehensiveness	**Formalization**	**Focus**	**Flow**	**Participation**	**Consistency**
IZIT	**NAO**	Medium	Medium – High	Creative	Top down	Broad perspective	High
D!MPACT	**Shared**	High	Medium	Creative	Bottom up	Broad perspective	Medium
TRANSUMO	**Lead**	Medium – High	Medium	Control	Top down	Broad perspective	Medium - High

Table 6.5. IOSISP Process

With regard to what Segars & Grover (1999) propose about profiles of SISP in relation with the IOSISP process dimensions (Section 2.1, Figure 2.4 and 2.5), the three case studies provide support to Profile 5, which exhibits quite strong characteristics of both rationality (comprehensive, formal, control and top-down) and adaptability (broad participation and high consistency), as could be seen in Appendix B, Table B5. The exceptions however occur in the focus dimension within IZIT and D!MPACT cases, and in the flow dimension within D!MPACT case. Instead of being integrative, IZIT and D!MPACT have more creative focus of process dimension, and instead of having top-down flow, D!MPACT has more bottom-up flow. The one that reflects Profile 5 precisely is the TRANSUMO case.

Based on Segars & Grover (1999), Profile 5 supports the Learning school of thought. In this Learning school, “the task of strategic planning is viewed as a process of creating, acquiring and transferring knowledge for the purpose of modifying IT-based initiatives such that they reflect new knowledge and insights”. This could be seen from the broad perspective participation or planning involvement from

network members and high consistency of planning activities and the frequency of evaluation or revision of strategic choices, from those three case studies. The formalization dimension from those case studies also supports the core belief within the Learning school; “strategy emerges as a result of formal and continuous reconciliation of ongoing initiatives throughout the organization and associated opportunities within the competitive context”. In this Learning school, written documentation, formal presentations and standardized training are usually used to create strategic knowledge. This could also be seen from the comprehensiveness of analyses and reports in each case study. In TRANSUMO case it is specifically stated that there were some kind of knowledge sharing session in which all kind parties from outside can see what is happening in the projects.

TRANSUMO seems to support this Learning school. However, the case study mentions that they should and could have been done better in organizing the network, including the IS process planning. IZIT and D!MPACT on the other hand, do not precisely support the Learning school, as they present more creative than integrative focus in terms of new joint initiatives and IT standardization, and one case study has more bottom-up decisions flow than top-down.

IOSISP effectiveness

1. IZIT

The four IOSISP effectiveness criteria (alignment, analysis, cooperation and improvement in capabilities) are assessed, and based on the interviewees’ answers, the NAO governance type adopted by IZIT leads to an effective IOSISP.

The alignment criteria could be assessed as good, as with the adoption of NAO governance within IZIT, all interviewees agreed that it helps align the hospitals and other members’ goal with the overall network goal. They also present good analysis, as they are now also better off in preparing possible plans in the future, and for the cooperation criteria, IZIT governance is leading to a better mutual cooperation between members. There is also an improvement in capabilities, as all interviewees have an agreement that the knowledge of network contexts (trust, goal consensus, participants’ conditions, and also the need of network level competencies) could lead to a better management of the project, even though it is not easy to achieve, as explained by one interviewee, “In planning and implementing IS, there are always tensions in the network, and planning is very hard to do because there are a lot of external reasons, and the only possible steps are very small steps”.

2. D!MPACT

Similar with IZIT’s result, the shared governance type adopted by D!MPACT seems to lead to an effective IOSISP. The alignment is good, because with the adoption of shared governance within D!MPACT, all interviewees agreed that it helps align especially the municipalities’ goal with the overall network goal. In the analysis dimension, there is also an improvement in term of better project management. There is an improvement in their capabilities as they are now better off in preparing possible plans in the future. And for the cooperation dimension, D!MPACT governance is also leading to a better mutual cooperation among members.

3. TRANSUMO

There are several remarks from the interviewees with regard to its adoption of the lead organization type, especially in the analysis dimension; TRANSUMO has to be better in organizing internal things such as knowledge sharing session. The alignment dimension could also be assessed as good, even though they could have done and could do better. However, the governance of TRANSUMO seems to lead to a better mutual cooperation among members and it helps to learn how to do things better, such as how to do better management project if they are working on project that includes both research and commercial projects, as happens in most TRANSUMO projects.

The table below summarizes our analysis of the IOSISP effectiveness within each case study.

Network Governance Form		**IOSISP Effectiveness**			
		Alignment	**Analysis**	**Cooperation**	**Improvement in Capabilities**
IZIT	**NAO**	Good	Good	Very slow, but good	Good
D!MPACT	**Shared**	Good	Good	Good	Good
TRANSUMO	**Lead**	Good, but could do better	Could have done better	Good	Good

Table 6.6. IOSISP Effectiveness

Based on Segars & Grover (1999), Profile 5, which adopted Learning school and Organizational approach, is the most effective planning profile across all four effectiveness dimensions. As explained before, almost all criteria assessed within the three case studies provide support to Profile 5. This is in line with the interview result of IOSISP effectiveness of the three case studies, in which in all three cases, their IOSISP effectiveness is analyzed to be leading to a network with an effective IOSISP. These findings in general provide support to what Segars & Grover (1999) propose that the Learning school leads to the effective planning process. However, as we did not discover any other type of school of thoughts from our case studies other than the Learning school, we could not conclude that the Learning school with its Organizational approach is the most effective among all other school of thoughts described by Mintzberg (1990).

Salmela & Spil (2006) tries to position the five planning schools of thought (Mintzberg, 1990) and the five SISP approaches (Earl, 1993) in the network coordination mechanisms. They propose that in hierarchic network, the SISP approach should be Design school with Business-Led approach, Planning school with Technological approach, or Positioning school with Method-Driven approach. In relational network, the SISP approach should be the Learning school with Organizational approach. And in contractual network, the SISP approach should be the Political school with Administrative approach. This is somehow different with what we observed from our case studies. As presented before, even though two case studies do not precisely follow the Learning school, all of them are heading to it, regardless their type of network structure.

From the analysis of the case studies, we constructed validity that the use of network governance proposed by Provan & Kenis (2007) affects the network and its IOSISP outcome positively. The network structures are there in practice, also its contexts, tensions and evolutions. The knowledge of network context such as trust among network members, number of members in the network, goal consensus, and the need of network level competencies could affect the formation of network structure, not only after the adoption of specific network governance type, but during project implementation, those conditions could change and thus, affect the network structure. Moreover, member's diversity (heterogeneity) in terms of size, power and experience also has important influence to the network structure.

The conclusion of the positive impact of network effectiveness to the IOSISP effectiveness is derived from the answer of the question that an effective network could lead to an effective IS process planning. But several interviewees also said the other way around, an effective IS process planning could lead to an effective network. We then conclude that it depends on the starting condition of the network: Within IZIT and D!MPACT, they formed the network first, then plan the IS. Some projects within TRANSUMO case on the other hand, planned or built the IS first, then form the network; in this case, the more effective the IS, the more effective the network that is going to be formed. After all, these two things (network and IS planning) are still interacting and affecting one another continuously, thus also explains the dynamicity of an IOSISP in network perspective. What we could conclude from this finding is that network effectiveness has a positive relation with IOSISP effectiveness. The evaluation of IOSISP then could not be separated from the evaluation of its network. Thus, the overall IOS collaboration outcome should be evaluated by analyzing the effectiveness of IOSISP as well as the effectiveness of network where it is implemented.

All in all, the analysis from the case studies confirms the theoretical model depicted in Figure 3.4. In Section 3.4, we mention that network context could be provided by or related with Resources (inputs); business goals and plans, trust, IOSISP planning goals, etc, and External environment (e.g. environmental shocks such as shifts in funding or new regulations, legislation, economic situations (crisis), etc). Aside from External environment and Resources, Nature of IOS is found to be also providing input to the Network contexts within (Inter) organizational environment. As explained before, from the interviews we found out that how the IOS application is planned; how beneficial or urgent the IS application is, which has a relation with the strategic importance of IS that is defined by Van den Broek et al. (2008) as the Nature of IOS, should then also be considered as factor that could affect network structure through its contingency conditions or network contexts. This then explains the interaction and positive relation among contextual factors described by Van den Broek et al. (2008).

The relation between network governance and IOSISP effectiveness in the IOS collaboration context then could be updated and presented in a new model as depicted in the figure below:

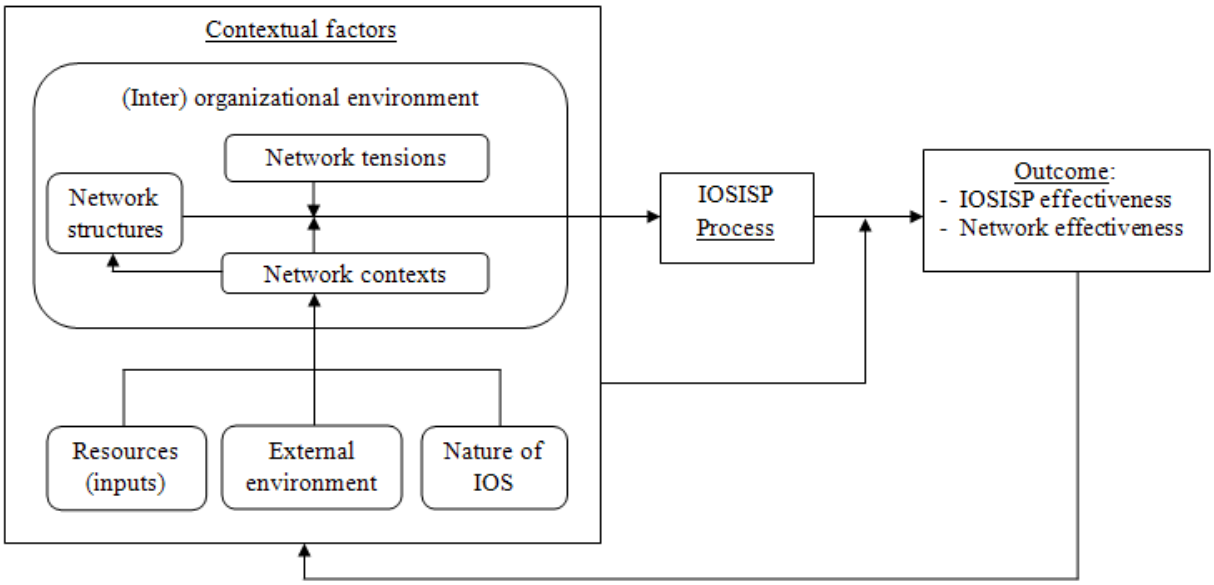

Figure 6.1. Conceptual network effectiveness model in the IOSISP context

We do not restrict the findings that other relations; that are not mentioned in the figure above, might also exist, but those are beyond our research. What we could conclude based on the result of our study is depicted in Figure 6.1 above.

Next, our discussion goes to the dynamicity of IOS collaboration process. Based on theoretical explanation of the process framework of the development of cooperative IORs (Ring & Van de Ven, 1994), we then propose to relate this framework with findings from Provan & Kenis (2007) and Van den Broek et al (2008) to explain the dynamicity of IOSISP.

Ring & Van de Ven (1994) on their research examine the developmental process of cooperative inter-organizational relationships (IORs). An IOR is defined by Van de Ven (1976) as "a social action system on the premise that it exhibits the basic elements of any organized form of collective behavior", including strategic alliances, partnerships, coalitions, joint ventures, franchises, research consortia and various forms of network organizations (Ring & Van de Ven, 1994; Salmivalli et al., 2008). Ring & Van de Ven (1994) propose a theoretical framework that draws from the research tradition of inter-organizational systems (IOS). Based on their work, we argue that the dynamicity of this IOSISP process could follows that framework and could be explained by combining the framework they propose with the adapted research framework of IOSISP context we propose in Figure 3.4 before.

The original framework described by Ring & Van de Ven (1994) is depicted below:

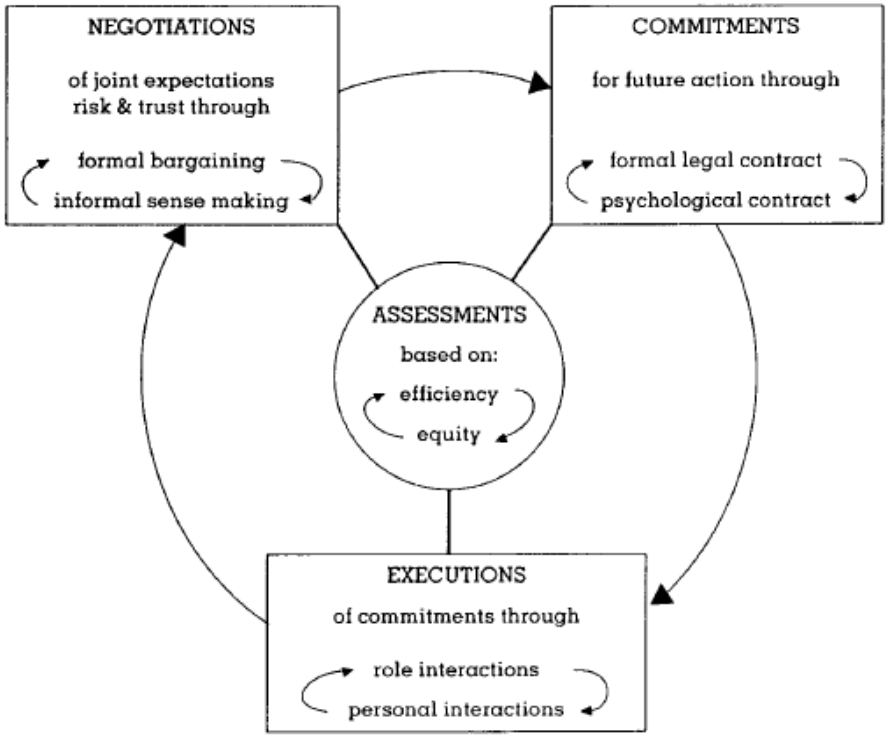

Figure 6.2. Process Framework of the Development of Cooperative IORs (Ring & Van de Ven, 1994)

They explain that the development and evolution of IOR consists of a repetitive sequence of negotiation, commitment, and execution stages, each of which is assessed in terms of efficiency and equity. They describe each of the stage specifically as stated below:

> "In the negotiations stage, the parties develop joint (not individual) expectations about their motivations, possible investments, and perceived uncertainties of a business deal that they are exploring to undertake jointly. In this stage the focus is on the formal bargaining processes and choices behavior of parties as they select, approach, or avoid alternative parties and as they persuade, argue and haggle over possible terms and procedures of a potential relationship. Repeated efforts at negotiations through formal bargaining and informal sense making processes are often necessary in order to provide participants opportunities to assess uncertainty associated with the deals, the nature of each other's role, the other's trustworthiness, their rights and duties in the transactions being considered, and possible efficiency and equity of the transaction as it relates to all parties. In the commitments stage, they reach an agreement on the obligations and rules for future action in the relationship. At this point, the terms and governance structure of the relationship are established. In the executions stage, the commitments and rules of action are carried into effect; the parties administer whatever is needed to execute the agreement." (Ring & Van de Ven, 1994).

First we propose to place some of the contextual factors described by Van den Broek et al. (2008); external environment, nature of IOS and resources (input), and the network context (trust, number of participants, goal consensus and the need of network level competencies) in the negotiations stage. As stated before, the adoption of governance structure is placed in the commitments stage. Next, the IOSISP process will be placed in the executions stage. Here the network tensions are also placed. And finally, the IOSISP outcome or effectiveness is assessed or measured in the assessment stage. The dynamicity of this framework could be seen from the arrows, especially from the executions stage to the negotiations stage that would also affect the commitments stage (the establishment of network governance), which explain the evolution of the network governance.

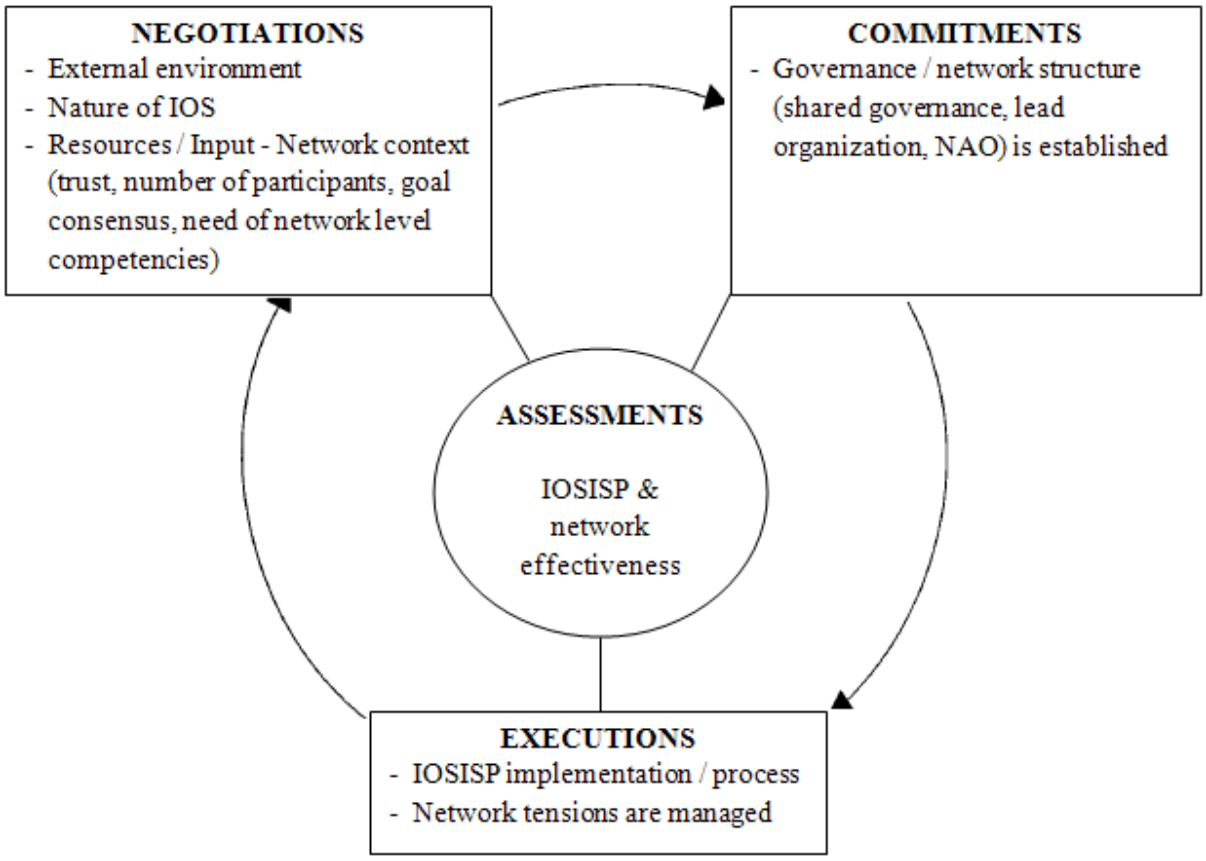

Figure 6.3. Adapted Process Framework of the Development of Cooperative IORs in the Dynamic IOSISP Process

As could be seen from the figure above, the dynamicity explains that the assessment of the IOSISP effectiveness could or should be done not only in the end of the IOS collaboration project, but also continuously during the implementation process. It also explains that in any stage of the process framework, we should consider and aware of network governance with its contingency conditions and tensions that should also be assessed continuously.

The proposed conceptual network effectiveness model in the IOSISP context depicted before in Figure 6.1 then could be explained in more dynamic way with this framework (Figure 6.3).

7. CONCLUSIONS AND FUTURE WORKS

7.1. Conclusions

Real case examples of IOS implementation were already described in Section 1.1. We believe that such issues could be covered using the model we proposed. The awareness of the kind of governance form in the network, how to manage the network based on its contingency conditions, will lead to an effective IOS collaboration and prevent from unwanted implementation issues in the inter-organizational context.

The network evolution, which is the result of changes in the network contexts (such as trust, number and size of participants, goal consensus and the need of network level competencies), is seen to be always changing, as the network contexts are always "going up and down"; sometimes better, sometimes worse; sometimes one step forward and two steps back. This then explains the dynamicity of IOS collaboration process.

The use of SISP frameworks and methodologies to achieve better IS planning have already been developed previously. In this research, we study the IOSISP from the network perspective; investigating the effects of organizational governance and contexts. The network governance here does not stand alone to be called a method to be used directly as a tool in order to achieve an effective IS planning, because network governance can not be separated from IS planning process itself. It means that the knowledge of network governance takes important part of the successfulness of IS planning process.

Consistent with a study of Wang & Tai (2003), we propose that network governance and its organizational contexts can positively affect the effectiveness of IOSISP indirectly through the mediating effects of the IS planning process dimensions.

As explained before, based on Miles & Huberman (1994), cross-case analysis consists of variable-oriented (focusing vertically) and case-oriented (focusing horizontally). In this research, we focus on both strategies: on each of the network governance variables; as presented in Section 5 in each case study findings, and as we did multi-case studies, we also focus on the three different cases; as presented in Section 6. By using both focuses, we believe that we enhance the reliability of our proposed model.

7.2. Theoretical and Practical Contributions

7.2.1. Theoretical Contributions

The main theoretical contribution from our research was to increase understanding of network governance in IOSISP implementation in specific industry sectors; the health care, government and logistic/transport industry sectors, which listed as follows:

1. Our first theoretical contribution lies on the proposed conceptual model depicted in Figure 6.1. We propose that the awareness of network governance in the beginning of the network creation would in the end lead to a successful IOSISP or IOS collaboration in general. However, in relation with the Learning school of thought explained by Mintzberg (1990), the idea of network governance should not only be used as a part of a deliberate strategy (Mintzberg & Waters, 1985) that is planned in the beginning of network creation, but it also has to be continuously planned and assessed as it would also emerge over time, leads to the dynamicity and network evolution, which is presented in Figure 6.3.

2. Next, in all three industry sectors, the network formation and its maintenance and outcome assessment appear to have similarities with the process framework presented by Ring & Van de Ven (1994). Our theoretical contribution also lies on the analysis of adapted process framework of the development of cooperative IORs in the dynamic IOSISP process presented in Section 6, Figure 6.3.
3. The knowledge of network governance could also be considered to theoretically complement or improve the existing SISP methodologies such as BSP (Business Systems Planning), SSP (Strategic Systems Planning) and IE (Information Engineering), as explained by Lederer & Sethi (1988).

7.2.2. Practical Contributions

The practical contributions from our research are described as follows:

1. Much previous research efforts on network governance focus on one specific industry sector (Salmivalli, 2008) or a type of network (Moynihan, 2009). To the best of our knowledge, there is no previously published cross-industry and cross-network study on network governance. The execution of three case studies, each in a specific industry sector with a specific type of network governance, as well as the lessons we learnt from the case studies represent our practical contribution from this research.
2. The conceptual model we proposed could be used to help especially for the managerial group who is planning to build inter-organizational system, to prepare the underlying collaboration between participants, which is very critical for the successfulness of the project. First, the awareness of network contexts should be considered in the beginning of network creation. Simultaneously, they should also aware of the changes of those contexts, as well as the network tensions and evolution that could take place during project implementation. Next, each dimension of IOSISP process and effectiveness should also be considered in order to attain a successful IOS collaboration projects. The IOSISP process and effectiveness could be operationalized through some criteria we used in our interview questions.

7.3. Future Works

There are few ideas which were not fully exploited in our master project that form an action plan for the future research:

1. As already explained in Section 2.2.1, according to Rodriguez (2007), mandated collaboration has not taken into account during the development of studies about inter-organizational collaboration. We proposed that reasons of the collaboration might be another contingency condition that can be added and examined in the next researches. Moreover, other contingency condition that we proposed; the network participant's diversity (Table 6.1), should be validated in more case studies to see whether that could also be added in the network context part.
2. The measurement of network effectiveness on the three different levels (community, network and organization/participant) could be done more accurately by interviewing relevant stakeholders for each level of analysis. A further research specifically on this network effectiveness part and its relation with IOSISP effectiveness could be done for the continuation of this research.

3. Further research and validation could also be done in the process framework of the development of cooperative IORs (Ring & Van de Ven, 1994) that is adapted in our research (Figure 6.3) to explain how network should be in more dynamic way.
4. The division of the three network structures described by Provan & Kenis (2007) could be studied further to see whether there are other types or structures exist in practice.
5. The proposed model might also be validated outside the three industry sectors we used, to see whether it could be used wherever knowledge of network governance is required, regardless the network collaboration reason (outside IT-based collaboration) and kind of industry sector.
6. Lastly, the scope of this research was quite wide. We studied network governance, network effectiveness, and also all three parts of the IOSISP model; the contextual factors, IOSISP process and effectiveness in one research. We could only manage to get the results from relatively small numbers of interviewees from each case study. Thus, a more focus research on each of those parts could be done to achieve more detail and accurate results.

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APPENDIX A: Interview Questions

Introduction

1. What is your name and current job title?
2. In what projects and roles have you been involved?
3. Could you describe the project(s) from your point of view / roles?

Contingency conditions:

Initial conditions

Trust

4. How is the level of trust among those organizations in the network? (low / moderate / high)

Number of participants

5. How many organizations participate in the network? (few / moderate / many)
6. What kind of organizations or companies are they? (public/private, hospitals, buyers, suppliers, etc)
7. How about the size and complexity of each of the organization in the network? (small / medium / large)
8. In your opinion, is it number of participants or the size and complexity of each participant in the network that affect the project mechanism?

Goal consensus

9. How is the goal consensus on their collaboration or goal similarity (do they all have the same goals) of each organization involved in the network? (low / moderate / high)

Need for network level competencies

10. What about the need for network level-competencies in the network? (low / moderate / high)

The need of network level competencies could be defined with:

   a. What is the nature of the task being performed by network members? Does that require significant interdependence among members?
   b. What external demands and needs are being faced by the network? (the roles of buffering, or protecting the network from environmental shocks such as shifts in funding or new regulations, and bridging, which might include the roles of lobbying, seeking out new members, acquiring funding, building external legitimacy, etc)

11. Do these contingency conditions (trust, number/size of participants, goal consensus and the need of network level competencies) somehow affect the adoption of network governance structure? Or IZIT/D!MPACT/TRANSUMO was formed without any considerations of those conditions before?

Form of network governance

12. How were the organizations (in the networks) formed? (widely shared / coordinated by single member / coordinated by external party (IZIT/D!MPACT/TRANSUMO))
13. How do the parties contribute in the network? (widely shared / coordinated by single member / coordinated by external party (IZIT/D!MPACT/TRANSUMO))
14. Was there equality among the partners with respect to size, power, trust, effort, cost and benefit? (widely shared / coordinated by single member / coordinated by external party (IZIT/D!MPACT/TRANSUMO))
15. Who made the decisions or decided what actions to undertake? And who was taking the leadership role? How much did all parties influence these decisions? (widely shared / coordinated by single member / coordinated by external party (IZIT/D!MPACT/TRANSUMO))

Network Evolution:

Final conditions

- Are these contingency conditions have changed during the project? How and why?

16. Trust?
17. Number of participants? The size of participants?
18. Goal consensus?
19. The need of network-level competencies?
20. If any, did these changes of conditions (trust, number/size of participants, goal consensus and the need of network level competencies) affect the overall network (IZIT/D!MPACT/TRANSUMO) structure?
21. In the final conditions of those contingency conditions, if there were changes, did these changes of contingency conditions (trust, number/size of participants, goal consensus and the need of network level competencies) somehow cause any changes of the adoption of network structure?

- Network Type/Structure *(changes on the network type: e.g. from shared -> lead -> NAO?)*

22. Were there any changes in the network structure?
23. What were the reasons of those changes?
24. If any, what are the impacts of those changes and how did it affect the overall IZIT/D!MPACT/TRANSUMO project?

Network tensions *(based on Provan's second proposition)*

Based on adopted governance form (NAO for IZIT case, shared-governance for D!MPACT case and lead-organization for TRANSUMO case), during the IOSISP implementation process:

25. Does the network need efficiency or inclusiveness?
    Efficiency: efficiency comes as a desired outcome in the collaboration of organizations in the network.
    Inclusiveness: the need for member involvement which is done through an inclusive decision making.
26. Is the network addressing internal or external legitimacy?
    Internal legitimacy: focus on the needs of network or organizational stakeholders such as clients, employees and board members.
    External legitimacy: the need of attracting customers, dealing with any other external entities such as government, etc.
27. Do they need more flexibility or stability in the network?
    Flexibility: flexibility allows networked organizations to respond quickly to competition and other environmental threats, as well as to opportunities.
    Stability: stability is critical for maintaining legitimacy, both inside and outside the network.
28. Are there any other tensions arise during the project?

Network effectiveness

Principals: who monitor and fund the network and its activities.
Agents: who work in the network both as administrators and service-level professionals.
Clients: who actually receive the services provided by the network.

Levels of network analysis	Key stakeholder groups	Effectiveness criteria
Community	Principals and clients: - Client advocacy groups - Funders - Politicians - Regulators - General public	- *Cost to community* Does IZIT/D!MPACT/TRANSUMO increase the population of clients being served and reduce the overall costs of treatment and service for those clients? - *Building social capital* Does IZIT/D!MPACT/TRANSUMO strengthen the connections within and between organizations in the network? - *Public perceptions that problem is being solved* Does IZIT/D!MPACT/TRANSUMO increase the perceptions that problem is being solved among the organizations in the network? - *Changes in the incidence of the problem* With IZIT/D!MPACT/TRANSUMO, does it make any changes in the incidence of the problem? - *Aggregate indicators of client well-being* Does IZIT/D!MPACT/TRANSUMO increase client well-being?
Network	Principals and agents: - Primary funders and regulators - NAO - Member organizations	- *Network membership growth* Does IZIT/D!MPACT/TRANSUMO attract more members to join? - *Range of services provided* Are there more services that are actually needed by clients provided with the existence of IZIT/D!MPACT/TRANSUMO? - *Absence of service duplication (scale benefits)* Does IZIT/D!MPACT/TRANSUMO reduce service duplication in the project? - *Relationship strength (multiplexity)* Does IZIT/D!MPACT/TRANSUMO increase relationship strength in the network? - *Creation and maintenance of NAO* Is IZIT/D!MPACT/TRANSUMO able to broaden their services domains whilst still could maintain its network? - *Integration/coordination of services* Does IZIT/D!MPACT/TRANSUMO increase integration/coordination of

		services in the project? - *Cost of network maintenance* Does IZIT/D!MPACT/TRANSUMO reduce the cost of network maintenance? - *Member commitment to network goals* Does IZIT/D!MPACT/TRANSUMO increase member commitment to network goals?
Organization /Participant	Agents and clients: - Member agency board and management - Agency staff - Individual clients	- *Agency survival* Does IZIT/D!MPACT/TRANSUMO survive in the network? - *Enhanced legitimacy* Does IZIT/D!MPACT/TRANSUMO enhance organizations/members legitimacy involved the network? - *Resource acquisition* Does IZIT/D!MPACT/TRANSUMO increase its member's resource acquisition? - *Cost of services* Does IZIT/D!MPACT/TRANSUMO reduce cost of its member's services? - *Service access* Does IZIT/D!MPACT/TRANSUMO increase service access? - *Client outcomes* Can clients receive a broad range of needed and coordinated services offered by IZIT/D!MPACT/TRANSUMO? - *Minimum conflict for multiprogram agencies across multiple networks* Does IZIT/D!MPACT/TRANSUMO reduce conflict across networks?

29. Which one do you think is the most important party to get the benefit from an effective network? (*IZIT*/*D!MPACT/TRANSUMO/members/citizens/government/funders/….*)
30. Do you think that an effective network could lead to an effective IS process planning?

Process Dimensions

Comprehensiveness (low / medium / high)

Definition: The extent to which an organization attempts to be exhaustive or inclusive in making and integrating strategic decisions.

31. What kinds of analyses were made before and during the planning process?
32. How comprehensive was the resulting strategy document (number of pages, content i.e. issues addressed)?

Formalization (low / medium / high)
Definition: Existence of structures, techniques, written procedures and policies that guide to the planning process.
33. How were the participating organizations selected? Were they formally appointed?
34. What was the organizational status of members (decision maker or analyst) – should they pay any member fee, how much, and are there any strict regulations of becoming a member?
35. What other arrangements were made to emphasize the formal status of the planning committee – is there any obligation for the planning committee to report to the board, was the planning team officially / formally appointed, etc?

Focus (creative / control oriented)
Definition: Balance between creativity and control orientations inherent within the process structure.
36. Did the planning committee search for creativity or innovation on IT among members?
37. Did the planning process seek for means to harmonize IT use of different members/parties?

Participation (broad / narrow participation)
Definition: The breadth of involvement in planning; e.g. number of planners involved, representation from various functional areas.
38. How were the representatives of each member selected – how many representations per member?
39. How did the representatives coordinate with their own organization?

Consistency (low / medium / high)
Definition: The frequency of planning activities or cycles as well as the frequency of evaluation/revision of strategic choices.
40. How many times did the members meet?
41. Have the committee continued meetings?

IOSISP effectiveness
(Did the network governance lead to an effective IOSISP?)

Alignment
42. With the existence of IZIT/D!MPACT/TRANSUMO, did the members goal align with the network goal?
43. Did the network governance (IZIT/D!MPACT/TRANSUMO) lead to concrete plans or objectives in the network (did it meet the goals)?

Analysis
44. Did the knowledge of network contexts (trust, number/size of participants, goal consensus, and the need of network level competencies) and network tensions lead to a better organization or management of the project?
45. Did the network governance (IZIT/D!MPACT/TRANSUMO) lead to a better structure/architecture in order to organize or manage the whole network, thus also lead to a better understanding of business processes, procedures and technologies?

Cooperation
46. With the network governance of IZIT/D!MPACT/TRANSUMO, how strong is the commitment to implementing the plan recommendations? Do you believe that the network strategy recommendations will be implemented?
47. Did the project lead to better mutual cooperation?

Improvement in Capabilities

48. With the network governance of IZIT/D!MPACT/TRANSUMO, are you better off in preparing possible plans in the future?
49. How did the network governance IZIT/D!MPACT/TRANSUMO affect / improve the planning process?

Others

50. What are other contingency conditions that might be useful to be considered in the project? (conditions that are likely to affect the formation of the network, e.g. participant's commitment, environmental forces, etc).

APPENDIX B: Concept-based matrices of case analysis

Table B.1. Network Governance Forms and Contexts

	IZIT (Healthcare Sector)	**D!MPACT (Government Sector)**	**TRANSUMO (Logistic/Transport Sector)**
Network Governance Form	NAO	Shared	Lead organization
Trust	Moderate	High	Low
Number of Participants	Moderate to many	Moderate	Moderate
Goal Consensus	Moderate to high	High	Low
Need for Network Level Competencies	High	Low to moderate	Low to Moderate

Table B.2. Network Tensions

	IZIT (Healthcare Sector)	**D!MPACT (Government Sector)**	**TRANSUMO (Logistic/Transport Sector)**
Need of Efficiency or Inclusiveness	Both efficiency and inclusiveness	Both, but more inclusiveness	Both, but more inclusiveness
Addressing Internal or External Legitimacy	Both, first internal, then external	Internal, then also external	Both
Need for Flexibility or Stability	More stability	Both, but more stability	Both, but more stability
Other Tensions	Cultural tension, legislation and finance	Cultural and social tensions	Conflicting interests and lack of trust among members

Table B.3. Network Evolution

	IZIT (Healthcare Sector)	**D!MPACT (Government Sector)**	**TRANSUMO (Logistic/Transport Sector)**
Changes in network contexts (trust, number of participants, goal consensus, etc.)	Yes, sometimes better, sometimes worse, always fluctuating	Yes, in a positive way	Yes
Influence to the network structure	Yes	Yes	Yes
Changes in network governance	No, except for changes in board members	Not yet	Not yet

Table B.4. Network Effectiveness

	IZIT (Healthcare Sector)	**D!MPACT (Government Sector)**	**TRANSUMO (Logistic/Transport Sector)**
Community Level			
Cost to community: Does IZIT/D!MPACT/TRANSUMO increase the population of clients being served and reduce the overall costs of treatment and service for those clients?	Yes, IZIT tries to serve more health care organizations.	Yes.	TRANSUMO tries to, that was the aim of the researches.
Building social capital: Does IZIT/D!MPACT/TRANSUMO strengthen the connections within and between organizations in the network?	Yes.	Yes.	Yes, TRANSUMO has a good influence.
Public perceptions that problem is being solved: Does IZIT/D!MPACT/TRANSUMO increase the perceptions that problem is being solved among the organizations in the network?	That is the intention.	Yes.	TRANSUMO has a good influence
Changes in the incidence of the problem: With IZIT/D!MPACT/TRANSUMO, does it make any changes in the	There are always new problems and there are also problems that being solved, so it's very	D!MPACT solved problems, but there are also new ICT problems	Should be less problems.

incidence of the problem?	dynamic.	arise.	
Aggregate indicators of client well-being: Does IZIT/D!MPACT/TRANSUMO increase client well-being?	Yes, IZIT intends to.	Maybe. But the new system indeed tries to help municipalities.	Yes.
Network Level			
Network membership growth: Does IZIT/D!MPACT/TRANSUMO attract more members to join?	Yes and no. IZIT got new members, but also lose members, although not many. And the IZIT's focus is at the region and most stakeholders are already participating.	Yes.	Yes, after the project was started, TRANSUMO did very well; they organized all kind of knowledge sharing sessions in which all kind parties from outside can see what see what's happening in all projects.
Range of services provided: Are there more services that are actually needed by clients provided with the existence of IZIT/D!MPACT/TRANSUMO?	Yes.	Yes.	Yes.
Absence of service duplication (scale benefits): Does IZIT/D!MPACT/TRANSUMO reduce service duplication in the project?	Yes. e.g. by establishing e-transfer record, they are trying to stop all the double paper works and stuffs like that.	Yes.	Yes.
Relationship strength (multiplexity): Does IZIT/D!MPACT/TRANSUMO increase relationship strength in the network?	Yes.	Yes.	TRANSUMO tries to.
Creation and maintenance of NAO: Is IZIT/D!MPACT/TRANSUMO able to broaden their services domains whilst still could maintain its network?	Yes, they are trying to.	Yes.	Yes.
Integration/coordination of services: Does IZIT/D!MPACT/TRANSUMO increase integration/coordination of services in the project?	Yes.	Yes.	That was the aim of the researches within TRANSUMO.

Cost of network maintenance: Does IZIT/D!MPACT/TRANSUMO reduce the cost of network maintenance?	Yes and no. Every member is paying for a system, what they want to do is deliver one internet based service, so that maintenance cost are lower.	If the municipalities have to develop each of its own solution, that is much more expensive.	It is government funded.
Member commitment to network goals: Does IZIT/D!MPACT/TRANSUMO increase member commitment to network goals?	Yes, although it fluctuates, but now it increases.	Yes.	Yes, but TRANSUMO could have been done better.
Organization/ Participant Level			
Agency survival: Does IZIT/D!MPACT/TRANSUMO survive in the network?	Yes.	Yes.	Yes, and TRANSUMO is now trying to extend it in a new model, because it will be ended in 2009 but there are still couple of initiation projects.
Enhanced legitimacy: Does IZIT/D!MPACT/TRANSUMO enhance organizations/members legitimacy involved the network?	Yes.	They get more e-solutions.	Yes especially for the most powerful ones.
Resource acquisition: Does IZIT/D!MPACT/TRANSUMO increase its member's resource acquisition?	No.	They get more e-solutions.	Yes, more for the less powerful members.
Cost of services: Does IZIT/D!MPACT/TRANSUMO reduce cost of its member's services?	Yes IZIT is trying to.	Yes.	That was the intention.
Service access: Does IZIT/D!MPACT/TRANSUMO increase service access?	Yes.	Yes.	That was the aim of the project/research.
Client outcomes: Can clients receive a broad range of needed and coordinated services offered by IZIT/D!MPACT/TRANSUMO?	Yes that was the intention.	Yes.	That was the aim of the project/research.
Minimum conflict for multi program agencies across multiple networks: Does IZIT/D!MPACT/TRANSUMO reduce conflict across	Yes IZIT is trying to.	Yes.	That was the aim of the project/research.

networks?			
Who benefits the network effectiveness	Participants	Community and participants	Participants

Table B.5. IOSISP Process Dimensions

		IZIT (Healthcare Sector)	**D!MPACT (Government Sector)**	**TRANSUMO (Logistic/Transport Sector)**
Comprehensiveness		**Medium**	**High**	**Medium to High**
	Analysis	Initially, the analysis is a comprehensive, complete, coherent. This was later changed to detail.	They did huge design process; what type of interfaces, etc. it was pretty good analyses not only in terms of design but they also looked at the infrastructure and the application architecture needed for realizing for such a portal.	There was a very comprehensive analysis and it was good, but they could have been done better.
	Report	Project initiation documents were made and a vision document was created. All results of the project are pretty well documented.	Comprehensive.	Hundreds (e.g. PhD thesis).
Formalization		**Medium to High**	**Medium**	**Medium**
	Appointment of members	It works in two ways, members could be appointed by the offer from IZIT depends on project's needs, but members could also joined by their own willingness.	Not formally in the beginning, it was more based on personal connection and enthusiasm, but when the project was finished, members were formally appointed, there was also legal counselor.	Appointed by the company (the leader in the network).
	Organizational status of members	The members pay a member fee of 10.000 euro. There are no strict regulations of becoming a member.	The original founders more or less have special status, such as decision makers. Members have to pay such as member fee. They have such a rule how to be a member and their obligation of being a member.	There is no organizational status or kind of member fee, it was a research and government funded.
	Other arrangement (s)	The IZIT is organized as an operational unit to guide the inter-organizational	-	-

		projects.		
Focus		**Creative**	**Creative**	**Control**
	New joint initiatives on IT	Yes. IZIT is looking in the market what kind of ideas and also go the members and ask for their needs and solutions.	Yes. D!MPACT tried to use whatever idea or innovation the members had.	Initiation from the leader or the most powerful member in the network.
	Standardization	Yes. They develop an infrastructure so that different IS can communicate with each other and also to enhance the IT use.	It was also very important thing, to have a system that easy to integrate all back office application.	Yes, the planning process seeks for means to harmonize IT use of different members.
Flow		**Top down**	**Bottom up**	**Top down**
	Decisions	The decisions are taken by the board member (icZt).	All members have the same or equal 'voice' to make a decision or to propose new idea.	The decisions are taken by the most powerful member in the network.
Participation		**Broad Perspective**	**Broad Perspective**	**Broad Perspective**
	Representatives	Representatives were selected from each organization involved in the network as one of board members.	Approximately just one per party.	Around 3 people from each party.
	Get together	The meeting takes place differently depends on each project, and the board shall get together monthly.	There were meetings took place, but they did not meet with the same people on each meeting.	There was steering group; they get together in working group meeting.
	Coordination with own organization		Most of them they were head of their own IT dept. Once they had an agreement they could share with their own organization.	The owners of the company, couple PhD candidates and some professors (researchers)
Consistency		**High**	**Medium**	**Medium to High**
	How many times meet?	The meeting takes place differently depends on each project, and the board shall get together monthly.	During the project at least 4 - 5 times.	Steering group meets 2 - 3 times through the project, working group meeting sometimes every month/2 months, the duration of the project : 2.5 years

	Continued meetings	Yes	Yes	Yes

Table B.6. IOSISP Effectiveness

	IZIT **(Healthcare Sector)**	**D!MPACT** **(Government Sector)**	**TRANSUMO (Logistic/Transport Sector)**
Alignment	Yes, it helps align the hospitals and other members' goal with the network goal.	Yes, the governance of D!MPACT helps align especially the municipalities' goal with the network goal.	Yes, the governance of TRANSUMO helps align the participants' goal with the network goal, even though TRANSUMO could do better.
Analysis	Yes, there are improvement in term of better understanding of business processes, procedures and technologies. The knowledge of network contexts could also lead to better project management.	Yes.	Not sure. TRANSUMO as an organization could be better in organizing internal things. They could also done better in knowledge sharing session.
Cooperation	Yes, the governance of IZIT leads to a better mutual cooperation, although it is going very slowly.	Yes	Yes
Improvement in Capabilities	Yes, there is improvement in capabilities, but however, in planning and implementing IS, there are always tensions in the network, and planning is very hard to do because there are a lot of external reasons why the planning process is always difficult, and the only possible steps are very small steps.	Yes, D!MPACT helps participants involved in the project to be better off in preparing possible plans in the future.	Yes, the governance of TRANSUMO helps to learn how to do things better now, such as how to do better management project, how if we are working on project that is including both research and commercial projects.

APPENDIX C: Definitions

Table C.1. SISP input-process-output model

(From Figure 2.1. King (1988), Lederer & Salmela (1996) and Brown (2004))

Components	Definitions
1. External environment	”The sum total of factors external to the organization(s) conducting SISP that may have an impact on the SISP system“, which can be divided into two components: external business environment and external IT environment.
2. Internal environment	“The sum total of factors within the organizations(s) conducting SISP that may have an impact on the SISP system“, which can also be divided into two components: internal business environment and external IS environment.
3. Planning resources	Resources that are required to carry out the planning process, including top management and user input and involvement.
4. Planning process	“The set of steps for developing a strategic information plan, paying heed to the methods to be used, style of process (process characteristics) and implementation issues to be addressed“.
5. Information plan	Consists of the tangible outputs of the SISP process, how the plan content will be, and the general information architecture for the organization.
6. Plan implementation	The implementation or operationalization of the plan.
7. Planning outcomes (primarily alignment)	The outcomes of SISP, including alignment of IS plans and objectives with business plans and objectives, analysis, level of cooperation achieved and improvement in capabilities.

Table C.2. Conceptual research framework networked SISP (input-process-output model)

(From Figure 2.2. Van den Broek, 2008)

Components		Definitions
IOSISP input	Informational inputs	Business strategic plan that includes mission, objectives, strategies, goals and programs of the organization are considered as critical informational inputs to the SISP process.
	Resource (non-informational) inputs	Personnel time, funds or financial resources, computer time, also user, staff and top management commitment and trust are non-informational inputs that have to be used and evaluated.
	IS planning goal	The reason for conducting SISP that also influences SISP process.
IOSISP process	Comprehensiveness (Non-comprehensive vs. Comprehensive)	Frederickson (1984) defines comprehensiveness as "the extent to which an organization attempts to be exhaustive or inclusive in making and integrating strategic decisions".
	Formalization (Informal vs. Formal)	Segars & Grover (1999) define formalization as "the existence of structures, techniques, written procedures, and policies that guide the planning process".
	Focus (Creativity vs. Control)	Focus refers to "the balance between creativity and control orientations inherent within the process structure of strategic planning" (Chakravarthy, 1987).
	Flow (Bottom-Up vs. Top-Down)	Flow refers to how the strategic planning process is initiated. In Top-Down flow, the initiation of strategic planning process is from top management to the lower levels of the organization. In Bottom-Up flow conversely, the initiation is from lower levels of management to the higher corporate levels (Chakravarthy, 1987).
	Participation (Narrow vs. Broad)	Segars & Grover (1999) explain that "participation captures the breadth of involvement in strategic planning".
	Consistency (Inconsistent vs. Consistent)	Consistency captures "the frequency of planning activities or cycles as well

		as the frequency of evaluation/revision of strategic choices" (Segars & Grover, 1999).
IOSISP effectiveness	Alignment	The IOSISP effectiveness could be assessed through the successful alignment of IS and business strategy.
	Analysis	It is defined as the analysis of processes, procedures and technologies.
	Cooperation	Cooperation here reflects agreement to implement the plan. An effective IOSISP would lead a better mutual cooperation.
	Improvement in Capabilities	It is needed in order to achieve IS-business alignment.

Table C.3. Research framework of IOSISP context

(From Figure 2.3. Van den Broek et al., 2008)

Contextual Factors	Definitions
The external environment	Consists of type of industry involved in the SISP process, heterogeneity of the external factors in an organization's external environment, including external stakeholders, dynamism of changes in the external environment, and hostility that refers to environmental threads such as market pressure and politics.
(Inter)organizational environment	Consists of (Inter) organizational structure and governance, (Inter) organizational size, organizational culture and the role of IS function.
Nature of IOS	Refers to how IOS is planned inter-organizationally.
Resources	Consists of informational resources (business goals and plans, IS mission and vision), non-informational resources (user, IT and top management commitment, financial resources, trust) and IOSISP planning goals.