Building Inter-organizational Cooperative Network for IT Collaboration

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Abstract

Information technology has been a central enabler in the process toward network society. Despite the critical role of computers in inter-organizational arrangements, coordination of IT decisions within these networks is a fairly unexplored area, both in research and in practice. The processes through which the orchestration of IT in networks takes place are largely hidden. In this paper we investigate the processes through which three public sector networks tried to reach collaborative agreements in the use and management of IT. We present some preliminary findings in the areas of management, vision, mission, and shared goals in the context of networks' IT governance.

1. Introduction

Information technology (IT) has been a central enabler in the process toward network society. The complexity of the alliances, of subcontracting agreements, and of decentralized decision-making would have been simply impossible to manage without the development of computer networks [1]. Despite of the critical role of computers in inter-organizational arrangements, coordination of IT decisions within these networks is a fairly unexplored area, both in research and in practice. The processes through which the orchestration of IT in networks takes place are largely hidden.

Ability to create information partnerships has led to several success stories [1, 2]. Such stories provide evidence of the potential that IT has – if the managers in partner organizations are able to use it.

However, many initiatives to coordinate IT decisions fail within networks. These failures are not necessarily very visible and thus get very little attention. The idea of increasing coordination in processes, information, systems and infrastructure is quietly terminated. The negotiations go on endlessly but no commitment is achieved, the project is scaled down to a "pilot" that is never even intended to be implemented further. The project may also eventually be started - but fails because of lack of initial commitment. The core group, managers working together, simply have not been able to find a way to get the institutional support for their innovative ideas.

This research investigates the processes through which networks can reach agreements on the use of IT. The research problem is formulated as follows: *How to build and maintain inter-organizational cooperative network for IT collaboration?*

The practical objective is to provide methods for the managerial group, who is seeking commitment of different partners to foster a specific IT related collaborative idea. It is suggested, however, that networks differ in terms of dominant coordination mechanisms. Hence, the group should employ methods that fit with the general coordination style of the network.

The scientific purpose of this paper is to explain the outcomes of early negotiations, i.e. why the process succeeds or fails. The importance of aggregate network level analysis has been rising lately. In a recent literature review on network research, Provan et al. conclude that more research is needed on network level governance, as opposed to dyadic or single organization perspectives [3]. We acknowledge the dynamic nature of networks: the explanations for outcomes are process theories, rather than variance theories [4]. Preconditions and situational variables are not, as such, sufficient to explain outcomes. The outcomes result from the interplay between initial conditions, contextual changes, and process events [5].

The empirical data of the study is gathered from three networks. One has fared well, the second one was intermediate success and the third one failed.

2. Theoretical Background

Theoretical approach of this paper originates from the research tradition of inter-organizational relationships. An inter-organizational relationship (IOR) can be defined as *"a social action system on the premise that it exhibits the basic elements of any*

organized form of collective behavior" [6]. These IORs include strategic alliances, partnerships, coalitions, joint ventures, franchises, research consortia and various forms of network organizations [7].

Within information systems science, the research draws from the research tradition of inter-organizational systems (IOS). In the initial phases of network, nurturing championship is critical for the success of eventual IOS project. Champions are needed to inspire stakeholders in different organizations through transformational leadership behaviour [8]. In similar vein, Kumar and Crook state the importance of collaboration between members at different organizational levels.

Research on strategic IS planning (SISP), and more recently that of IT governance, will also be used as a theoretical background. While most of the studies in this area address IS management and governance mainly as taking place within a single firm, some researchers have already identified the need to incorporate network level considerations. For instance, Finnegan et al. argue that there is growing need for inter-organizational SISP research [9]. This argument is further developed by Salmela and Spil [10]. The planning in IOS context needs to involve stakeholders in different organizational levels and is often based on agreements [11].

The research does, however, also draw from the more general network research tradition that has evolved in different disciplines. Perhaps the most fundamental difference between a network and an organization is lack of a single authority to ensure coordination of actions. Absence of a single authority has led networks to employ a wide array of mechanisms to be used for building and maintaining commitment to joint efforts. These mechanisms have intrigued researchers in many fields, such as economics [12], strategic management [13], organization science [14], marketing [15], sociology [16], public administration [17] information systems [18, 19] and strategic information systems planning [2].

Finally, because public service networks involve both public and private players, literature on public administration will be used to add insights to the theoretical background. Provan and Milward have argued that the effectiveness of public networks should be assessed in terms of different stakeholders and at different levels. The key stakeholders are: principals, agents and clients. Levels of network analysis are community, network and organization/ participants [17]. Allison [20] has classified the differences between public and private sector management into three groups:

- Differences in environmental characteristics
- Differences in the relationship between environment and organization
- Differences in organizational factors

Governance in networks requires distinctive management practices from traditional public sector management: Government is not the single dominant actor that can unilaterally impose its will: hierarchical, central top-down steering does not work in networks that have no 'top'. All in all, a network manager often operates from a comparatively powerless position with little hierarchical means at disposal, yet there are several different strategies that network managers can utilize. [21]

3. Methodology

Cunningham categorizes different types of case research into *intensive case*, *comparative case* and *action research (AR)*. This study is based on mixture of comparative case and action research approach.[22]

In the comparative case approach, the researcher generates an explanation for one case and then replicates it with similar cases. This in turn helps to understand why certain conditions did or didn't occur and then offers interpretations.[22]

Rapoport [23] has defined action research as follows: *"Action research aims to contribute both to the practical concerns of people in an immediate problematic situation and to the goals of social science by joint collaboration within a mutually acceptable ethical framework."* This twofold view of the objectives of action research - to solve a problem for a client and to advance science - is, perhaps, the most fundamental feature of action research [24, 25].

Action research is a clinical method that places the researcher in a helping role within real organization. In all three cases of this paper the researchers were invited to help organization with their IOR related problems. Action research is often viewed comprising two stages. In the first diagnostic stage an analysis of the social situation is made in collaboration with organization's personnel. The second therapeutic stage involves collaborative change [26].

The cases of this study were chosen from the Finnish well-being services industry, consisting of mainly public sector organizations. In all three cases, the network structure was in its early stages. Longitudinal data describing the early phases of network building was collected from documents, interviews and participatory observation (including researcher diaries and group discussions). The results presented in this paper are based on the comparison of experiences in the three cases [22].

The first case, Centre of Expertise on Social Welfare (Vasso), was conducted during the years 2002-2007.

The aim was to create information systems' governance structure for the social service sector in the area of South-West Finland. The second case was conducted in a network of four municipalities in South-West Finland. The objective was to increase collaboration in planning the use of IT to support early childhood education (ECE) in 2004-2007. The case describes the creation of network that focused on initiating collaboration in the use of IT in ECE services. The third case reports findings from the Finnish Electronic Prescription System (EPS) pilot in 2000-2006.

The degree of intervention varied in the cases. In the cases of early education and social welfare the researchers were strongly involved as plenipotentiary actors in building and reinforcing networks. In these two cases, the researchers were also part of the core management group who actively tried to promote increased collaboration within the network. In the third case, the role was more a consultative one.

4. Cases

In the first case, the aim was to create information systems' governance structure for social welfare service sector in one regional area. In Finland, municipalities have the primary responsibility for organizing welfare services to their inhabitants. The social services sector is quite heterogeneous as it includes e.g. day care services for children, services for handicapped, social work, elderly care, and substance abuse treatment and prevention. Individual customers may have several social problems at the same time and thus need multidisciplinary care [27]. Hence, social services are produced by a network of professional services in each municipality.

The area of South-West Finland consists of 53 municipalities with populations ranging from 245 to 175.000 inhabitants. Knowledge of IT and its governance varies a lot between municipalities. Larger cities have dedicated personnel for IS governance e.g. CIO and IT-managers, whereas small municipalities have only a part time IS support person. The cooperation between municipalities in IT related issues was minor.

Vasso is owned by local municipalities. The objective of Vasso is to create knowledge to the social sector in a co-operative manner. It provides interpersonal and –organizational networking and is the network coordinator of the region in matters related to social services. It can be called with term network administrative organization (NAO) [17].

The objectives of Vasso are not directly related to promoting the use of IT. Majority of initiated projects are related to the substance of social services. The new managing director of Vasso was, however, aware of the need for inter-municipality collaboration to promote increased adoption of IT. His background as a director of social services of mid-sized municipality had shown him both the significance of IT and the difficulty of implementing it in small and even mid-sized municipalities.

Shortly after the foundation of Vasso in 2002, the new managing director of Vasso contacted the IS research group in the local business school. The initial group who started discussing about first actions comprised also a teacher from local school of social welfare and a development director from university hospital. This core group acted as champion and was critical resource for organizing process. The aim was set to produce an inter-organizational strategic information systems plan for the social welfare sector in the South-West Finland. The idea was that all municipalities and third sector service providers in South-West Finland would develop a joint strategic IS plan. The formulation of a joint plan was seen as a first step for committing municipalities to collaboration in the development and implementation of IS in the social services.

Because Vasso couldn't finance the project, arranging funding for SISP was the first task. The municipalities themselves weren't interested in funding the project. After one year of investigating potential sources of funding and clarifying the arguments for the project, the core group succeeded in arranging funding from the regional council of Southwest Finland. With this funding, the interview based analysis was made about the current state of IT in social services. The interviews took place in winter 2004.

Majority of the interviewees were directors of social welfare in different municipalities. The contacts proved to be useful later when members were persuaded to join the IT council. The interviewees assessed that strong commitment to the provincial level information system plan would be difficult to reach. Most municipalities lacked financial resources and personnel for developing their information systems. Also, the traditions for inter-municipality collaboration were limited.

The results of the first round of interviews were, however, positive enough to justify further planning efforts. In fact, a few interviewees had suggested that an area level strategic information systems plan for the social sector might be useful. It was also strongly recommended that there would be one full-time IT coordinator who would coordinate the projects and an area level IT council that would initiate, and supervise the projects.

IT coordinator was hired in fall 2004 and IT council started to work after few months. IT council's first task

was to develop strategic information system plan. During the planning process it shrank to development plan divided to two parts. Informative part explained how IT enables new practices and models in producing social services. The implementation part suggested actions for developing area level practices that would support inter-municipality collaboration in the joint development of social service processes and supporting systems

One reason why IT council didn't succeed to make strategic information systems plan, was the different views of strategic thinking between the core group and the council. Most members of the core group were used to design school strategy process and followed a fairly linear strategy formation process. The members in the IT governance council preferred a more emergent approach to strategic planning. One explanation for that could be that the council members and their organizations didn't want to commit to any detailed strategy. In addition to that, emergent approach allowed them opportunist behaviour, i.e. to choose the option which is best for them.

Perhaps the main effect of the strategy planning process was that a council was founded with an idea that it would act as informative forum, where municipalities and other actors could share their experience about IT issues. The membership in the council is voluntary and members don't have any official status from their own organizations.

The council is still active and has sessions twice a year. The members of the council see it as a forum for changing experiences and sharing thoughts. Although the organization is much weaker than what was suggested in the original plan, it can be seen as some form of governance structure. The council has proved to be a good place for promoting new inter-organizational IT projects. The meetings of the council have been critical for getting two IOR related IT governance projects to start. In fact, the second case of this paper (ECE case) was presented as a proposal in the council and this presentation had a significant effect on committing some key persons in the four municipalities to the project.

It is obvious, however, that the networking efforts were only partly successful. They strengthened ties in terms of IT utilization in social sector. Vasso's role as network administration organization in IT governance was accepted. However, neither the municipalities nor the sponsors were interested to fund the network. The amount of genuinely active participants in the council has remained small. For the participating organizations the immediate benefits remained moderate: organizations received knowledge on how to utilize IT, but more concrete forms of collaboration were not achieved. The possibility to negotiate IOR cooperation can, however, bring them better service in future.

All in all, this case can be evaluated as partly successful. It didn't exceed original objectives but still succeeded in initiating some forms of inter-organizational IT governance collaboration in South-West Finland.

The second case describes the creation of IT utilization oriented network in the context of early childhood education (ECE). In Finland every child has a statutory subjective right to receive public day care and the municipalities are responsible for organizing day care to every child according to demand [28].

The creation of IT utilization oriented network began in 2004. In the first phase (2004–2005) the core group formulated first drafts of the possibilities of using IT in ECE. Arguments were developed for inter-municipal collaboration as a means to better realize these possibilities. The possible actors in the network were also outlined. In this case, the initial core group included two IS researchers and one ECE researcher from local university. The IS researchers had worked in Vasso case and utilized their contacts in different municipalities to promote this project. The contacts were mainly directors in social sector and had rather powerful position in municipality's hierarchy. The directors in turn encouraged their own municipalities' ECE managers to participate in project.

The participation of the ECE researcher was important for the project's success. She had worked as researcher in many ECE development projects and was therefore familiar with most of the ECE managers. The presence of the ECE researcher invoked confidence among the ECE participants. She interpreted IS researchers' IT based concepts and terms to the ECE professionals.

In the fall of 2005 the foundation of the network was established. The core group organized seminars and made several informal discussions, where a preliminary proposal was presented and ECE managers were asked whether they were personally committed to participation and how likely it would be that their municipality would be interested.

In the early 2006 four municipalities made an agreement about a common development project and filled in a funding application for a one year long developing project to the Finnish Ministry of Social Affairs and Health. The funding application form has to include things like project plan, governance model, budget etc. The application form serves as a legal agreement between the participating municipalities. While the Ministry provides most of the funding for the project, the municipalities are expected to provide some own funding. Although this amount per

municipality was only few thousand euros, this was still one of the major obstacles for other municipalities to participate.

After the positive funding decision was received, the actual inter-organizational cooperation commenced quickly. A steering group with chairman was established with representatives from the four municipalities and two universities. The initial development plan was further specified and the agreements on fiscal matters between participating organizations were signed. The members of the steering group had worked with the initial application together and had therefore created a common value space for this project.

The actual work in the project started in fall 2006 with orientation lecture. A total of 50 ECE professionals with different professional backgrounds varying from the director of ECE to day care teachers and administrative officers participated in the developing process. Altogether over 150 people were involved in the network during the years 2004–2007.

The aim of this network was to increase day care's capability to utilize IT at the operative and management level. Three workshops were organized to assess the usefulness of potential IT applications in childhood education processes. In summer 2007 a one-day seminar was held to spread projects results. Altogether 50 ECE professionals and managers from different parts of Finland participated in the seminar. This was the first time when a meeting was organized that focused solely on IT issues in ECE in Finland.

The end of 2006, the negotiations for a new development project began. Members of the steering group and working groups were asked which of the development proposals should be implemented and how. Based on the answers, the foundation for further development project was formulated. Three municipalities showed their interest to continue IOR cooperation. Funding application was delivered to Ministry of Health and Social Affairs. After positive decision a two year long development project started.

At the community level the network was a success. Ministry admitted funding twice and ongoing development project was lifted as one of most important e-Government projects in the municipal sector in Finland. At the network level the project also succeeded well, even if one of the four municipalities didn't continue to the second phase. The three other decided to invest in two years long development project. Same wide network about IT in ECE was established. On the participants and organization level ECE staff and their master organizations gained a lot of knowledge and capabilities to utilize IT in future. This in turn can produce better service for ECE's clients - children and parents. The case didn't succeed to create clear network administrative organization. The principal researcher from a local university created the network and in the long run it remains to be seen whether the collaboration will continue. Despite the weaknesses of the ECE case it can be evaluated as successful in initiating an inter-organizational IT governance collaboration network.

Third case: Implementation of Electronic Prescription System (EPS) The last case reports findings from the Finnish Electronic Prescription System (EPS) pilot.

In Finland, medicines may be sold to the public only by pharmacies and subsidiary pharmacies, except in sparsely populated areas, where non-prescription products may be sold by medicine dispensaries owned by pharmacies. An order by doctor, dentist, or veterinary surgeon is needed for the purchase of prescription medicines from a pharmacy. [29]

All in all, the current Finnish manual system for medicine prescription is relatively sound. Patient receives a printed (either filled in hand writing or computer made) prescription form for medication from the doctor containing identification data of patient and physician. There is a place for two drugs and area for dispensing and renewal information. The patient brings the forms to a pharmacy, where pharmacist feeds in the data from the prescription to a pharmacy program for dispensing the medication. The program calculates the price for the drugs deducting the amount of national insurance if the client has the social insurance card with her. The program prints bar code slips with the price which the pharmacist attaches to the drugs. The pharmacist marks on the form the amount of medication which is dispensed and returns the form to the client with the medication. The second page of prescription is left at the pharmacy for invoicing the national insurance office of the insurance part of the price of the medication. [30]

The prescription ordering process consists of public and private actors and could be defined as a public – private network. [17]

In the year 2000, the Ministry of Social Affairs and Health set up a project to suggest a national concept for ePrescribing. The preliminary report about electronic prescription in Finland was published in 2001. In 2002, the Finnish Ministry of Social Affairs and Health started implementing the national concept suggested in the report. It selected units from health care organizations and a couple of nearby pharmacies in four different regions to pilot the national concept described in the report. The implementation approach was very similar to intra-organizational implementation processes, and the benefits of different stakeholders were not exhaustively evaluated.

Furthermore, the whole process was technology led instead of being user or organization centric. The project didn't systematically deploy champions. Instead, the promotion of the system relied on individual enthusiastic users.

A national steering group coordinated the locally organized pilots with a small budget. An experimental decree on ePrescribing was issued in 2003. It laid down provisions among other things on preparing, signing, technical content, altering and delivery of electronic prescriptions.

The steering mechanism relied mainly on the imperative nature of the experimental decree and the participating organizations didn't have agreements on inter-organizational intercourses. As the representatives of the participating organizations were involved in the project among their other tasks it remains somewhat questionable how deeply committed they were to the pilot project.

The construction of the system took 2 years, and the first clinical pilot started in 2004. By the end of 2004, two out of the four piloting health care units had integrated the EPS into their Electronic Patient Record (EPR). The pilot pharmacies still used a stand-alone system, which was not integrated into pharmacy systems and thus created extra work at the pharmacies. In June 2005, the third integrated EPS and the first integrated pharmacy system were implemented. Furthermore, in the spring 2005 the organization of the national e-prescription pilot was changed thoroughly; the part time project manager of the pilot was changed to a major consultancy company, which re-organized the administration of the pilot entirely.

The amount of produced e-prescriptions remained still very small and at the end of 2005 only approximately 800 electronic prescriptions had been dispensed (there are approximately 40 million dispensed prescriptions in Finland annually). In June 2006 the ePrescription pilot was ended, because it had "reached the objectives set to it".

The implementation pilot was coordinated at first hand by a part-time project manager designated by the Ministry of Health. Yet the project manager had little means to influence the network. He had neither rewards for good performance, nor penalties for under performance.

There was a broad conception among interviewees that the organization and governance of the pilot had been a failure. Time scale of the project had been drawn out constantly, the pilot was under-resourced both in terms of money and personnel, and responsibilities were not clear.

Several interviewees reported that steering group was too large, and decision-making was difficult. Decision-making was further aggravated because there were no prepared drafts to be used as a basis of decision making. Finally, when it became evident that pilot would not succeed with present resources a major consultancy company was hired to take responsibility for project management.

The pilot was a peculiar combination of different governance methods. The actual 'management' was conducted through steering group which had little normative rules to affect to the pilot. Some of the interviewees referred to it as a debating club.

As the objectives and benefits to be attained were expressed loosely there was no clear common objective for all the organizations to pursue. In order to overcome the obscurity of the pilot, it would have needed hierarchy.

Organization of health care in general is still very hierarchical and some of the actors were expecting firmer steering for the pilot. However as the pilot network consisted of actors with different backgrounds (e.g. public sector, private sector, "third sector") the hierarchical steering failed to work due to vagueness of "chain of command". In addition, the pilot suffered from incompleteness of legislation which in turn hindered the pilot.

Yet the situation would have been eased if actors had have contracts among each other defining the rights and responsibilities in the pilot. As the contractual jurisprudence was lacking, the project lost its final coordination mechanism.

To summarize, EPS implementation pilot can be considered as a relative failure. On the community level, the pilot didn't bring much value added. The pilot was set up to improve the prevailing prescribing process, but the visible results were insignificant measured by the volume of electronic prescriptions compared to paper-based prescriptions. The proportion of electronic prescriptions remained strikingly low throughout the whole project.

On the network level the project failed too. The inter-organizational collaboration failed to deliver expected benefits and individual organizations perceived no benefit from EPSs. As the amount of electronic prescriptions was low and the organizations needed to support two different systems at the time, the result was adverse. However, as the objectives of the pilot were expressed vaguely in the first place it is difficult to compare achievements to practically non-existent objectives. Low amount of prescriptions makes it also difficult to provide any estimates about potential benefits to patients.

As the project was later cancelled it can be claimed that the pilot project was a failure also on the organization and participant level. Furthermore, theme interviews revealed the dissatisfaction of majority of actors. Probably the biggest benefits were gained by

participants and their master organization in terms of experiencing the challenges of an inter-organizational IS implementation, which can help the organization of future IOS implementation ventures.

5. Discussion

Based on the experiences gained in the three cases it appears that active participation of network level organization is important in IOS governance. Vasso and the Ministry of Social Affairs and Health were widely recognized as network orchestrators which in turn institutionalized network structure. In the early stages of network building, the core group at the network level should design the initial proposal for the content and governance of network collaboration. Both in the Vasso case and in the electronic prescription system case, this design work was not completed, either because of lack of vision, resources and/or attention.

The managers and IS designers in the public sector appear to be familiar with traditional design oriented top-down approaches (e.g. waterfall model). Based on three cases it appears that planning in networks should be adaptive and explicitly address the different stakeholders' interests. Furthermore, there should be a backward loop in the planning process. The process should be open to emergence of totally new things. An important feature is a continuous planning process which identifies important stakeholder groups and keeps them committed to the network.

In all three cases, the initial development idea was invented outside of the actual service network. Furthermore, the initial idea was suggested by IT oriented people, rather than by welfare service professionals. Hence, when the formation of Vasso and ECE networks was initiated, the presence of ECE and social sector professionals was extremely important. The IS researchers' values and concepts are based on their prior experiences in the business and information systems contexts. They are totally different from those that professional in welfare services have. The participation of ECE and social service professionals in the initial group was very critical for creating trust among network participants.

In all three networks, the early stages of network formation appears to have similarities with the process framework presented by Ring and van de Ven [7]. Formal, legal and psychological contracts were important for gaining organizational and personal level commitment in network related IT governance. Furthermore, in the more successful cases the individual level psychological contracts were achieved first. After that the network formation proceeded to financial contracts and finally to the definition of formal network structure and authority. Perhaps the most promising avenue for future research is to investigate the applicability of Ring and van de Ven framework to the analysis of early phases in the efforts to build ICT governance in networks.

Hence, our research also supports the findings of Wassenaar and Gregor [11] about SISP process in an inter-organizational context. Organizational level commitment to planning requires personal commitments. A single committed person may not, however, be sufficient to ensure organisational commitment. There is a need for several persons who sell the idea of network collaboration inside their own organization.

In Vasso and ECE case it was the expected future benefits that were the most important theme in the early phases of network building. The early discussions and group work focused on the benefits of IT. This in turn improved the arguments about the benefits that each participating organization will gain. An obvious reason for the failure of electronic prescription pilot was that the participants' missed common conception of future IOS benefits.

6. Summary and future research

Adding IT decisions to the sphere of network level coordination is far from easy. Both IT and business managers are often accustomed to viewing IT decisions primarily against internal needs within their own organisations. This paper invites them to carefully weight the gains that can be achieved with network level harmonization and orchestration of IT decisions. If they find areas where they should seek collaboration with their partners, this article provides them with observations about challenges in initiating such cooperation as well as some preliminary findings about how to manage them.

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