SOCIAL CAPITAL AND KNOWLEDGE MANAGEMENT OF ORGANIZATIONAL NETWORKS

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Abstract

The study of five types of organizational networks aims to understand how knowledge sharing and social capital are related together to management of organizational networks. Our research questions were (1) what are the enablers and obstacles for knowledge sharing, (2) what are the connections between enablers and obstacles of knowledge sharing and dimensions of social capital, and (3) what are the managerial implications for network management. Based on findings of this study, we assume that in knowledge management and in social capital development in organizational networks different dimensions of social capital may need different kinds of development efforts. The study showed that different network types had different kinds of knowledge sharing needs, and in part similar and different enablers or obstacles of knowledge sharing. Enhancing the development of relevant dimensions of social capital the effectiveness of these enablers may be intensified in the networks.

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1 Introduction

New organizational structures are needed in complex business environments for managing complex knowledge, technology and service processes. Enterprises that strive for competitive advantages through collaboration create new inter- and intra-organizational design and structures as organizational networks. Teece (1998:75) states that the essence of the firm is its ability to create, transfer, assemble, integrate and exploit knowledge assets. The firm gains its competitive advantage from the competences deriving from knowledge assets. According to Teece (1998) these competences reflect both individual skills and experiences as well as distinctive ways of doing things inside firms. Since these competences are difficult to imitate they will if

effectively deployed and redeployed provide the foundations for competitive advantage. The ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments is defined as the firm's dynamic capabilities (Teece et al. 1997). The essence of competences and capabilities is embedded in organizational processes that are shaped by the assets the firm possesses and by the evolutionary path it has adopted. Teece et al. (1997) discuss the significance of organizational processes, positions and strategic alternatives on firm's competitive advantage on firm level. Following Teece's et al. (1997) argumentation, we expect that the intra-organizational and inter-organizational processes, technology in-use, intellectual capital, customer base, and external relations with suppliers and stakeholder groups are equally important for organizational networks as for a single firm. The way how things are done in the network, the assets of the network, and the evolutionary path the network has inherited or adopted along the strategic choices it makes will be in the core of the network's competitive advantage.

In this article, we concentrate on the organizational processes that enable both the sustainability and positive regeneration of an organizational network. Three types of processes have been recognized as important (Hastings, 1995, Teece et al. 1997): coordination or integration, learning, and development or reconfiguration. Coordination refers to integration of internal and external activities and technologies. Learning refers to a dynamic process that through experimentation and repetition enables the firm to perform better and to find new production or service opportunities. Reconfiguration and transformation refer to the ability to sense the need to reconfigure the firm's asset structure, and to accomplish the necessary internal and external transformation. These three processes: integration, learning and transforming, form a foundation for firms to collaborate in a network, as well. According to Ritter et al. (2004:175) a firm itself is nothing more than a complex network of internal relationships among people, departments, and functional units that form the basis of its ability to develop and implement its strategies. Therefore, the firm is embedded in a network of ongoing business and non-business relationships, which both enable and constrains its performance. Firms are not in total control of all these relationships. Moreover, they are subject of the control and influence of others within and around the relationship. Business relationships with suppliers, complementors, competitors and customers form organizational networks that support the firm's value net. Networks can also be functions based, for example like production, distribution, or innovation networks (e.g. Ranta, 1998, Pyka, 2002, Ritter et al. 2004).

Firms and networks of firms are complex adaptive systems with business and social relationships among people and units that are not completely orchestrated by top management. Nevertheless, we are interested in the enablers that establish and strengthen durable network relationships beneficial for the network partners. Different types of relationship and network management situations require a firm's or individual's skills and competences to handle the kinds of interactions taking place in the best interest of their firms and themselves (Ritter et al. 2004). These competences derive from the ability to use the knowledge assets. The dynamic capabilities of the network - to integrate, build and reconfigure the internal and external competences - provide the network the competitive advantage it is gaining for. Successful network is able to adapt to the changes of its environment. The adaptation involves both proactive and reactive elements and requires the network partners to be sensitive towards the dynamics in their network relationships. Different types of business relationships need different kinds of relationship management, e.g. leading or following, influencing or being influenced, planning or coping, initiating or reacting and so on (Ritter et al. 2004). Likewise, each network relationship has a life-cycle during which the ways how things are done in that relation will change. In order to cope with these relationship and network management challenges an organizational network needs active and functional knowledge management focusing on knowledge sharing among the individuals in the network. The process of knowledge sharing is founded on the network ties that are recognized by the network partners. The ties are either strong or weak (Granovetter, 1973) creating network closure or sparse network with structural holes (Burt, 2000). Network structure depends on the nature of the business relations. There must also be the reason why the network exists and that is usually expressed by the shared vision. Network structure, awareness of the network ties and trust and trustworthiness in the relationships builds up the social capital of the networks (Tsai and Ghoshal, 1998). The intra- and inter-organizational processes that facilitate network performance are in the focus of this article. In more detail, we are interested in what are the connections between knowledge sharing and the dimensions of social capital, and how social capital can enable the knowledge flow in organizational networks.

The concepts of knowledge management, knowledge sharing and social capital are used here to describe how organizational networks use and develop their knowledge and human capital, and competences. We expect that the organizational processes behind these concepts are strongly connected to the dynamic capabilities of the

network. The study aims to understand how knowledge sharing is related to social capital in organizational network context. The research questions are:

- What are the enablers and obstacles for knowledge sharing in organizational networks?
- What are the connections between enablers and obstacles of knowledge sharing and the dimensions of social capital?
- What are the managerial implications for network relationships management and collaboration in organizational networks?

2 Key concepts of the study

This chapter defines the key concepts – social capital, knowledge management and organizational networks - of our study. Our focus is on how these constructs manifest themselves on organizational level and our theoretical basis arises from organizational behavior. For this reason we exclude the economic and regional policy discourses of social capital from this article. Similarly, we view knowledge management from the organizational behavior point of view. Thus, the information technology and economic approaches to knowledge management are not in the focus of this article. However, as we in the introduction pointed out, we agree that knowledge assets are strategically important and economically significant resources for companies. In addition, we also agree that the use of modern information technology is essential for organizational networks with dispersed network partners. However, here our main approach to knowledge management is how people as organization members behave in these networks in order to acquire and disseminate the knowledge they need and use.

2.1 Organizational social capital

Social capital is recognized as an important capital for companies and company networks for renewal of intellectual capital and for increasing innovation potential (e.g. Nahapiet and Ghosal, 1998). Social capital is conceptualised as a set of social resources embedded in relationships including also the norms and values associated with the relationships (see e.g. Tsai and Ghoshal, 1998, Putnam, 1995) On individual level, people who do better are expected to be better connected. According to Burt (2000) social capital can be viewed as an asset connected to a certain position in the structure of exchanges that certain people or groups are dependent on. These people

or groups trust the others and are obligated to support each other. We can also extend this metaphor of social capital to organizational units. Competitive advantage may arise from the network relationships, companies that are better connected may also perform better. Burt (2000) adds to networks also the structural holes. Structural hole indicates that the people are focused on their own activities such that they do not attend to the activities of people in the other groups. According to Burt (2000), people on either side of a structural hole circulate in different flows of information. Thus, structural holes provide opportunity to broker information that is more additive than overlapping for the network. Structural holes that can also be understood as the weak ties of the network, facilitate thus new knowledge creation and innovativeness in a network.

Nahapiet and Ghosal (1998) identify three dimensions of social capital: the structural dimension referring to network ties and configuration, and to the easiness to join and fit in the network, the cognitive dimension referring to shared language and narratives, and the relational dimension referring to trust and norms, as well as obligations within the network. These dimensions contribute to the motivation and ability to exchange and transfer knowledge that enhances the growth of intellectual capital. Here, we use Sandefur's and Laumann's (1998) paradigm of social capital that arises from Coleman's (1988) definition: social capital is accumulated history in the form of social structure appropriable for productive use by an actor in the pursuit of her interests. According to this thinking different types of social capital are useful in attaining different goals. Sandefur and Laumann (1998) emphasize three characteristics of social capital. First, social capital may provide benefits of relevance, timeliness and trustworthiness of the information shared and used in the network. Secondly, social capital provides the benefits to influence and control others, as well as to be free of others' influence. Thirdly, repeated interaction among the same actors over time accumulates trust and mutual obligations, i.e social solidarity. This may benefit for the network members social support conducive to maintaining health or coping with crises and to free individuals to use their energies more efficiently and effectively to attain desired goals (Sandefur and Laumann, 1998).

2.2 Knowledge management

Davenport and Prusak (1998) define knowledge as "a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information". A company's knowledge can deal with product development, new technologies, new materials,

employees and their competencies, markets, customers, and so on. It can be a raw material for a company, or/and a product it produces, or a service the company offers to its customers. Knowledge is related to most of the processes and operations of companies, and knowledge and information are needed e.g., for production, logistics, product development or new business strategies (Järvenpää and Immonen, 2002).

According to Polanyi (1966) knowledge consists of a tacit element and an explicit element. Tacit knowledge refers to knowledge that is hard to codify, express and communicate explicitly. Instead, it is in the "mind of knowers", and gained through experience, thinking, and learning. Explicit knowledge is expressed and communicated in formal and systematical form, and it can be shared between individuals and collectively within and between organizations. In organizations, explicit knowledge can be stores in data bases and repositories, whereas organizational norms, routines and practices are often tacit knowledge.

Knowledge management aims to help companies in managing their knowledge, especially intangible knowledge assets. For companies it is important to maintain and increase the organizational knowledge they have as a competitive advantage (Caddy, 2001). For this purpose, companies want to facilitate knowledge creation for individuals and groups to learn new things, and for inventing new ways to do things. Companies expect that knowledge creation facilitates new product and service development and therefore creates also new business possibilities. At the same time, companies want to minimize their knowledge losses. Companies want to protect the critical knowledge, for example with patents and non-disclosure agreements, and with minimizing the risks of outsourcing, downsizing and resignations. Moreover, companies strive for searching and recovering the isolated and separated knowledge embedded in individuals' and groups' behavior. For identifying, accessing and utilizing this "orphan" knowledge (Caddy, 2001) companies implement and improve personnel information systems, apply knowledge-mining tools for codified information, develop mentoring practices and improve the organizational culture to be more encouraging for knowledge and information sharing.

Knowledge management refers to a process that helps organizations to find, disseminate and transfer important explicit and tacit knowledge and expertise necessary for activities such as problem solving, decision making, strategic planning or dynamic learning (Gupta et al. 2001). According to Järvenpää and Mäki (2001) knowledge management includes creation of new knowledge, knowledge sharing and diffusion, and methods to promote knowledge creation and sharing. Knowledge sharing

refers to sharing, diffusing and transferring of knowledge between individuals, groups and organizations.

Enablers for knowledge sharing are organizational mechanisms for intentionally and consistently developing knowledge in organisations. According to Ichijo et al. (1998) the enablers may stimulate individual knowledge development, and protect knowledge development by tackling obstacles to it. In addition, they may facilitate the sharing of individual knowledge and experience among organizational members so that individual knowledge will be transferred into organizational knowledge.

2.3 Organizational networks

An organizational network refers to both intra- and inter-organizational networks that consist of several units, companies or other organizations. By networking organizations aim to increase their effectiveness, competences, and human and material resources, faster time to market, and creation of innovations (Carney, 1998, Ranta, 1998). New organizational forms like teams, virtual teams and project-based organizations are examples of intra- and inter-organizational networks in use. Knowledge-based approach to company networks explains the rationale for networking to be the need to create novelties (Pyka, 2002) The knowledge of strategic significance is usually local, tacit and complex, and it is not freely available. Knowledge and innovation networks intensify the exchange of this often personalized and un-codified knowledge (e.g. Hansen 1999, 2002). However, there are also other reasons for networking than knowledge exchange. Companies concentrate on their core competences and seek for collaboration with companies that complement these competences in an optimal way (e.g. Prahalad and Hamel, 1990). Acquisition of needed resources or striving for sharing and minimizing risks are also drivers for networking. For technology strategy reasons companies with short life-cycle products may consider collaboration possibilities with companies with long life-cycle production technology and vice versa. Moreover, company networks are also established to satisfy complex customer needs. A network referred as an extended enterprise is responsible for the whole value chain and life-cycle of the product (Ranta, 1998, Browne and Zhang, 1999). These kinds of networks often have manufactures as well as service providers as network partners. Furthermore, new information and communication technology driven business models create inter-organizational networks of, for example, technology and service providers.

In summary, the main goals of networked organizations are to efficiently produce the products and services, new knowledge and innovations in accordance with the shared vision of the network. The level of co-operation in the network relationships can vary in intensity, from coincidental to continuous operational level co-operation and further to strategic co-operation with a common strategy. From organizational behavior point of view, networking influences the communication and knowledge sharing practices, as well as leadership and management culture of the organizational units involved in networking. Networking requires understanding and developing of new ways of collaboration that emphasize the significance of communication, knowledge sharing and trust and trustworthiness in these network relationships.

3 Material and Methods

Inductive case study research was selected as the research approach, because the study aims to get an understanding about a research topic that has not so far extensively studied (Eisenhardt, 1989, Yin, 1989). A variety of organizational networks from different industries were studied (Table 1). Three organizational networks were from electronics industry (Cases A, B and C), one from manufacturing industry (Case D), and one case study dealt with museum organizations (Case E) (Järvenpää and Immonen, 1998, 2002, 2003, Järvenpää and Mäki, 2001, 2002, Ranta et al. 1998). All the organizational networks can be defined knowledge-intensive. Knowledge-intensive organizations refer here to organizations characterized by the importance of knowledge in activities, a high amount of knowledge workers, and an extensive use of information and communication technologies (Järvenpää and Immonen, 2002).

Table 1. Case studies.

Case	Industry/Products	Knowledge	Network relationship	Data sources
Case A	Electronics/ Large scale technological products for industry	Design, Production logistics, Customers' business	Central company and its 2 suppliers	3 group discussions (for about 15 employees); Organizational documents
Case B	Electronics/ Large scale technological products for industry	Design, Production, Customers' business	Customer relationship	Thematic interviews (case company, n=9 and customer company, n=8); Organizational documents
Case C	Electronics/ Manufacturing services	Design, Production, Customers' business	Internally networked company	Questionnaire (n=94, response rate 58,5%); Organizational documents
Case D	Manufacturing/ Large scale industrial production machineries	Design, Production, Customer's business	Customer relationship	Thematic interviews (case company, n=31 and customers, n=4); Organizational documents
Case E	3 museum organizations	Cultural heritage, Arts, Ethnology, History	2 museum organizations, one independent museum	Thematic interviews (museum managers, n=5, museum employees, n=3); Organizational documents

Case A in electronics industry consisted of a big central company, and its two suppliers. The data were collected by three group discussions with participants from the central company and the supplier companies (n= about 15 participants). The participants were responsible for production and logistics in their companies. In Case B in electronics industry 17 employees were interviewed, 9 of them were from the main company and 8 from the customer company. The interviewees were working in customer interfaces of both companies. The Case C in electronics industry produced manufacturing services, and was an intra-organizational network consisting of five independent sites. A questionnaire survey about management of the network organization was directed to managers. The case D dealt with collaboration between a manufacturing company and its four customer companies. 31 employees from the main company and 8 employees from four customer companies were interviewed. Most of the interviewees were project managers and designers. Case E consisted of three

museum organizations, and 8 of the museums belonged to one museum organization, and 3 of them to another museum organization, and one was an independent museum. Five museum managers and three museum employees were interviewed.

In industrial networks the knowledge expected to be shared dealt with design, products, production, logistics, customers and market. In museum networks the knowledge dealt with all the special knowledge about cultural heritage the employees possess, create and modify in their work. The amount and quality of co-operation within and between organizations was used as the indicator of knowledge sharing.

In case studies A, B, D and E the data were colleted with thematic interviews dealing with knowledge sharing, problems in knowledge sharing, and network co-operation. In cases B and D customer relationships were the special interest. In Case C, a questionnaire survey (n=94 managers, response rate 58,5) was used to collect data about management of the network organization. Moreover, organizational documents about the network members and their co-operation were used as additional data in all case studies. Organizational documents included annual reports, organizational charts, company www-pages, and presentations of organizations' activities.

4 Results

In all the studied organizational networks knowledge sharing activities were identified. The knowledge to be shared in the industrial cases concerned design, production and customers' needs. In the museum network case the knowledge that was shared, diffused and transferred dealt with cultural heritage (Table 1). However, the amount and intensity of knowledge sharing and co-operation varied across different kinds of networks. Industrial and customer relationship networks seem to be denser than non-profit museum networks. In industrial networks knowledge sharing was found to be more frequent and systematic than in museum networks. Knowledge sharing was most frequent and intensive in customer relationship type of networks, where knowledge was shared in regular meetings, and weekly by email and phone calls. Personal relationships between employees in the case organization and the customer organizations were found to be important for knowledge sharing and trust, and strong tie relationships were identified between the employees of the network member companies. In other industrial networks, knowledge sharing was found to be quite frequent. However, the knowledge needs of the other parties were not well understood, and therefore, knowledge flow between organizations was not as fluent as needed. The reason for this seemed to be insufficient understanding of the other party's business.

As a consequence, network parties were reluctant to share knowledge about production schedules, forecasts, etc. In museum networks, knowledge sharing was coincidental, not systematic. It was based on good personal relationships, common professional interest, and common artistic approach. As obstacles of knowledge sharing were identified lack of professional confidence, internally oriented organizational culture and lack of trust.

In intra-organizational network organization trust, organizational culture and defined roles and responsibilities were identified as enablers for knowledge sharing (Table 2). In intra-organizational, as well as in inter-organizational production and customer networks unclear roles and responsibilities and lack of trust among the network members caused problems in co-operation and knowledge sharing. Network structures are complicated with network members from different organizational units and organizations. Individual network members might encounter different role expectations in their home organizations as in the network. Moreover, strong ties of the network are often organizationally recognized and defined but the weak ties may function on more informal basis. These weak ties that are very important for knowledge sharing are more likely the source of unclear roles and responsibilities than the more formal strong ties of the network. Trust among the network members, that is important in all types of network, is closely related to the shared vision of the network and to the reliance on that the shared knowledge will not be used against the knowledge provider.

The networks differed in terms of individual and organizational ties the network members had build. In museum networks and in customer relationship networks strong ties were identified, and they were found to be important in knowledge sharing. For museum networks knowledge sharing was mainly based on strong ties, and hardly any organizational level co-operation was identified. In customer networks knowledge sharing took place on organizational level, and regular knowledge sharing procedures were established. However, strong inter-personal ties were reported to be very important in sharing of confidential knowledge and in decision-making and problem solving. In industrial networks, organizational level ties seemed to be more common than individual level ties. This may be due to the goals of the network as a production network that produced a common product. Thus, the network needed to reach its goals despite of relationships between individual workers.

Table 2. Enablers and obstacles of knowledge sharing in organizational networks.

Enablers/obstacles for knowledge sharing	Inter-organizational network/ Production network	Inter-organizational network/ Customer relationship networks	Intra-organizational network/ Production network	Inter-organizational knowledge network/ Museum network
Professional competence	X			X
Understanding of partner's business	X	X		
Organization culture			X	X
Roles/responsibilities	X	X	X	
Individual and network goals	X	X	X	X
IT tools	X	X		
Personal contacts	X	X		X
Trust	X	X	X	X
Confidentiality	X	X		

The goals of individual member organizations and the entire network were sometimes conflicting, and this seemed to disable knowledge sharing. This came out both in industrial networks and museum networks. In industrial networks, each company was first of all interested in reaching its own business goals, and did not enough take into account the other network partner's goals. In museum networks the focus was even more on the own activities, and accordingly, the museums were not even aware of all the potential of the network co-operation.

Understanding of the business of other member organizations was an important enabler for knowledge sharing, especially in inter-organizational industrial networks. In most cases, knowledge sharing was based on trust, personal contacts and shared view of roles and responsibilities. Recognizing the professional competence was especially important in knowledge based museum networks. Moreover, in museum networks, as well as in intra-organizational production network the organizational culture that encourages to knowledge sharing was recognized as an enabler of knowledge sharing. The companies were critical in sharing of confidential information with their network partners, especially in inter-organizational production and customer networks. Compatible IT systems facilitated knowledge sharing in industrial and customer relationship networks.

Comparison of enablers/obstacles of knowledge sharing and their relation to dimensions of social structure forming social capital indicate that relevant information

was related to professional competence, understanding of partner's business, shared goals and organizational culture (Table 3). When network members perceived the other members as professionally competent, and understood their business, they were more willing to share knowledge. Moreover, personal contacts and confidentiality provide the basis for information exchange. Solidarity or social support was related to roles and responsibilities, shared goals, and to personal contacts and trust. Defined roles and responsibilities create stability in network relationships and together with the understanding of shared goals increases the experienced support from the network. Influence and control was related to personal contacts and trust, as well as to organization culture and shared goals. One enabler of knowledge sharing, not directly related to dimensions of social structure was IT tools. However, IT tools are very important in virtual environments for information exchange.

Table 3. Knowledge sharing and dimensions of social capital benefiting the performance of organizational networks.

	Dimensions of social capital		
Enablers/obstacles for knowledge sharing	Information	Solidarity/ Social support	Influence and control
Professional competence	X		
Understanding of partner's business	X		
Organization culture	X		X
Roles/responsibilities		X	
Individual and network goals	X	X	X
IT tools	?		
Personal contacts	X	X	X
Trust		X	X
Confidentiality	X		

The results also show some clear implications for network management from the viewpoint of knowledge sharing. Inter-organizational business networks differ from other types of networks in that understanding of partner's business, information technology (IT) tools and confidentiality are more important enablers for knowledge sharing than in other networks. Inter-organizational networking requires information technological support and mutual protocols for communication and information exchange. On the other hand, to share the knowledge of strategic importance requires trust and confidentiality. The information concerning a company's business is usually of strategic importance. Thus, trust and confidentiality helps you to get more information about your network partner. But the connection might work also the other way round.

The more you understand your partner's business through durable contacts, as you should in a business relationship, the more likely you are assessed as a trustworthy partner. So, from the management point of view, in inter-organizational business relationships the information flow should be kept timely and accurate, and the interactions should be repeated enough in order to create social solidarity and trust.

In non-profit network and intra-organizational network organizational culture is a distinctive enabler for knowledge sharing. This is related to organizational practices and also rewarding of information dissemination within and between the organizations. Open communication culture enhances free information flow. But before you can develop the communication culture of a network you need to get the network members to realize the benefits of shared information and knowledge. This is much a question of management's competence to communicate the purpose and strategy of the network to the network members.

5 Discussion

Our study identified the relationships between knowledge sharing and social capital according to three dimensions of social structure applicable to organizational networks. These dimensions were the information sharing in the network, the repeated interaction among the network partners, and the influence and control over others and freedom from control of others. The enablers and obstacles for knowledge sharing could be rather clearly related to information, influence and control as well as social support. Several enablers or obstacles of knowledge sharing were related to each dimension of social structure. This may also give more insight for why there are different types of social capital and how social capital is utilized for different goals. Thus, our findings may indicate both theoretical and practical considerations for future research and social capital development in organizations and organizational networks.

Our findings indicate that knowledge sharing, especially enablers and disablers of knowledge sharing and dimensions of social capital defined by Sandefur and Laumann (1998) are related to network management as follows (Figure 1).

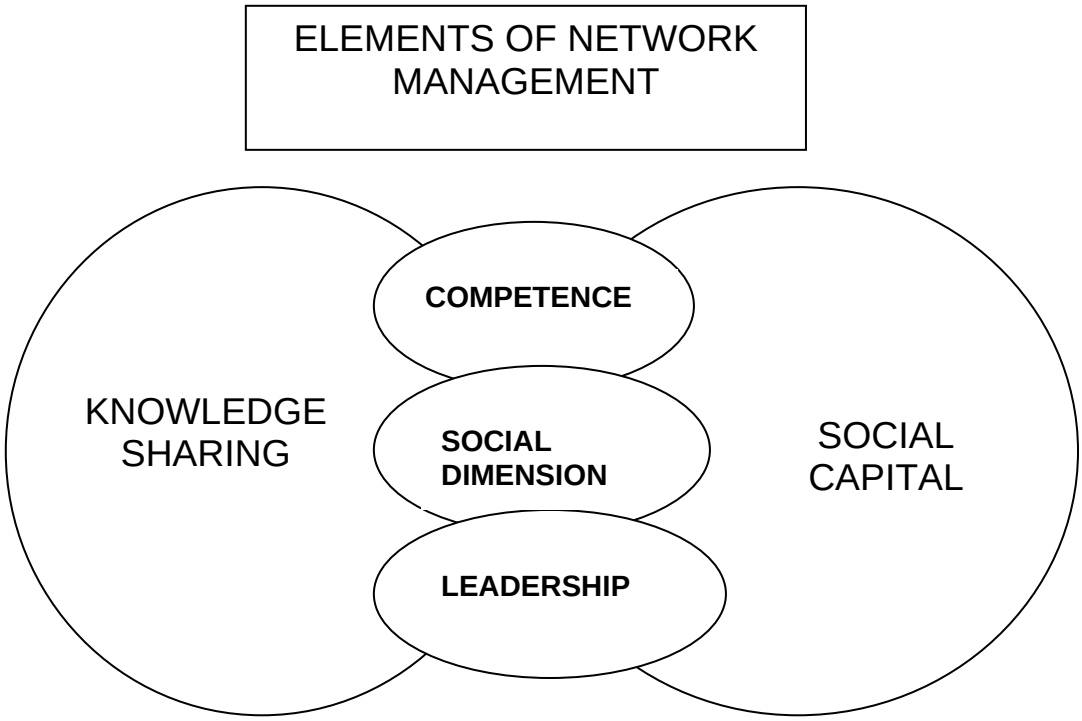

Figure 1. The initial model of the elements of network management

Dimension of social capital "information" was found to be related to professional competence, understanding of partner's business, individual and network goals, personal contacts and confidentiality. All these factors can be seen to be related to competences, either individual or organizational competences. Thus, we call this this dimension of network management as "competences". High competences both on individual and organizational level may promote collaboration in networks and reaching their common goals.

The second intersection between knowledge sharing and social capital consists of social capital dimension of solidarity/social support and roles and responsibilities, individual and network goals, personal contacts, and trust. As this dimension describes social aspects of network management, we call it "social dimension". Social dimension may be related to social ties between the employees of the network members, as well as their formal and informal roles and responsibilities in organizational networks.

The third intersection between knowledge sharing and social capital deals with influence and control and organizational culture, individual and network goals, personal contacts and trust. This dimension is called "leadership", and it is expected to be

related to leadership and management of organizational networks. As leadership in general, leadership of organizational networks should include goal setting, influencing organizational members, in this case network members, and creating the culture and atmosphere for performing activities.

Our model is the initial attempt to conceptualize elements of network management based on our case studies. The testing and verification of the model needs more data, and especially quantitative studies conducted in a variety of organizational networks. In our studys, some of the dimensions of knowledge sharing were related to several dimensions of social capital. As the organizational networks include complex business and social structures, the dimensions may in fact correlate to several dimensions of social capital. On the other hand, more precise quantitative studies with large samples of different kinds of organizational networks may be able to separate the dimensions.

From the viewpoint of knowledge management a limitation of our study is that we did not focus on the explicit or tacit dimensions of knowledge. We handled the knowledge on more general level. Based on this limitation we did not deal with the means or media of knowledge sharing. Thus, the considerations on information and communication technology applications are excluded from this study.

Based on findings of this study, we can assume that in knowledge management, and social capital development in organizational networks, different dimensions of social capital may need different kinds of development and managerial efforts. The study showed that different kinds of networks had different kinds of knowledge sharing needs, and also different approaches to enablers or obstacles of knowledge sharing. Through the dimensions of social capital the effectiveness of these enablers may be intensified. Our initiative model may help also managers in developing and focusing their network management efforts.

Our study also showed the importance of the type of the network ties. Strong and weak ties benefit the network in different ways and they also have different roles in network performance. Moreover, business relationship networks are different from knowledge networks and thus use different type or different dimensions of social capital. These findings have also implications for network management. The definition of social capital by Sandefur and Laumann (1998) does not emphasize network ties as a very important dimension of social capital. However, our findings show the role and importance of strong and weak ties in organizational networks. Therefore, the findings indicate that the characteristics of network ties are an important element of social capital in organizational networks.

Our cross-sectional study of organizational networks pinpointed some dynamic elements of networking that should be further studied from the viewpoint of the life-cycle of a network relationship. Moreover, future research on knowledge sharing and social capital should concentrate more precisely on different kinds of enablers and obstacles of knowledge sharing as well as different dimensions of social capital. For organizational networks the understanding of multidimensionality of enablers and obstacles of knowledge sharing and intangible capitals is especially important. Organizational networks are complicated organizational forms that are difficult to manage, and the understanding about the underlying dynamics may promote management efforts.

6 References

Burt, R. (2000): Structural Holes versus Network Closure as Social Capital. In N. Lin, K. Cook and R. Burt (eds.) (2001): Social Capital: Theory and Research, 1-27.

Browne, J. and Zhang, J. (1999): Extended and virtual enterprises – similarities and differences. International Journal of Agile Management Systems, 1, 1, 30-36.

Caddy, I. (2001): Orphan knowledge: The new challenge for knowledge management. Journal of Intellectual capital, 2, 3, 236-245.

Carney, M. (1998): The Competitiveness of Networked Production: the Role of Trust and Asset Specificity. Journal of Management Studies, 35 ,4, 457-479.

Colemann, J. (1988) Social capital in the creation of social capital. American Journal of Sociology, 94, 95-120.

Davenport, T.H. and Prusak, L. (1998): Working Knowledge, How Organizations Manage What they Know. Harvard Business School Press.

Edvinsson, L. and Malone, M., (1997): Intellectual Capital. Realizing your company's true value by finding its hidden brainpower. New York: HarperBusiness.

Gupta, B., Lakshmi, L.S. and Aronson, J.E. (2000): Knowledge management: practices and challenges. Industrial management and data systems, 100, 1, 17-21.

Hansen, M. (1999): The search-transfer problem: The role of weak ties in sharing knowledge across organizational subunits. Administrative Science Quaterly, 44, 1, 82-111.

Hastings, C. (1995): Building the Culture of Organizational Networking. International Journal of Project Management, 13, 4, 259-263.

Hyötyläinen, R. and Simons, M., (1998): Management of strategic company network. In M. Ollus, J. Ranta and P. Ylä-Anttila (Eds) Revolution of networks – How to manage a network company? Helsinki: Sitra, 63-13

Ichijo, K., von Krogh, G. and Nonaka, I. (1998): Knowledge enablers. In v. Grogh, G., Roos, J. & Kleine, D. (Eds.) Knowing in firms. Understanding, managing and measuring knowledge. London: Sage Publications, 173-203.

Järvenpää, E. and Immonen, S. (1998) Leadership and managements of company networks (Verkostojen johtaminen ja hallinta). M. Ollus et. al. (Eds). Company networks - competion using knowledge, speed and flexibility. (Yritysverkostot – kilpailua tiedolla, nopeudella ja joustavuudella). In Finnish. Helsinki: Sitra, pp. 61-89.

Järvenpää, E. and Immonen, S. (2002): Dynamics of knowledge intensive organizations: knowledge work, leadership and organizational networks. Helsinki University of Technology, Industrial Management and Work and Organizational Psychology, Working paper no. 28. (In Finnish).

Järvenpää, E. and Mäki, E. (2001): Knowledge sharing in networked organizations. N. Bontis (Ed.) World Congress on Intellectual Capital Readings. Boston: Butterworth Heinemann, 374-383.

Järvenpää E. & Mäki, E. (2002) Knowledge management and customer relationships management: management of customer feedback. Proceedings of the Third European Conference on Organizational Knowledge, Learning, and Capabilities - OKLC 2002. April, 5-6 2002, Athens, Greece.

Nahapiet, J. and Ghoshal, S. (1998): Social Capital, Intellectual Capital, and the Organizational Advantage. The Academy of Management Review, 23, 2, 242-266.

Polanyi, M. (1966). The tacit dimension. Garden City: Doubleday & Company.

Prahalad, C. and Hamel, G. (1990): The core competences of corporation. Harvard Business Review, May-June, 79-90.

Putnam, R. (1995): Bowling alone: America's declining social capital. Journal of Democracy, 6, 65-78.

Pyka, A. (2002): Innovation networks in economics: from the incentive-based to the knowledge-based approaches. European Journal of Innovation Management, 5, 3, 152-163.

Ranta, J. (1998): Networks and network companies – competition with time, speed and flexibility. In M.Ollus, J. Ranta and P. Ylä-Anttila (Eds.) Company networks - competion using knowledge, speed and flexibility, (In Finnish), Helsinki: Sitra, 8-27.

Ritter, T., Wilkinson, I. and Jonhston, W. (2004): Managing in complex business networks. Industrial Marketing Management, 33, 175-183.

Sandefur, R. and Laumann, E. (1998): A paradigm for social capital. Rationality and Society, 10, 4, 481-501.

Teece, D. (1998): Capturing Value from Knowledge Assets: The New Economy, Markets for Know-How, and Intangible Assets. California Management Review, 40, 3, 55-79.

Teece, D., Pisano, G. and Shuen, A. (1997): Dynamic capabilities and strategic management. Strategic Management Journal, 18, 7, 509-533.

Tsai, W. and Ghoshal, S. (1998): Social capital and value creation: The role of intrafirm networks. Academy of Management Journal, 41, 4, 464-476.