Influence of social network positions on knowledge sharing within the organization: A case study
Abstract

In today’s turbulent business circumstance, organizations’ ability to sustain their growth and competitive advantage depends on how well they manage their capital of knowledge. Recognizing that knowledge is a key factor to the success of the company, companies are evolving practices to facilitate the creation, acquisition, storage, utilization, especially the sharing of knowledge assets.

The theoretical problem of this paper is that the change of organizational model, which is more flexible, team-oriented and more reliant on knowledge assets, has influenced nowadays organizations deeply. Another development is the discovery of the importance of the organizational informal structure, which coexists with the organizational formal structure. Employees within organizations interact with each other not only in a myriad of ways, but also in a way of social relationships. However, with this shift of today’s organizations to more-organic, network-like structures, there is a great need to understand how knowledge is shared within these structures and how to manage it.

The aim of this paper concludes with the insights of how employees’ network positions are related to knowledge sharing within the organization, and how the organization could better leverage individual in these critical positions, so to ensure that knowledge in organization shared with unobstructed communication, cooperation, and reduce the costs of bridging inside the organization.

This study is a case study conducted in a Swedish company with a qualitative research strategy based on the structural holes theory, and 12 employees were interviewed. The empirical findings are that we found senior manager becomes peripheral, fear of losing power makes knowledge sharing baffling, and the hub position in network is a double-edged sword, which means that the employees’ network positions may bring competitive advantages for the employees or the whole organization, but sometimes it may press employees in a hub position too much.

Keywords: Knowledge sharing, Network position, Knowledge management, Structural holes.
Acknowledgements

As I have experienced in the last several months, writing a master thesis can be a trying endeavor. I still remember when I printed this paper out, it was raining heavily outside. And the paper in my hand was like a new baby born and I felt so moved because of these several months’ hard work.

Therefore I would like to begin my list of acknowledgements by thanking my supervisor, Osama Mansour, who is patient and helpful for answering my questions, and also for his months of support and for giving me the constructive advice and valuable feedbacks. I would also like to thank Päivi Jokela and Anita Mirijamdotter, examiners of my thesis, and other professors, in the DFM department of Linnaeus University in general for their critical and valuable comments.

Furthermore, I would thank Niklas Malmros, Tomas Eriksson, Yuting Fang, Yuhan Zhao, and other employees for helping me with the statistical parts of this thesis. Thanks to Dongyong Du, for being like a brother to me and for his good suggestions.

In the end, I would like to thank my parents, friends, especially my girl friend, who are the fundaments of my life and without whom I would be able to do nothing.
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1. Introduction

1.1 Motivation

As the world moves from the industrial age to the information age, knowledge is becoming a fast increasing competitive advantage and prime facilitator behind the competitiveness and success of global organizations (Mason, 2007; Moffett, et al., 2003; Lawton, 2001). In the emerging new economy, knowledge, rather than financial capital, land and labor are seen as the main sources of competitive advantage of business organization (Drucker, 1993; Stewart, 1997). The successful employees in organizations constantly updates their knowledge to remain abreast of new advanced technologies, changes in organizational strategies, and current affairs in other organizational units (Major et al., 2007). A very important way to be informed in such a manner is to facilitate one’s social networks. Since knowledge is shared through these networks, so employees could stay attuned to the organization’s mission and gain not only explicit, but tacit organizational knowledge (McCluskey & Korobow, 2009).

Knowledge is shared within organizations, and knowledge network is a special linkage mechanism built up along knowledge activities, such as knowledge creating, sharing, learning, applying, communication and innovation. The potency of social networks comes from the social capital they embody. Based on Burt (2005, p.4), social capital “explains how people do better because they are somehow better connected with other people”, and it also refers to the advantages an individual obtains via being connected to others. This advantage is created by an individual’s location in the structure of network relationships.(Burt, 2005) Therefore, as employees in organization, their performance is likely to be affected by their social network positions, a relationship which seems to remain largely unexplored to date.

In this regard, our study is aimed to investigate how employees’ network positions are related to and influence knowledge sharing within organizations. We did a case study in a Swedish company, which have 1300 employees, and produce and manage information, such as documentation assignments, information management system, engineering services, and
software support. This study may help organizations and their employees better understand how they leverage critical network position and how their network positions are set in order to improve knowledge sharing process.

1.2 Previous studies and research problem

In the organizational management field, the growth of social network theory has been supported by several important developments in the business world. First of all, the change of organizational model, which is more flexible, team-oriented and more reliant on knowledge assets, has influenced nowadays organizations deeply. Another development is the discovery of the importance of the organizational informal structure, which coexists with the organizational formal structure. Employees within organizations interact with each other not only in a myriad of ways, but also in a way of social relationships. However, with this shift of today’s organizations to more-organic, network-like structures, there is a great need to understand how knowledge is shared within these structures and how to manage it.

Previous research on knowledge sharing has drawn upon a wide range of theories of different perspectives, including social exchange theory, social capital and network theories, and so forth. Based on the research of knowledge sharing literature, those two kinds of theories were the most commonly used theoretical perspectives used to study knowledge sharing (Sheng and Raymond, 2010). However, over 20% of the previous studies that we reviewed here did not explicitly ground their research in any theory.

Burt (2005) argued that individuals whose network ties bridge the holes “are brokers rewarded for their integrative work. They are rewarded in the sense of more positive individual and team evaluations” (Burt, 2005, p.7). Previous research showed that people who can effectively span structural holes gain more advantages. Loan officers that span structural holes within networks were shown to be more likely to bring a deal to closure (Mizruchi & Sterns, 2001). Managers who span the structural holes are more likely to be promoted early (Podolny & Baron, 1997). Ahuja (2000) argued that if employees bridge structural holes between otherwise disconnected individuals or groups they allow knowledge and information to be exchanged more effectively within a broader network. Mehra, Kilduff, and Brass (2001)
found that officers in a small technology firm gave higher performance evaluations to their employees whose networks bridged otherwise disconnected parts of their organizations. In a French chemical firm, reward of increasing salary were more likely for individuals who span structural holes (Burt et al., 2000). These people are able to access more knowledge by being exposed to more new and varied bits of information, and in turn become more effective employees (Burt, 2005).

Based on previous studies of structural holes theory, the more employees bridging structural holes the more likely different types of knowledge may be shared. Burt (2005) explained it more in detail that his social capital argument emphasized the importance of open rather than closed networks. Therefore, it would be quite interesting to investigate how employees’ network positions are related to knowledge sharing and how organizations may better leverage individuals in these critical positions, based on structural holes theory in Swedish case.

1.4 Aim and research questions

The base of this paper is the structural holes theory (Burt, 1992), the more employees bridging structural holes the more likely different types of knowledge may be shared. The aim of this paper is to study the potential relationship between network position and knowledge sharing, and examine how knowledge sharing could be improved by re-organizing the social networks.

In order to achieve this aim, the research seeks to answer the following question:

“How employees’ network positions influence knowledge sharing within organizations?”

1.5 Delimitations

The objective of this research is to focus on employees’ experience about knowledge sharing regards to their network positions and not to go with any
technical aspects of knowledge sharing or knowledge networks. One limitation of this research is that it is based on a single case study, which will be quite hard to generalize (Creswell, 2009), while the single case study can help us in deeper and richer insights about the topic. Another limitation is that distributed and far-distance geographical locations of some of the interviewees that make it hard for researchers to have face-to-face connections with them over the interview.

1.6 Target audience

As a result of this research we may help managers and employees in organizations to get a deeper insight of the research problem. These issues are dealt with from different aspects of knowledge sharing and considering social network and positions to help information system or knowledge management system designers to design a beneficial system considering social network positions. Applying the structural holes theory to the issue of organizational knowledge management is helpful for upgrading the network structure and improving knowledge management. As a result of this research the organization’s managers also can gain deeper and new insight of sharing knowledge in their company and department. It may be a contribution for the manager to make improvement in their organizations policies to encouraging knowledge sharing in the organization.

1.7 Disposition of the thesis

This paper starts with chapter 1, the introduction of master thesis and its topic. Then, the topic and research problems are explained further. Also, the previous studies are listed which describe some related works and projects similar to the subject of this master thesis. The aim and research questions are described based on the research problem and delimitation and target audience are discussed at the end of this section. Chapter 2 illustrates the central concepts of the thesis and literature reviews that are related to the subject, which are knowledge and knowledge management, knowledge sharing and barriers, and social networks. Furthermore, in chapter 3 explain the social exchange theory and social capital and network theories, especially the structural holes theory, which is the base of this thesis. Chapter 4 gives
information about the case study and qualitative research methods, including philosophical worldview, data collection and analysis methods, ethical issues and so forth. Then the results and findings are discussed in chapter 5. This section consists of the main findings from the interview and observation of the company, thus to enrich the theoretical basis of the thesis. And describe the formal and informal structure in the company, and explain how knowledge sharing are related social network positions in the company, and how company better leverage the critical individual position to make the whole organization function better, and the evaluation of results is also stated in this chapter. Finally in section 7, the discussions and conclusions about the subject and what can be done for a future work are stated.
2. Literature Review

2.1 Knowledge and knowledge management

Knowledge is the key concept in this thesis. Nonaka (1995) describes two new definitions of knowledge, tacit knowledge and explicit knowledge. Tacit knowledge is also viewed as subjective knowledge, which is gained and coded by the person’s experiences and thoughts. And it is hard to transfer and share. However, explicit knowledge is also viewed as objective knowledge, which is verbally explained, codified or written down in a specific document. A detail of codified processes and procedures is explicit knowledge. Furthermore, this knowledge refers to the experiences, education and all the information inside the mind of people. Scarbrough (1999) defines and interprets that explicit knowledge is the knowledge available in physical form. And it can be recorded on many mediums. Explicit knowledge is increasingly being emphasized in literature and practice, as a management tool to be exploited for the manipulation of organizational knowledge. Intranets, knowledge repositories, groupware, knowledge action networks, list servers, and database management allow the sharing of organizational knowledge (Scarbrough et al. 1999). Explicit knowledge is more tangible than the tacit knowledge. And it resides in the heads of the people is difficult to capture. It is very important to understand the nature of the organizational knowledge in order to know the values that knowledge can bring to the company (Bhardwaj and Monin, 2006).

A number of concerned literatures of the respected fields of IT, social sciences, applied sciences and so on, have contributed to knowledge management a lot. These are five key stages of knowledge discovery, knowledge generation, evaluating knowledge, sharing knowledge and leveraging knowledge within a corporate culture of organization and with the help of high up to date IT tools and models (Jashapara, 2004). Each of the stages outcomes serves as an input to the next stage for the development of better understanding on knowledge management, both tacit and explicit knowledge, organizational capital, single loop learning, which is efficiency, and double loop learning, which refers to innovation.
Gupta et al. (2000) defined knowledge management as a process which helps organizations in selecting, searching, organizing and transforming information, knowledge and expertise to support organizational necessary activities, for example, aiding companies in problem solving, strategic planning, or decision making and so forth (Gupta, et al., 2000).

From an interdisciplinary perspective, knowledge management can be defined as: ‘the effective learning process associated with exploration, exploitation, and sharing of human knowledge (tacit and explicit) that use appropriate technology and cultural environments to enhance an organization’s intellectual capital and performance.’ (Jashapara, 2004).

Jashapara (2004) define that knowledge management is at the foundation of organizational learning. At this point and from organizational learning’s aspect, knowledge management defined as the process of managing knowledge. As such, knowledge management limited to the activities that do not add value to knowledge.

Knowledge management is also recognized as activities that aid creation, development, application, and sustainability of intellectual property in organization, which is defined as collective knowledge, experience, and associated intangible assets. (Roos, 2005; Marr, et al., 2003; Teece, 2000)

To put them together in order to comprehend the definition of knowledge management; the effective learning processes that includes the Double loop learning, Single loop learning and sharing of knowledge (Community of practice, four “bas” tacit and explicit knowledge model analysis) by involving the up to date technological instruments (Knowledge management resources and Equipments, data warehouse and data mining), leader and leadership (decision making), cultural environments (norms, values) to improve the organizational intellectual capital and organizational performance (Jashapara, 2004).

2.2 Knowledge sharing and knowledge sharing barriers
Knowledge sharing is the central theoretical concept used in this study and it plays a crucial role in bringing competitive advantage for the companies. It allows companies to exploit and use the knowledge-based resources effectively (Cabrera, 2005; Damodaran and Olphert, 2000). There also exist a lot of benefits that knowledge sharing gained for the organizations, such as improving team performance, promoting company innovation capabilities, reducing product cost, enhancing firm performance, etc. (Collins and Smith, 2006; Mesmer and Dechurch, 2009).

However in most cases knowledge resides within people and it is hard to be transformed quickly and easily into organizational knowledge repository and shared with other people in the organization (Bock, et al., 2005). Many organizations depend on staff training system to help employees acquiring specific knowledge, abilities, skills and competencies, which is not sufficient for knowledge sharing (Brown and Duguid, 1991). Because of lack of consideration of interpersonal and organizational context, individual characteristics influence and any other aspects, some knowledge management system with knowledge sharing process failed (Babcock, 2004; Voelpel, et al., 2005).

Sheng and Raymond (2010) systematically analyze the knowledge sharing research factors and they articulated that successful knowledge sharing approach may consider many factors, including environmental factors, motivational factors, individual characteristics and perceptions related to knowledge sharing and so forth (Sheng and Raymond, 2010).

Previous research about knowledge sharing focused on organizational context, interpersonal and team characteristic, cultural characteristics, motivational factors, and individual characteristics (Sheng and Raymond, 2010). Many case studies have shown plenty of examples related to those factors, for example, how organizational culture and climate affect knowledge sharing, trust between employees and subjective norms that encourage knowledge sharing within organization are two aspects (Kankanhalli, et al., 2005; Bock, et al., 2005). Yao, et al. (2007) stated that lack of incentives, such as promotion, bonus, and higher salary, which are viewed as organizational rewards, is a major barrier to knowledge sharing across culture. Not only incentives barrier, but organizational structure affects knowledge sharing a lot. Jones (2005) argued that the use of open workspace,
which will make the organizational structure less complex, could facilitate knowledge sharing. Strong or weak relationships among employees could also influence sharing in organizations (Reagans and McEvily, 2003). Social networks, for example, the community of practice (Jashapara, 2003) is a good knowledge sharing approach that facilitates employees through faster knowledge transfer and enhance the quality of information received (Reagans and McEvily, 2003).

There are many other knowledge sharing barriers. For example, employees feel they will lose their power and superiority if they share their core knowledge with others. So in order to survive, they are reluctant to share knowledge with others (Kim and Mauborgne, 1998). Employees want to impress their boss, so they share knowledge with their supervisors and managers to get better opportunities (Bolino, 1999). Language barriers that make knowledge sharing difficulty to be conducted; gender barriers that make the minority of gender, for instance, female employee hard to share with other male employees; competitive team barriers that make team members keep their knowledge and reluctant to share, while cooperative team encourage team members to actively sharing knowledge.

According to Sheng and Raymond (2010), researchers tended to investigate the relationship between contextual factors, individual characteristics and knowledge sharing directly, analyzing how these factors affect the sharing process, while few researchers have examined their interaction. Tett and Burnett (2003) argued that interactional psychology, especially from the trait activation perspective, it is helpful to check how personality could interact with situational criteria to influence the knowledge sharing process. Future research about knowledge sharing also needs to be investigated with social exchange perspective, which can offer insights that have yet to be examined, like perceived benefits and costs as well as the effects of organizational trust and justice on knowledge sharing. Mayer and Gavin (2005) stated that more research should focus on potential mechanisms through which trust may affect knowledge sharing. From the strong and weak tie perspective, Hansen (1999) articulated that weak tie may be less likely or less willing to share complicated knowledge because they are unwilling to spend more time and effort for sharing knowledge. While strong tie and weak tie may influence knowledge sharing in different ways and situation, future research can focus
on the mechanisms through which social networks feature, such as the number of different ties and the tie strength related to knowledge sharing.

Another aspect that will influence sharing is the attitudes, which has been investigated broadly (Kwok and Gao, 2005). They found factors that have a positive influence on employees’ attitudes toward knowledge sharing. But there is a lack of research focusing on understanding how to enhance positive attitudes toward the knowledge sharing process.

There are lots of articles arguing a variety of barriers and problems when employees in organizations need and what to share their individual knowledge with others, from different perspectives and focusing on different aspects, not only individual factors, but team, organizational, even cultural factors, are all influence knowledge sharing in different ways. There is a good need for us to investigate more challenges, problems, barriers of knowledge sharing within organizations to help improving their sharing ability and create a better knowledge sharing environment.

2.3 Social network technologies

Emerging computer mediated technologies, like VOIP (Voice-Over-IP), instant messaging, video telephony, etc. have significantly affected our daily lives. Especially their lower cost of communication, compared with email, has made computer-mediated communication and knowledge sharing much richer. Although it is possible to talk to someone at the other side of the world easily at no cost beyond the basic internet connection fee, these technologies still cannot provide all the facilities that are available in face-to-face conversation. To make sure that the people whom you are talking with share the same interests and they can represent their identity to allow people find each other according to their unique relationship or group, social networking systems are created. The biggest difference between traditional and social media system are defined by the level of interactivity and interaction available to the consumer. For instance, a viewer can watch news on TV with no interactive feedbacks, while social media system provides mechanisms to allow consumers to comment, discuss, and even distribute the news (Salomon, et al., 2010).
Web users can interact and have a power to create, publish and promote their own content through social media system. Cass (2007) states that social media is so important that “it is easy to find individuals with the same interests by providing links to groups and communities and enable individuals to catalog content through activities, like tagging”. He also said that social network allows different people to create, contribute, describe and find content that are related to their interests, also build community, start and continue conversations to make knowledge sharing easily and relevantly (Cass, 2007). Not only in traditional social relationship, but business area, social media also plays an important role. Business today find social media use is no more the exception, but rather the rule (Salomon, et al., 2010). There are business units, like marketing, research and development, customer service, sales and human resource are realizing the potential benefits of using social media tools, to encourage innovation, generate revenue, improve customer satisfaction, create brand recognition, and hire and retain employees. So that is to say, social media is no longer just an option for the firms, but will lead in today’s business environment (Zahariadis, et al., 2011).

There are many types of social media tools: social networking sites such as MySpace and Facebook, image and video sharing sites such as YouTube and Flickr, blogs such as TypePad and WordPress, micro-blogs such as Twitter and Tumblr, and also business related and professional network sites such as LinkedIn. The common link between all forms of social media is that content is created and managed by individuals who leverage social media tools and platform provided by social media sites (Salomon, et al., 2010). There are many features of the social media system to facilitate knowledge sharing within companies, take LinkedIn for example, which has seen by capturing and promoting more business information in this community, it could make way for a lot more engagement and knowledge sharing (Linda, 2011). There are many good features within LinkedIn, one is “Support for video”, that there is a space to add a video on your service homepages as well as on each individual page, and it is great if you have a company video that you can take advantage of using. Another feature is “Get client recommendations and display them on your page”, which means you can have a ‘Recommend’ button placed on your website that can add to your corresponding business page in LinkedIn. The “Share” button, which is pretty much identical to that of the Facebook Share however it updated you LinkedIn. Other features like
“Follow us on LinkedIn” button, “New group function”, and so forth, are all contributions to knowledge sharing with social media tools (Tim, 2011).

2.4 Social exchange, social capital and networks

One of the previous theories used most commonly is the social exchange theory, which has been used to investigate perceived costs and benefits as well as the effects of organizational justice and trust on knowledge sharing. Multiple researches of knowledge sharing have focused on examining knowledge sharing from a social exchange perspective that can provide insights and identify the potential mechanisms through which trust may influence knowledge sharing (Mayer and Gavin, 2005). Trust issues of social exchange theories have been studies a lot based on the literature review, and it will be discussed in the theory part in Chapter 3.

Szulanski et al. (2004) argued that source trustworthiness helped to enhance knowledge transfer across units, and the perception of an individual being trusted by the recipient may also influence his/her motivation to share knowledge with this person. Jones and George (1998) gave the result that conditional and unconditional trust may have different relationships with knowledge sharing.

A lot of researches also focused on the theory of social dilemmas, which may help increase understanding of the conditions under which knowledge sharing is likely to occur. Knowledge sharing process using a Knowledge Management System (KMS) that facilitates a community of practice likely create a public goods social dilemma, for example, individual’s rational action is to maximize personal benefit, leading to damage to the collective (Cabrera and Cabrera, 2002; Kollock, 1998). And also Brown and Duguid (2002) argued that knowledge, such as ideas, experiences, shared in a KMS is considered to be public goods which are accessible to every member of the system and their value will not diminish with use. Only in this way that all employees may be motivated to “free ride” because of the availability of access to knowledge (the public goods), for example, Cabrera (2002) researched gaining the benefits of the ideas and knowledge shared by others without making a contribution to the KMS. Previous studies used social exchange perspective a lot, since it may be useful for the dynamic
development of trust as it relates to knowledge sharing. Anyway, social exchange theory will be further discussed in Chapter 3.

Several researches included in my review used social capital and network theories and perspectives. Based on the social capital framework, such as structural, relational, and cognitive dimensions (Nahapiet and Ghoshal, 1998), many researchers used other perspectives of social network theories such as the closeness of network and structural holes theories, which are relatively underutilized and may improve the understanding of knowledge sharing in teams and communities of practice (Brown and Duguid, 1998). Previous research focused on these theories because they recognize that employees do not learn, work, or share knowledge in isolation but are embedded in social networks. Today, many companies and firms support multiple communities of practice to help improve knowledge sharing processes and in this way can they contribute to organizational learning and innovation (Brown and Duguid, 1998).
3. Theoretical framework

3.1 Social exchange theory

Social exchange theory is the social psychological and sociological perspective that describes social change and stability as a process of negotiated exchanges between different parties. It proposes that social behavior is the result of an exchange process. And the purpose of this exchange is to maximize benefits and minimize costs. According to social exchange theory, the potential benefits and risks of social relationships are weighed. When the risks outweigh the rewards, people will abandon or terminate that relationship.

Motivation is a significant element in the discussion of knowledge sharing. Indeed, assuming that individuals are willing to just contribute their knowledge is a mistake (Davenport and Prusac, 1998). The social exchange literature (Coleman 1990) argued that self-interest is the key factor that drives many people’s actions. Social exchange occurs when a player (the source) contributes something to another player (the receiver), and the source player is motivated by the rewards which the receiver is expected to offer. Both the source and the receiver will consider the costs and benefits while sharing knowledge. Based on social exchange theory, the decision of the source to participate in the knowledge sharing process is determined by anticipated cost and profit. If the anticipated profit is much larger than the anticipated cost, then the source is more likely to carry out the knowledge sharing process.

Rewards are incentives and very important to source player, which can be social rewards, materialistic goods. Rewards are either internal or external. Internal reward is generated by oneself when helping them, for instance, sense of goodness and self-satisfaction. When seeing friends in distress, we may sympathize and may choose to help them in order to reduce the arousal and distress. The external reward is things that obtained from others when helping them, for example, friendship and gratitude. People are more likely to help those people who are more important and attractive, whose approval is desired.
3.2 Social capital and network theories

“Social capital is not what you know, it is who you know”. Sander (2002) argued that the folk wisdom that most people get their jobs from whom they know, rather than what they know, turns out to be true. Social capital refers to one’s ability to derive advantage from social relationships with others, and it also refers to the norms and networks that enable people to act collectively. Bourdieu and Wacquant (1992) defined it as follows:

“Social capital is the sum of the resources, virtual or actual, that accrue to an individual or group by virtue of possessing a durable network of more or less institutionalized relationships of mutual relationship and acquaintance.”

(Bourdieu and Wacquant, 1992)

Therefore, social capital comprises both one’s social network and the resources which can be obtained from the social network (Nahapiet and Goshal, 1998). And it focuses on the sources, rather than the consequences of social capital, Portes (1998) recognized that important features of social capital, such as trust and reciprocity are developed in an iterative process. Besides, this definition permits the incorporation of different dimensions of social capital and recognizes that communities can have access to more or less of them.

Social capital is related to the value of social networks, bonding individuals within organizations and bridging between diverse people, with the norms of reciprocity (Dekker and Uslaner, 2001; Uslaner 2001). And Dekker and Uslaner (2001) also argued that social capital is basically about how people interact with each other. Adler and Kwon (2002) identified that the key and core intuition guiding social capital research is that the goodwill that others have toward us is a valuable resource. Therefore they define social capital as the goodwill available to groups or individuals. Its source lies in the content and structure of the individual's social relations. (Adler and Kwon, 2002).

From a career perspective, some individuals have better performance than others. They have better ideas, faster careers and higher wages. Two ways could be used to explain this. Firstly the human capital approach sees these
differences as resulting from individual’s characteristics. People earning higher wages may be more skilled or more intelligent (Burt, 2000), while another is the social capital approach, which sees these advantages as resulting from the personal place in the social structure. It concludes that most successful people are better connected.

Nahapiet and Goshal (1998) suggested that social capital comes in three types: structural social capital, relational social capital and cognitive social capital, described in Figure 1 as follows:

Figure 1. Three types of social capital

a. Structural social capital covers the network structure of people’s interactions. It covers the creation and dissolution of social relationships and also the overall structure of the networks that are formed by these relationships.

b. Relational social capital covers parameters influencing relationships, like trust, obligations, norm and values, expectation and identity. These are elements which influence what will flow over the relationships. For example only employees within organizations will be willing to share a certain knowledge with employees they trust. Social capital resides in relationships, and relationships are often
created through social exchange (Coleman, 1990). Therefore, social exchange theory and relational social capital are closely related.

c. Cognitive social capital refers to the development of cognitive elements which allow communication and cooperation to occur between actors. This includes shared meaning, interpretations and representations. The concept of perspective making and perspective taking (Boland and Tenkasi, 1995) is relevant to cognitive social capital, as it denotes the mechanisms by which people gradually develop the ability to efficiently share knowledge.

Structural social capital is a general category and it includes different social network theories, such as the strength of weak ties (Granovetter, 1973), network closure (Coleman, 1990) and structural holes (Burt 1992, 2002). Relational and cognitive social capital are major variables which influence knowledge sharing. However, the main focus of my empirical research, described in chapters 5 and 6, pertains more to structural holes theory.

### 3.3 Structural holes and structural holes theory

Structural holes theory was originally put forward by Ronald S. Burt in 1992, and he gave the definition of the structural holes as non-equivalencies or disconnections between players in the arena (Burt, 1992). Burt changed the object of analysis from the resources of the network into the structure and distribution of the network, from ego into the connection between egos. His social capital argument emphasized the importance of open rather than closed networks, and he also argues that the network positions related with the highest benefit return lie between not within dense regions of social relationships, and the sparse regions are called structural holes.

Another perspective of structural holes theory is the cluster analysis. According to Burt (1992, 2001, 2004), access to the knowledge realms in different social network sub clusters is correlated with weak ties. It is true that weak ties often bridge holes in the knowledge network that procures the advantages of diversified social capital. He defined the hole in the knowledge network as an area between social clusters where no relationships exist. Different social clusters will contain different knowledge. Accessing these
clusters can gain different benefits, resulting from the ability to perform brokerage between the clusters. By synthesizing knowledge which exists in the different clusters, or by importing knowledge from one cluster into another, the person who bridges structural holes can get benefits that cannot be obtained by the people who just belong to one group. Beside, bridging relationship offers earlier access to knowledge in other clusters, thus gives the participants in the relationship a chance to recombine the new knowledge with their own and be innovative before others (Burt 2004).

Structural holes can be described and explained by a figure of relation network which is composed of four actors. An actor is connected to certain players, and is not connected to other actors. These disconnections between actors look like “holes” in a relation network. The actors who have structural holes have distinguished advantage in information and control. For instance, in Figure 2, actor A has three structural holes: BC, BD, and CD. And there are no direct connections between actor B, C and D, and only actor A connects with each of them directly. Therefore, actor A has distinctive advantages in getting the resources of network because other actors connect with each other by actor A. Figure 3 is a closed network and there are no structural holes in it.

![Figure 2. Structural hole](image)

![Figure 3. Closed network, no structural hole](image)

In order to get and develop the advantages in competition, individuals or organizations should establish wide connections with unrelated ones. Structural holes are companies’ opportunities for information access, referrals, timing, and control (Burt, 1992).
Burt’s theory is based on the idea that actors (employees or organizations) are in a better position to profit from their interactions and transactions with others if they are connected to others who are not themselves connected or well organized (Burt, 1992). The connections to other actors provide opportunities; the lacks of connections among those others are the so-called “structural holes”. Based on Burt’s theory, an actor has achieved structural autonomy the bottom line in structural holes theory, to the extent that his/her position is characterized by several qualities:

a. Her opportunities (connections) are surrounded by structural holes,

b. The actor himself/herself is not surrounded by structural holes.

Figure 4. Structural holes theories example
4. Method

4.1 Philosophical worldview

Qualitative research methods were developed in the social sciences to enable researchers to study cultural and social phenomena, and they are designed to help researchers understand people factor and the social and cultural contexts within which they live (Creswell, 2009). Qualitative researches are based on some underlying assumptions about what build up valid research and what kind of research methods are best suitable. For my purposes, the most pertinent philosophical assumptions are the related epistemology which guides me. Epistemology refers to the assumptions about knowledge and how it can be obtained in the organization (Hirschheim, 1992).

Following Chua (1986), there are three distinct epistemological categories: interpretive, positivist and critical. In most cases, qualitative researches can be positivist, interpretive or critical process. However, they may or may not be interpretive, depending on the underlying philosophical assumptions of the researchers. (See Figure 5).

![Figure 5: Underlying philosophical assumptions](image-url)
I use interpretive research to attempt to understand phenomena through the meanings that employees in the organization assign to them. And interpretive methods of research in information system and knowledge management context are aimed at producing an understanding how the employee’s network position related to knowledge sharing process in the organization, and the process whereby the KM influenced by the context (Walsham, 1993). And interpretive approach is selected because it allows phenomena to be understood from the involved employees (Cavaye, 1996).

4.2 Research strategy

Before talking about the method that is used in this research it is worthy to give a short explanation about the method of qualitative research. Qualitative research is a form of social inquiry that focuses on the way people interpret and make sense of their experiences and the world in which they live. The different approaches of qualitative research have almost the same aim to understand the social reality of individuals, groups and cultures. Researchers use qualitative approaches to explore the behavior, perspectives and experiences of the people they study. The basis of qualitative research lies in the interpretive approach to social reality (Holloway, 1997).

According to Creswell (2009), there exist several strategies of inquiry for doing an exploratory study that one of them is a case study. “Case study provides researchers with the possibility to explore in depth a program, event, activity, process or one or more individuals by using a variety of data collection procedures over a sustained period of time” (Stake, 1995 and Creswell, 2009). And also Cavaye (1996) argued that “Case study enables the capturing of reality and its detail by studying the phenomenon in its natural context and environment.” Another argument is offered by Miles and Huberman (1995), which is “Case study will provide the possibility for understanding the underlying and non-obvious issues” Case study research largely overlaps with historical analysis, but is characterized by two additional sources of evidence; systematic interviewing and direct observation (Yin, 1994). According to Yin (2003) a case study design should be considered when:
a. The focus of the study is to answer “how” and “why” questions.
b. You may manipulate the behavior of those involved in the study.
c. You want to cover contextual conditions because you believe they are relevant to the phenomenon under study.
d. The boundaries are not clear between the phenomenon and context.

Qualitative research is chosen for conducting this research because the aim of this research is analyzing how employees’ network positions are related to knowledge sharing. Considering the fact that it is a topic that is almost new and not so many qualitative researches has conducted, so the qualitative research method can explore new social aspects of the theory.

4.3 Research site and participants

This study is done in one of the branches of Sigma Kudos with 12 employees. Sigma Kudos is an international company which provides information solutions. And there are approximately 1300 employees all around the world, and departments in many countries, such as Sweden, China, Ukraine, Hungary and Finland. They work with information, its architecture and with the design and delivery of content. They develop software solutions for information management, and produce effective information, diagnostic and training materials using well defined processes, methods and tools (Sigma Kudos, 2011).

So, knowledge and information are viewed as the core competitive advantages in this company, and how to improve knowledge sharing process is quite important to study, according to the global operation manager. The department in China is chosen as the research site, because of fast developing knowledge and economics there.

Participants in this study were technical writer and team leader in the information area. They were chosen because they viewed knowledge, such as technical writing skills, as their competitive advantages, and knowledge
sharing becomes quite significant in their daily life. That is what the author really wants to investigate.

Firstly, because the author was studying in Sweden, it is easy for him to find two employees in Sweden to have a general interview about how people share knowledge within the company, through which, author could get a clear overview about it. After that, 10 more interviews were conducted in another department to help the author to have a better understanding about the formal or informal network in one department. A total of 32 employees worked there and there were 4 teams responsible for different technical writing tasks. Most of their work was to write technical document, technical report, guide manual of customers’ products, and so on. All those technical writing documents could be seen as knowledge and the writing experience and good writing template are need to be shared within and without teams to benefit the whole organization. This study was conducted with two of those teams with open-ended interview questions. The participants were 3 females and 9 females, of which 2 were Swedish who worked in department Växjö, Sigma Kudos. These two Swedish are interviewed before those 10 employees in China and they help me better understand what they do and how they do it to improve knowledge sharing process in information solution area. All participants’ age is from 23 to 42 years old and 8 of them are master degree in informatics and others are bachelor in informatics and English communications.

Here is the list of characteristics of the participants:

<table>
<thead>
<tr>
<th>No.</th>
<th>Age</th>
<th>Gender</th>
<th>Nationality</th>
<th>Network position</th>
<th>Educational background</th>
<th>Expertise in technical writing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>42</td>
<td>Male</td>
<td>Swedish</td>
<td>Global Operational Manager</td>
<td>Master in Informatics</td>
<td>Very good</td>
</tr>
<tr>
<td>2</td>
<td>39</td>
<td>Male</td>
<td>Swedish</td>
<td>Department Manager</td>
<td>Master in Mathematics and Informatics</td>
<td>Very good</td>
</tr>
<tr>
<td>3</td>
<td>37</td>
<td>Male</td>
<td>Chinese</td>
<td>Department Manager</td>
<td>Master in Information System</td>
<td>Very good</td>
</tr>
<tr>
<td>4</td>
<td>29</td>
<td>Male</td>
<td>Chinese</td>
<td>Team leader</td>
<td>Master in</td>
<td>Very Good</td>
</tr>
</tbody>
</table>
4.4 Data collection

The resources required in conducting researches can be categorized in two classes: Primary sources and Secondary sources. Primary sources are created by direct observation, conducting interview, checking logs, eyewitness accounts and participating in activities in the firm, etc., while, secondary sources are descriptions or summaries of another person’s work, like summaries of researches, literature review, discussion of models and theories, books, etc. (Rozakis, 2007; Gravetter and Forzano, 2008).

In this research, the researcher uses both primary and secondary sources to collect the required data for analyzing how employees’ network positions are related to knowledge sharing.

At the first place, in conducting the current research using secondary sources like books, articles, seminars, and models play an important role in selecting the models, theories and making questions that should be answered over the research for gathering raw data from employees.
For collecting data from primary resources in this research it is planned to use semi-structured, qualitative interviews with general and open-ended questions and observation (Creswell, 2009). The aim is to take focused conversation and interview with employees and managers who are involved in this research (Sampson, 1996). Moreover, it is a useful and rich way to obtain informants’ interpretations of events and actions, and their aspirations and views of participants (Walsham, 1995). Thus for this purpose, a qualitative data acquisition method fits well to this study. Moreover, studying the current system’s documents can be a supplementary source for researchers in gaining more prerequisite information for analyzing business and system requirements.

There were twelve employees to be interviewed in this research, and most of them are ordinary employees of different positions, because of which, they could know much about how their organization works and how they share knowledge and communicate with each other in working life. Another two managers were interviewed before those other ten employees. Each interview lasted approximately one and a half hour, following the principles of qualitative interviews (Creswell, 2009). The data collection is done in several stages:

At the first stage, two general and open-ended interviews have conducted with technical manager and Global Operation Manager for Information Management. These interviews contained general questions about the current status of employees’ network positions, briefly. As a result of analyzing the findings of the first stage we can achieve information about general situations. Moreover, we can make sure if they have commitment to conducting research in their company.

In the second stage, semi-structured interviews are conducted with those ten employees to gain detailed information about:

- With whom and how employees usually share knowledge within organizations? Through which, we can describe every employees knowledge sharing networks.
- The problems and barriers of sharing knowledge through current knowledge sharing networks.
• Their suggestions about improving organizational sharing knowledge.

The firm’s published literature and documents were also used as the data collection sources. Some information was obtained from the Internet and inner Software, like SmartShare Software, which is used by employees.

4.5 Data analysis process

In qualitative studies the data collection and analysis may occur concurrently. Yin (2003) notes that one important practice during the analysis phase of any case study is the return to the propositions (if used); there are several reasons for this. First, this practice leads to a focused analysis when the temptation is to analyze data that are outside the scope of the research questions. Second, exploring rival propositions is an attempt to provide an alternate explanation of a phenomenon. Third, by engaging in this iterative process the confidence in the findings is increased as the number of propositions and rival propositions are addressed and accepted or rejected.

This study is a qualitative, and hermeneutical and descriptive method was used for analyzing the data. Ratcliff (2008) articulated that looking for the meaning of the text that collected from the observations and interviews for people in special situations, tell the story, not the researchers, use their words in finding the report. I used this hermeneutical analysis method to conduct this work. First, I organized and prepared the data for analysis, including transcribing raw data from interviews and observation, published documents, sorting and arranging the data into different types depending on the source of information. After that, I read through all the data, get the main idea of them and categorizing them in different categories to find the patterns. Then, several different themes and subthemes are classified. Finally, the meaning of the themes and subthemes were interpreted, asking “What were the lessons learned?” captures the essence of this idea. (Lincoln and Guba, 1985; Creswell, 2009)

4.6 Validity and reliability
According to Creswell (2009), Quality validity means the researcher checks for the accuracy of the findings by employing certain procedures, while qualitative reliability indicates that researchers approaches is consist across different projects.

Some of the procedures I am going to use for providing validity over my studies are included: use member checking to determine the accuracy of the qualitative findings through talking the final report or specific description (polished product such as themes or the case analysis) back to participants and determining whether these participants feel that they are accurate. Interviews with participants are taken in the study to give them an opportunity to comment on the findings (Creswell, 2009).

Validate information resources are used for literature review and interview with experienced and specialized people in the company. Moreover, external auditor is used to review the entire project.

For providing reliability in this study some procedures are conducted, such as: checking transcripts to make sure that they don’t contain obvious mistakes made during transcription; in evaluating frameworks and exploiting modernization barriers from literature review I will use different data sources of information to build a coherent justification for the research findings.

### 4.7 Researcher’s role

As mentioned before, this qualitative study is conducted using observations and depth interviews with participants. As a researcher, I mostly interpreted and analyzed the raw data from interviews, observations and transcript them into different categories. Creswell (2009) argued that being able to participate as an observer helped the researcher to obtain a deep understanding about the investigation.

### 4.8 Ethical issues

Since data collected from the specific organization is considered sensitive, so all the research interviews were anonymous observation record and the
documents which organization offers for us were kept confidential (Creswell, 2009).

The tape recorder is used when interviewing their employees and informs them beforehand to avoid any ethical issues. And if they do not think they feel good when tape recording, then I would respect their choice.

The summarization of the interview is shown to the participants, therefore they were ensured that what I compiled was what they were stating. And after I analyzed what I believed from the observation, I showed back to them to make sure they agreed with what I have written in my paper about their behaviors (Creswell, 2009).

The participants were given by brief information about the research purpose and what the participation meant to them. I offered the benefits for the organization to make them feel worthy of participating.

All the participants were informed that whenever they would like to cancel the interview, they could do it. And I would remove all the material related to them (Creswell, 2009).
5 Results and Discussion

The empirical findings are discussed here based on the interviews. The interview questions are based on the knowledge sharing and structural holes theories, and the previous discussion with the two managers is to make sure all questions (Appendix 1) are general and easy to understand for the other participants. The researcher found that not only formal network structure exists within the company, but the informal network structure is also an important aspect with respect to knowledge sharing.

Based on the structural holes theory, the actor in the hub of the network could get more opportunities and connections over others, and the hub is surrounded by structural holes (Burt, 1992). This could be testified with the empirical finding of informal network structure, and the employee who is located in the hub of the network could get more opportunities and chances to get knowledge and share with others easily. However, sometime there may be disadvantages for the hub employees that more pressure and burden make them tired and reluctant to share.

5.1 Formal and informal networks of organization

The following two network structure could be seen as another empirical finding based on the observation of the researcher, and they illustrate the main structure of the company and how participants communicate and share knowledge with each other. According to the structure holes theory, more analysis will be discussed in the next chapter.

Social network and structural holes analysis allow managers in the organization understand the social relationships among employees and managers that can either facilitate or baffle knowledge sharing. Based on the interview and observation in the case of a Swedish company, many technical writing groups were interested in assessing their ability and good technical writing experience to create and share knowledge as a group. As a result, I observed their working environment and interviewed two of the groups of technical writing. As can be seen in Figure 6 and Figure 7, a social network diagram, which is a map of individuals and social ties that link them together.
within an organization. And it illustrates how knowledge and information flow, to whom do individuals turn for help, and how sub-groups share what they know as efficiently and effectively as they could. For instance, in this company, I observed how employees ask for help and information from others by drawing a picture with pot representing individuals, and lines representing relationships and ties between them. These two figures revealed a striking contrast between the group’s informal and formal structure. Figure 6 illustrates the formal structure of the organization, H stands for Head manager of this group, and M stands for mid-level manager, O stands for Ordinary employees.

Figure 6. Formal structure of information solution organization

Figure 8 shows the informal structure of the organization, and O2 is the hub of this structure, which has distinguished advantages compared to others.
Figure 7. Informal structure of information solution organization

The researcher realized that the informal network structure plays an important role in the knowledge sharing process. People are willing to share with their good friends, compared to others with formal network relations. So the researcher chooses the informal network structure to investigate how employees’ different network position could influence knowledge sharing within organization.

5.2 Network structure and Social exchange theory

According to social exchange theory, the potential costs and benefits are weighed before exchanging, and indeed, assuming that individuals are willing to just contribute their knowledge is a mistake (Davenport and Prusac, 1998). In this study, individuals prefer to share their knowledge with their managers, because they believe they could get more benefit from employees in higher position, including salary reward, promotion, etc.

“I would like to share my experience and skills with my boss, because he always know more
Not only the individual in the hub position of social networks but also individuals in other positions prefer to share knowledge because of potential benefits, according to the interviews. Coleman (1990) argued that self-interest is the key factor that drives many people’s actions, which could be proved by this study. Most of the participants would like to share experience with others when they remind others shared with them once, and relationship is build up through continuous sharing process. So the social exchange activities may improve the whole knowledge sharing behaviors within organizations by build more network connections.

Based on social exchange theories, the rewards are incentives and very important to source player, which can be social rewards, materialistic goods. It is true that more rewards will encourage individuals to share knowledge.

“If more bonus, I will share my experience with anyone in any place. The bonus system of knowledge sharing needs to be built up to encourage us.”

Other rewards like sense of goodness and self-satisfaction are short of support in this study, which needs to be concerned more.

5.3 Network structure and Social capital theory

Nahapiet and Goshal (1998) argued that social capital comprise of both one’s social network and the resources which can be obtained from the social network. And the individual who is located in the hub position has more social capital than the ones in other positions. In this study, the hub position of employee O2 had more resources and access to information and knowledge, which is his unique competitive advantage.

Portes (1998) recognized that important features of social capital, such as trust and reciprocity are developed in an iterative process. In this study, it is true that participants are more likely to share experience with others who
trust with each other and benefit from each other. Relationship could also be built up through trust knowledge sharing.

“We share with each other because we trust each other, and sharing could benefit both of us.”

5.4 Network structure and structural holes theory

Based on the structural holes theory and interview of employees in different positions within the company, there is a great need for improving the knowledge sharing process, and also the researcher described the main network structure of the company, which is established according to observation and interviews. (Burt, 1992, 2004).

Different employees of organization have different expectation and demands, the organization will accomplish nothing, if everyone ignores the common objective of their organization and only pay the whole attention to their own demands, based on the top managers’ saying.

“Employees should realize the common benefit of the whole organization, not only their own.”

Every member of the organization, not only managers, but ordinary employees should realize the common aim is the premise of members gaining benefit. Enough communication is needed and cooperative relationship is quite important in realizing the common aim of the organization. According to the answers from the interview and researcher’s observation, especially the informal network structure, the researcher divided all the employees in the company into two groups, which are ordinary members and managers. Ordinary members are placed in the lower level of the organization network, while managers are placed in higher level. Base on structural holes theory and this two-level of network structure, further analysis will be conducted in this paper.
The basic network structure of the organization based on structural holes theory is described in the figure below, and it is an example of one team: M1, M2, H stands for the managers, O1, O2, O3, O4 stand for Ordinary Employees.

Figure 8. Structural holes in two-level network structure of organization

In Figure 8, O stands for ordinary employees, and M stands for managers. For example, in the above level of managers, M1 connects with M2 and H directly and there is a structural hole between M2 and H. At the level of ordinary employees, O2 directly connects with O1, O3 and O4; therefore there are three structural holes: O1O3, O3O4 and O1O4. There are many structural holes between the levels of managers and the level of ordinary employees.

The results can be seen from the Figure 8 that the employees who located in the positions of M1 and O2 are in the favorable position, because they possess more structural holes than other employees. The network structure of organization in Figure 8 is perfect to M1 and O2, but it is imperfect to the whole organization, so more connection should be built up based on structural holes theory to make the whole organization work effectively and efficiently.
Figure 9. The perfect closed two-level network structure of organization

Anyone who wants to get more structural holes must contact with unrelated individual and organization, so as to gain more advantages in control and information. At the level of ordinary employees of Figure 8, employee O2 locates in the hub of the network and possesses structural holes, therefore employee O1, O3 and O4 can’t contact with each other without employee O2. And employee O2 can gain more advantages by building bridges over other employees. Several interviewees said that:

“I would gain more useful knowledge if everyone is open to share their valuable experience, but always I just share with someone who has a good relationship with me”

Based on structural holes theory and interview answers, It may be true that anyone who wants to gain more structural holes should contact with unrelated individuals, in order to gain more distinguish advantages in information and control.
Another saying is that:

“I know most of the employees in my organization, and people are willing to ask me questions and share their knowledge with me, through which we build up a good relationship with each other.”

That means he has good social network relationships and he becomes important and gain distinguish advantage in the organization. Without him, knowledge sharing becomes baffling. However, the knowledge sharing process would be upgraded if more connections or bridges are formed between unrelated employees within the organization. This can be described at the level of ordinary employees in Figure 9. And employee O2 will gain nothing by bridging, because each player contacts with others directly and there are no structural holes in the network of Figure 9. It can be seen that the structure of the network is changed and the value of the network is upgraded through the formation of new connections.

Although the closed network structure in Figure 9 is not good to Employee O2, but it is good to the whole organization, because a closed network structure ensures the unobstructed communication and reduces the cost of bridging inside the organization. And everyone should realize the common aim of the organization is to let all the members gaining benefit based on structural holes theory, So Figure 8 shows an imperfect network and the perfect two-level network structure can be seen in Figure 9.

5.5 Senior managers become peripheral

Based on the observation, one of the findings is that as people move higher within organizations, and their work starts to entail more managerial and administrative tasks, which makes them both less accessible and knowledgeable about their subordinates’ daily work. In Figure 9, M2 is removed from the day-to-day operations of this group and it revealed also that the most-senior person H was one of the most peripheral in the informal network.

5.6 Fear of losing power makes knowledge sharing baffling
One major obstacle of knowledge sharing is that knowledge can be considered a source of superiority and power (Gupta and Govindarajan, 2000). Thus employees' unique knowledge usually results in positive evaluations from human resources manager, such as salary bonuses, promotion, etc. people are reluctant to share knowledge because it becomes a common good and they may lose their distinctive advantages compared to other employees. In other words, to ask for information and knowledge is to give power to someone. However, according to the results from the interviewees, employees are more likely to share knowledge with someone with higher status and position in the network structure as their supervisor or boss compared to a coworker.

“Fear of losing competitive knowledge and power is a kind of barrier when I share knowledge with others within the organization. And I am more likely to share knowledge within the group, rather than without the group.”

Based on the interview answers, the extent to which employees share their knowledge depends on the property of the group. And if the group is more cooperative, people are more willing to share; otherwise within competitive group people are more worried to losing power.

“I am concerned about losing power when I use an electronic knowledge management system, because my own work can be viewed by all users”

Employees are worried about losing their competitive knowledge when they upload their work to an electronic knowledge management system, which means the safety of knowledge need to be considered when building up an electronic knowledge management system.

5.7 The hub is double-edged sword to the employee in that position
In this case, O2 plays in terms of both overall knowledge and information flow within an organization and being the only point of contact between members of the M1 group and the rest of the network. Based on his words and the structural holes theory, that means the role of O2 is significant to the whole organization, and his reputation for expertise and responsiveness had resulted in his becoming a critical source for all sorts of knowledge and information. Almost all employees are willing to ask him questions and share valuable experience with him. The situation is good for O2, but it is not good for the whole organization. However, on the other hand, the informational requests O2 received and the number of projects in which he was involved grew excessively, which may cause him stress.

“I try to be friendly to anyone within the organization, and help them as possible as I can. However, sometimes I feel tired since I am involved in so many issues.”

Knowledge sharing process in the whole organization becomes baffling, because O2 had become a bottleneck. So the hub position is double-edged sword to the employee in that position.
6 Conclusion

Knowledge sharing is so important in nowadays organization, and it may be improved based on different theories. Studies of employee social network positions have revealed potential competitive advantages for individuals and organizations. In this study, we interviewed 12 employees in a Swedish company and observed their working activities, especially knowledge sharing activities. Then we examined the relationship between different employees, and answered the research question and explained how employees’ network positions are related to knowledge sharing and how it influences this process from the perspective of structural holes theory. We found that the more employees bridging structural holes the more likely knowledge may be shared, and the less structural holes in the organization, the better for the whole organization. However the hub position in knowledge network may burden too much, and may need to be released from the pressure. The major finding enriches our understanding of the influence of employees’ informal/social and formal network on knowledge sharing within organization. However, social networks are quite different from formal network with respect to knowledge sharing. Employees prefer to share with good friends and trust issue has to be taken into consideration. Fear of losing power and advantages when using technical tools is another finding.

6.1 Implication and suggestion

Structural holes means the opportunity of distinctive advantage and resource to the employee in the hub position, but it is not good to the whole organization. All members within the organization should realize the common aim of the organization is to let all employees gain benefit, so the less structural holes in the organization, the better to the whole organization. And the more employees bridging structural holes the more likely knowledge may be shared within the organization based on structural theory.

There exist informal and formal network structures in the organization and it is quite different based on the analysis. Regardless of the formal structure, people share their knowledge mainly based on the informal network structure and personal relationships with each other. So manager should pay more
attention on the informal structure within the organization to make the knowledge sharing process becomes more effective and efficient.

Senior managers become peripheral because they move higher and their work begins to entail more managerial and administrative tasks, which makes them both less accessible and knowledgeable about their subordinates’ daily work. Therefore, managers should spend more time on their sub-employees, in order to share their expertise and experience, and help them improve their knowledge sharing process, for example regular workshop or community of practice.

The power aspect has to be considered during the knowledge sharing process. People are more likely to share knowledge without losing their competitive abilities and distinctive advantages, since they view knowledge as a power to themselves. So managers may build up an incentive system or reward system to encourage knowledge sharing. Besides, those who build bridges over other employees should also be compensated properly. The compensation may be little and nonmaterial, but it is a kind of approval for the bridging.

The organization should also encourage employees to establish contacts with others, especially the contacts between managers and ordinary members. It is necessary that managers should be positive and active to make connections with ordinary employees, because sometimes ordinary employees often feel embarrassed to make contact with managers.

### 6.2 Contribution

This research explains and gives more insights about structural holes theory with a new case of a Swedish company, which could contribute to the structural holes theory itself and give the employees in the organizations new understanding about how their network positions could influence their knowledge sharing process and how the organization could better leverage individual in these critical positions.

Based on the empirical findings, informal and formal network structure are quite different in knowledge sharing procedure, and employees are more willing to share with others who have built up a good relationship. This finding could be used as a contribution of other researchers who want to give
more insights about how informal network structure influence sharing process.

Based on structural holes theory, one of the findings “The hub is double-edged sword to the employee in that position” shows that the main idea “more employees bridging structural holes the more likely knowledge may be shared within the organization. And the actor who is located in the hub of the network structure possesses structural holes, thus can gain resources and advantages by building bridges over other actors” may not work in some cases.

6.3 Future research

Future research may continue to focus on “what are the difference between informal network structure and formal network structure with respect to the knowledge sharing process”, this topic could help people get a clearer picture of how they share knowledge in different networks and what the pros and cons of each of the networks are.

With the development of new social networks, another topic may focus on how to build up a social network structure through new technology-based platform, in order to encourage employees to share more knowledge without considering their network positions.
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Rozakis, L., 2007. *Schaum's quick guide to writing great research papers*


Appendix 1- Interview questions

Note:
Some interview questions may be sensitive to some employees, and we promise that your names will be anonymous in the final results, and your answers will also be in secret and will not be shown to anyone except us researchers. We really appreciate your cooperation.

<table>
<thead>
<tr>
<th>Name:</th>
<th>Gender:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age:</td>
<td>Nationality:</td>
</tr>
<tr>
<td>Education Background:</td>
<td>Network position:</td>
</tr>
<tr>
<td>Expertise in technical writing:</td>
<td></td>
</tr>
</tbody>
</table>

1. What is knowledge? How do you think it is important?

2. What kind of knowledge and experience do you usually share? And how?

3. With whom do you usually share knowledge?

4. What are the incentives to encourage you to share knowledge and what are the barriers for you to share knowledge within organization?

5. How many people in your organization and how do they organized?

6. How do you describe your organization’s formal network structure and informal social network structure?

7. How do you think organization’s network structure influence knowledge sharing within organization?

8. What technologies or tools do you usually use to share knowledge and how do you use?

9. What is your suggestion for improving knowledge sharing process in your organization?
Appendix 2 - Empirical findings of interview

There are nine tables in this appendix totally based on the nine interview questions. H1 represents the high department manager, M1 and M2 represent the two team leaders, and O1-O7 represents the ordinary employees in this organization. The reason why the author used the number M1, M2 and O1-O7 is to make it clear for readers to understand and at the same time easy for the author to draw the figure of informal and formal networks after the interview. The overall view summarizes the answers of all participants, and the comments are from the answers of employees and observations of the author.

Table 2. Summary of interview question 1

<table>
<thead>
<tr>
<th>Question 1</th>
<th>What is knowledge? How do you think it is important?</th>
</tr>
</thead>
</table>
| **H1**     | 1. Years of experience of management  
             2. Technical writing skill and experience  
             3. Analytical skills and decision making ability.  
             Importance: Knowledge could get from years of working experience, which make him special and important in a particular position in the company. |
| **M1**     | 1. Requirement gathered from customers  
             2. Technical writing documentation  
             3. Instruction, manual guide for customers  
             4. Information solutions.  
             Importance:  
             1. Asset of the company  
             2. Security issues |
| **M2**     | 1. Manual guide  
             2. Technical writing skills  
             3. Technical document, such as report  
             4. Instruction telling customers how to use a particular technology  
             5. The ability to make a decision |
| **O1**     | 1. Data, information, good experience  
             2. Technical writing document  
             3. Wealth and they all benefit from it. |
| **O2**     | 1. Facts, information, skills |
2. Technical writing skills.
3. Ability to survive and earn.

O3  1. Skilled required through education and experience.

O4  1. Useful information obtained every day

O5  1. Learning from the books and websites, sometimes, others.
    2. Quite important in information system area.

O6  1. Useful information,
    2. Experience and skills.
    3. Knowledge is money

O7  1. Learned in school and company.
    2. Reading books.
    3. With knowledge, you become outstanding.

Overall View
1. Technical writing experience and skills
2. Technical writing document, such as report, manual guide,
3. Product instructions

Comments
Since the Swedish company is an information solution company, and its main customers are the telecom electronics producer. Technical documents are the main service that provided by this company. They all see knowledge is very important.

Table 3. Summary of interview question 2

<table>
<thead>
<tr>
<th>Question 2</th>
<th>What kind of knowledge and experience do you usually share? And how?</th>
</tr>
</thead>
</table>
| H1         | 1. Good technical writing experience
            2. New ideas improving the effectiveness and efficiency of technical writing. |
|            | How to share:                                                      |
|            | 1. Within workshop discussion                                       |
|            | 2. Meetings with employees.                                         |
| M1         | 1. Customers’ requirements                                          |
|            | 2. Understanding of customers’ products, report                     |
|            | 3. Good experience of writing.                                      |
|            | How to share:                                                      |
|            | 1. Content Management System, called “Smartshare”                   |
|            | 2. Group meeting                                                   |
|            | 3. “DocFactory”                                                    |
| M2   | 1. Shared document, such as report, technical writing templates.  
      | How to share:  
      | 1. Smartshare”  
      | 2. Group meeting,  
      | 3. Workshop,  
      | 4. Presentation |
|------|---------------------------------------------------------------|
      | 2. Meeting and workshop |
| O2   | 1. Product manual guides,  
      | 2. Good templates of them  
      | 3. “Smartshare”  
      | 4. Group meeting. |
| O3   | 1. Technical writing report, etc.  
      | 2. Meeting, email. |
| O4   | 1. Group meeting  
      | 2. Shared understanding about customers’ product, such as telecom electronics. |
| O5   | 1. Presentation  
      | 2. Group meeting |
| O6   | 1. Good technical writing template, within “Smartshare”  
      | 2. Emails |
| O7   | 1. Document, reports, through “Smartshare” |
| Overall View | 1. Technical writing documents.  
      | 2. Content Management System, such as “Smartshare”,  
      | “DocFactory”  
      | 3. Group meeting |
| Comments | The company uses their own inner Content Management System to share different kinds of technical document. Other tacit knowledge is likely share within group meeting and other daily activities. Meeting is the main method to communicate with each other within the formal network structure, while, the use of “Smartshare” could reflect how their social network they have built up. |

**Table 4. Summary of interview question 3**
<table>
<thead>
<tr>
<th>Question 3</th>
<th>With whom do you usually share knowledge?</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>1. Only group leaders, M1 and O2.</td>
</tr>
<tr>
<td>M1</td>
<td>1. Some of group members and his boss. H1, O2</td>
</tr>
</tbody>
</table>
| M2         | 1. If customers requirement, only shared within group considering the security problem.  
2. One guy in his group, who is curious and hardworking.  
3. O4 |
| O1         | 1. Ask questions and share with boss  
2. Share within his team, O2, O3 |
| O2         | 1. Popular employee with many connections  
2. People are willing to ask him questions and share with him  
3. Build up a good relationship with each other.  
4. H1, M1, O3, O4, O5, O6 |
| O3         | 1. Expecting employees to be open to share  
2. Always share with someone who has a good relationship with him  
3. Share with team members, O1, O2 |
| O4         | 1. Share with team member, O5, O7  
2. O2  
3. Cannot find his manager sometimes, M2. |
| O5         | 1. Hard to find the manager  
2. Usually share with O4, O7 and O2.” |
| O6         | 1. Team members.  
2. O2, O4 |
| O7         | 1. Share with team members, O4  
2. No connection with other teams, except O2 |
| Overall View | 1. Some people around them.  
2. Some people who are curious and hardworking. |
| Comments   | From their answering, they usually share knowledge through formal company meeting with their boss and subordinates. Busy with other management work makes them lack of time. Most of them share knowledge within their teams, good relationships; some are like to share with their boss. O2 is an easy-going man with sense of humor, and he is also the oldest employee working there for many years. |

**Table 5.** Summary of interview question 4
<table>
<thead>
<tr>
<th>Question 4</th>
<th>What are the incentives to encourage you to share knowledge and what are the barriers for you to share knowledge within the organization?</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>1. Reward system to encourage people who are willing to share their knowledge and experience, for example, extra bonus and position promotion. This could be viewed as encouragement and also barriers.</td>
</tr>
<tr>
<td>M1</td>
<td>1. Learn from each other and improve our social relationship through knowledge sharing 2. Lose his position if he tells all what he knows to anyone within or without the group.</td>
</tr>
<tr>
<td>M2</td>
<td>1. Related to salary 2. Feel good when he teaches other employees and they would respect him and see him as a professional.</td>
</tr>
<tr>
<td>O1</td>
<td>1. Reward system to encourage knowledge sharing, 2. Reluctant to share and want to finish the work as soon as possible.</td>
</tr>
<tr>
<td>O2</td>
<td>1. Expecting bonus 2. Security problems as a barrier.</td>
</tr>
<tr>
<td>O3</td>
<td>1. Friendly and help others 2. Feel tired</td>
</tr>
<tr>
<td>O4</td>
<td>1. Losing power when uses an electronic knowledge management system</td>
</tr>
<tr>
<td>O5</td>
<td>1. Reward system 2. Share with my friend with trust</td>
</tr>
<tr>
<td>O6</td>
<td>1. New here, and wants to share with anyone 2. No experience and afraid of making mistakes.</td>
</tr>
<tr>
<td>O7</td>
<td>1. Do not share with guys outside the group</td>
</tr>
<tr>
<td>Overall View</td>
<td>Fear of lose of competitive advantages and power, reward system, gaining more respect, improve relationship, etc. could be the main incentives and barriers.</td>
</tr>
<tr>
<td>Comments</td>
<td>Based on their answers, in most cases they are willing to share. However sometimes, they are worried about losing their power and professional knowledge and they want to gain reward through sharing. The most interesting answer from O2 that he told me he is friendly to everyone and are willing to help everyone, but sometimes he feels really tired. Others mostly like to ask him questions and he is always nice to everyone.</td>
</tr>
</tbody>
</table>
Table 6. Summary of interview question 5

<table>
<thead>
<tr>
<th>Question 5</th>
<th>How many people in your organization and how do they organize?</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>1. Technical writers, 2. 4 teams 32 employees now in total</td>
</tr>
<tr>
<td></td>
<td>3. Sent to customers’ place and help them as information</td>
</tr>
<tr>
<td></td>
<td>consultants to give them technical document solutions.”</td>
</tr>
<tr>
<td>M1</td>
<td>1. 5 employees in my team, including him and a new intern.</td>
</tr>
<tr>
<td>M2</td>
<td>1. 4 employees. All of them are technical writers.</td>
</tr>
<tr>
<td>O1</td>
<td>5 employees in one team</td>
</tr>
<tr>
<td>O2</td>
<td>5 employees, including one manager</td>
</tr>
<tr>
<td>O3</td>
<td>5 employees</td>
</tr>
<tr>
<td>O4</td>
<td>4 employees, one manager and one intern</td>
</tr>
<tr>
<td>O5</td>
<td>4 employees</td>
</tr>
<tr>
<td>O6</td>
<td>5 employees</td>
</tr>
<tr>
<td>O7</td>
<td>4 employees</td>
</tr>
<tr>
<td>Overall View</td>
<td>The formal network structure should be one boss and four</td>
</tr>
<tr>
<td></td>
<td>groups; each of the group includes 3 or 4 employees.</td>
</tr>
<tr>
<td>Comments</td>
<td>This interview is only conducted within two of four groups.</td>
</tr>
</tbody>
</table>

Table 7. Summary of interview question 6

<table>
<thead>
<tr>
<th>Question 6</th>
<th>How do you describe your organization’s formal network structure and informal social network structure?</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>1. Formal network structure: One department manager, four teams, four team managers, and thirty-two employees in total.</td>
</tr>
<tr>
<td></td>
<td>2. Informal network structure: One function of the Content Management System within the organization - “Smartshare” is like a social network.</td>
</tr>
<tr>
<td></td>
<td>3. Forum and discussion board for users to share knowledge and discuss problems.</td>
</tr>
<tr>
<td>M1</td>
<td>1. Informal network structure: coffee break.</td>
</tr>
<tr>
<td></td>
<td>2. Lunch time, sit together and share experience sometimes.</td>
</tr>
<tr>
<td>M2</td>
<td>1. Facebook</td>
</tr>
<tr>
<td>O1</td>
<td>No idea.</td>
</tr>
</tbody>
</table>
| O2   | 1. Coffee break talking,  
|      | 2. Lunch time talking     |
| O3   | 1. Facebook               
|      | 2. LinkedIn               
|      | 3. Lunch talking.         |
| O4   | 1. “Smartshare”           |
| O5   | 1. Workshop               
|      | 2. Coffee break.          |
| O6   | 1. Facebook               
|      | 2. LinkedIn               |
| O7   | No idea.                  |
| Overall View | Coffee break, lunch time, “Smartshare” |
| Comments | Some of them were confused about the informal network structure when interviewing, I explained that it is like a social network. |

**Table 8. Summary of interview question 7**

<table>
<thead>
<tr>
<th>Question 7</th>
<th>How do you think organization’s network structure influence knowledge sharing within organization?</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>1. Within team: easier for cooperative team makes knowledge</td>
</tr>
<tr>
<td></td>
<td>2. Common benefit could be maximized only through cooperating and sharing.</td>
</tr>
<tr>
<td></td>
<td>3. Spend more time on management and other communicating work with other companies</td>
</tr>
<tr>
<td>M1</td>
<td>1. Within his own team rather than other members in other teams</td>
</tr>
<tr>
<td>M2</td>
<td>1. Share with my team members.</td>
</tr>
<tr>
<td>O1</td>
<td>1. He’d like to share with friends who have good relationships, since potential benefit</td>
</tr>
<tr>
<td>O2</td>
<td>1. Everyone in the company knows him</td>
</tr>
<tr>
<td></td>
<td>2. They are all glad to share something with him.</td>
</tr>
<tr>
<td>O3</td>
<td>1. More often within the team.</td>
</tr>
<tr>
<td>O4</td>
<td>1. More often within the team</td>
</tr>
<tr>
<td>O5</td>
<td>1. No big influence.</td>
</tr>
<tr>
<td>O6</td>
<td>1. More often within the team</td>
</tr>
<tr>
<td>O7</td>
<td>1. Share within the team</td>
</tr>
<tr>
<td>Overall View</td>
<td>Within the team, knowledge sharing may be easier. Good friend.</td>
</tr>
</tbody>
</table>
Cooperative teams are more willing to share to benefit all members. While employees in different teams are reluctant to share knowledge.

Table 9. Summary of interview question 8

<table>
<thead>
<tr>
<th>Question 8</th>
<th>What technologies or tools do you usually use to share knowledge and how do you use?</th>
</tr>
</thead>
</table>
| H1         | 1. “Smartshare”  
2. Meeting. |
| M1         | 1. “Smartshare”  
2. Group meetings |
| M2         | 1. “Smartshare” |
| O1         | 1 Facebook,  
2 meetings, everyday |
| O2         | 1. “Smartshare”, it is good software, which including lots of functions. |
| O3         | 1. Emails, group meetings |
| O4         | 1. Group meetings |
| O5         | 1. Group meetings |
| O6         | 1. “Smartshare” |
| O7         | 1. “Smartshare” |
| Overall View | 1.“Smartshare”,  
2.different kinds of meetings |

Comments: Based on their answers, content management system could be viewed as the main technical tools to share technical document, and they also share through different meetings.

Table 10. Summary of interview question 9

<table>
<thead>
<tr>
<th>Question 9</th>
<th>What is your suggestion for improving the knowledge sharing process in your organization?</th>
</tr>
</thead>
</table>
| H1         | 1. Employees should realize the common benefit of the whole organization, not only their own.  
2. Managers may lead the sharing process.  
3. Responsibility for managers to keep the working environment more dynamic and easy to share. |
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
| **M1** | 1. Share with someone who knows nothing could be beneficial to others.  
2. More regulation and measures should be taken to improve knowledge sharing activities |
| **M2** | 1. Share within the team is beneficial to everyone within the team.  
2. Regular sharing mechanism should be built up, like knowledge sharing meeting once a week. |
| **O1** | 1. Hope more reward of knowledge  
2. Protection of copyright |
| **O2** | 1. More connections make him outstanding  
2. Big burden. |
| **O3** | 1. Afraid of asking managers. |
| **O4** | 1. Connection between employee and managers are important  
2. Connections between employees in different teams. |
| **O5** | 1. Need more help from his boss  
2. Expecting to build up a mechanism that everyone would be involved in sharing knowledge |
| **O6** | 1. More connections between employee and managers should be built. |
| **O7** | 1. Boundary between employees and managers |
| **Overall View** | 1. More connection between teams and different kind of employees  
2. Big burden for the key employee  
3. Need more help from managers  
4. Afraid of losing power when sharing |
| **Comments** | No. |