Acquiring And Sharing Knowledge In SMEs: A Case In The Manufacturing Industry

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ABSTRACT:

Successful knowledge acquiring and sharing plays an important role in the everyday work of any company; these processes are crucial even for companies in manufacturing networks. The aim of this research is to study knowledge acquiring and sharing practices in small and medium sized companies in the manufacturing industry - and especially the information technology (IT) related to these practices. This case study was conducted by interviewing six companies in Western Finland. The findings show that various tools are used in companies for acquiring and sharing knowledge across the organizational borders. However, the assisting role of IT in the process is vague: IT is used and companies believe that it can help the process, but there are various problems and doubts related to it.

Keywords: *Knowledge management processes, Acquiring knowledge, Knowledge sharing, Manufacturing networks*

1. Introduction

It is widely acknowledged today that knowledge is one of the most important resources to organizations. To many companies, knowledge is in fact a product that is sold to customers in one form or in another. This is particularly the case when it comes to consultancy. But also traditional production companies see that having the right knowledge in the right place, at the right time, can be the key to success. In networked business operations like supply chains or supply networks the value of knowledge is held even higher. This because having the right knowledge is a prerequisite for fast and high-quality operations (Desouz et al., 2003: 132). At the same time knowledge management is more complicated in these cases because knowledge has to be developed, shared and utilized across organizational borders.

This paper concentrates on the practices of acquiring and sharing knowledge in small and medium sized companies (SMEs), operating in manufacturing networks. According to Wang and Noe (2010: 115) knowledge sharing has a positive impact on an organization's performance in several different ways: it can (for instance) help to reduce costs, enhance team performances, and improve the innovation capabilities of an organization. A study by Law and Ngai (2008) supports this view. To Liu and Liu (2008) knowledge acquisition and sharing means the start of the organization's overall

knowledge management process. Information systems can be seen as suitable tools for fostering knowledge and information sharing (Earp et al., 2013: 445).

The content of the paper is as follows. At first the concepts of knowledge, knowledge management and knowledge acquiring and sharing are explored from the theoretical point of view. After this the focus shifts to the knowledge acquiring and sharing practices of the case companies. Answers will be provided to the following questions: which channels are used in the companies for acquiring knowledge? Special focus is placed on acquiring knowledge from outside the organizational borders. The network plays a central role in knowledge sharing: how is knowledge shared between customers and suppliers? In addition, the role of information systems in knowledge sharing within the network will be explored. At the end of the paper, the empirical findings are discussed in connection to theories and some conclusions are made.

2.   Theoretical Concepts
2.1.   Knowledge

Knowledge can be defined in various different ways. One of the most quoted definitions of knowledge is by Nonaka (1994: 15): *knowledge is justified true belief*. This definition is based on the tenets of Western philosophy. Berger and Luckmann (1966) on the other hand see knowledge as a set of shared beliefs that are constructed through social interactions and are embedded within the social contexts in which knowledge is created. This definition emphasizes the social dimension of knowledge: knowledge is created by people interacting and it always has a context.

Data, information and knowledge are often separated conceptually when defining knowledge. Davenport and Prusak (1998: 5) define data as *"a set of discrete, objective facts about* events" and information as a message with a sender and a receiver that is meant to have an impact on the judgment and behavior of the receiver. Finally, they define knowledge as "*a fluid mix of frame experiences, values, contextual information and expert insight that provides a framework for evaluating and incorporating new experiences and information*". According to Bhatt (2001: 69) knowledge is meaningful information. In other words, knowledge is derived from information. The difference between data and information lies in the level of organization; the difference between information and knowledge lies in the level of interpretation. Hicks et al.(2006: 21) see that it is important to define these three concepts before the accurate discussion of knowledge management is possible.

Yet another interesting view to defining knowledge is connecting it to understanding. Chakravarthy et al. (2003: 306) state that knowledge is defined by most authors "*as a type or degree of understanding that exists at a point of time*". Chong and Pandya (2003) define knowledge as understanding that one gains through experience, reasoning, intuition, and learning. We expand our knowledge when others share their knowledge with us. New knowledge is born when we combine our knowledge with the knowledge of the others.

Another important aspect on knowledge is the division of knowledge into *explicit* and *tacit knowledge* made widely known by Nonaka and Takeuchi (1995). The authors argue that explicit knowledge is objective, whereas tacit knowledge is subjective.

Explicit knowledge is knowledge based on rationality and mind; it is sequential. Tacit knowledge is knowledge based on experience; it is simultaneous and hard to be removed from the context of time and the place. The authors relate tacit knowledge more to practice and explicit knowledge more to theory. Tacit knowledge is hard to express in words and even more difficult to express in written form. It is a part of human values, attitudes, motivation etc. It is mostly created through experience and practice. This all means that tacit knowledge is difficult to share. Explicit knowledge, on the other hand, is closer to the concept of information. It can easily be embodied in language or some other code system. Therefore it is also easier to transfer explicit knowledge than tacit knowledge. (Nonaka and Takeuchi 1995.)

Perhaps all these different definitions reveal something about the nature of knowledge: it is not easy to define it unambiguously. Maybe we should not even try, and instead see these different views as the characteristics of knowledge. If we wish to study knowledge in networks, we will have richer results when considering several different aspects of knowledge instead of using just one.

2.2.   Knowledge Management

Knowledge management can also be defined in many different ways. One way of doing it is using knowledge management processes. Liebowitz (2005: 1) sees knowledge management as a value creation process: "*knowledge management is the process of creating value from an organization's intangible assets*". According to him, knowledge management includes sharing and leveraging knowledge both internally and externally. According to Turner (2005: x) knowledge management in traditional organizations consists of three steps: variation, selection, and retention. New ideas are created within the function, the best of these ideas are utilized and finally the knowledge is stored in a function where it can easily be reused.
Chakravarthy et al. (2003: 306-316) states that knowledge management has to include three processes in order for an organization to gain a competitive advantage. These processes are defined as the accumulation, protection and leveraging of knowledge. They suggest that "*knowledge is accumulated when units within the firm or the organization as a whole gain new knowledge*". The knowledge must be protected so that competitors do not acquire the company's competitive advantage. The tacitness, complexity and specificity of an organization's knowledge base helps the organization to defend its competitive advantage. To leveraging existing knowledge is to use it for commercial purposes.

According to Love et al. (2005: xiv) knowledge management is the process for acquiring, refining, storing, and sharing knowledge within an organization. Marshall et al. (1997: 230) say that there are at least seven functions knowledge can have in an organization. New knowledge can be created within the organization. Knowledge can be accessed or transferred either formally or informally. It can be "represented" enabling easier access or it can be embedded in processes. It can be utilized. And finally, these different knowledge processes can be facilitated by the development of a culture that values, shares, and uses knowledge.

Different authors sometimes use different labels when defining knowledge management processes but we can easily see that there are some similarities. First there has to be some knowledge: it can either be acquired (in various ways) or be created (new knowledge). This knowledge can then be shared with others in various different ways - like using e-mails, databases, training, mentoring, etc. Naturally, knowledge has to be used for some purpose if it is to create some benefit for the organization. Sometimes it is used only once and sometimes it will be stored to be used again later. Chakravarthy et al. (2003) also raise a point about the processes of storing and protecting knowledge that might be important to consider when we are dealing with knowledge in networks: what knowledge should be shared and what should be protected?

Acquiring knowledge

According to Nieminen (2007) the process of knowledge acquisition consists of the five phases shown in Figure 1. The identification phase is the first step, when new knowledge is recognized. In the transmission phase, knowledge is transferred from one company to another. The processing phase is strongly dependent on the person(s) involved. Understanding the context and the competencies through which knowledge is acquired is important. Evaluation of the usability of knowledge in the new context is significant in this phase. Storage of knowledge must be done wisely, by using appropriate storage methods and by disseminating it to relevant units. This is to enable the successful retrieval and utilization of knowledge later on.
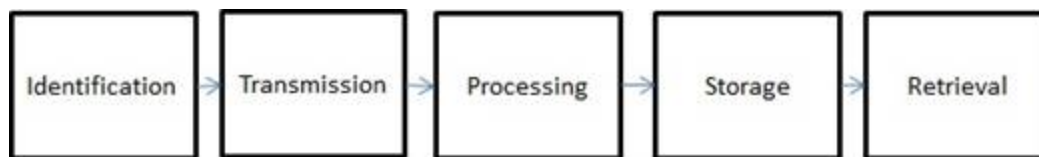

Figure 1. The Process Of Knowledge Acquisition.

King et al. (2008) describe knowledge creation and knowledge acquisition as different processes. In knowledge creation the new knowledge is usually created within the company. Knowledge acquisition on the other hand involves the exploration and acquirement of new knowledge from the outside of the company. (King et al. 2008: 167.)

Yli-Renko et al. (2001) have researched young technology based firms and noticed that acquisition of knowledge is a strongly social process. Social interactions and network ties have a positive effect on knowledge acquisition. However, they noticed that relationship strength is negatively correlated with knowledge acquisition. Extremely close customer relations (a high level of trust), diminishes the felt need to observe each other, something which may reduce the cost of knowledge exchange but which may also decrease the value of the new knowledge acquired.

Nemani (2010) describes the difficulty of effective knowledge acquisition. In many cases important knowledge is not even recorded. It is important to extract knowledge from experts into codified form. Interviews, observation, protocol analysis and

brainstorming are useful methods to convert tacit knowledge into paper format. Codified knowledge is easier to organize, locate, share, store and use. Information technology plays a significant role in the sharing and storing of codified knowledge.

2.3.   Sharing Knowledge

To have an impact on an organization, knowledge often needs to be available to a larger group of people. The mechanism for this is the sharing or transferring of knowledge. Both can happen on an individual level as well as on the organizational level, and also between different organizations. Knowledge transfer refers to the focused and purposeful communication of knowledge. In this process the sender knows who the receiver is. Knowledge sharing on the other hand refers to less-focused dissemination of knowledge (King et al. 2008).

According to Wang and Noe (2010: 116) there are various factors affecting knowledge sharing on the individual level: environmental factors, individual characteristics, and motivational factors. These factors can also become barriers to knowledge sharing. On the organizational level, Dyer and Hatch (2006) and Dyer and Nobeoka (2000) have identified several barriers to knowledge sharing. These barriers are: (i) the capacity of the recipient to absorb the knowledge; (ii) the credibility of the source of knowledge; (iii) the motivation of the source or recipient of knowledge; (iv) a difficult relationship between the source and recipient; and (v) causal ambiguity due to complexity.

Dinca (2011) raises an important question of knowledge sharing that should be considered both on the individual and organizational levels: what is the purpose of knowledge sharing? How and for what purpose will the recipient use the knowledge? All knowledge is not important for all recipients. We all know what it is like to receive too much information, especially via electronic channels. On the other hand, Shih et al. (2012) note that the efficient operation (of a supply chain) requires all information to be available at the right place and on the right time.

Liu and Liu (2008) discuss knowledge sharing in large-group settings and small-group settings. A large-group setting means that knowledge is shared with a large number of recipients, e.g. via training (internal or external) or via electronic channels. A small-group setting means that more private knowledge is shared between close coworkers. According to the study, the nature and the source of the knowledge has an effect on which setting employees are likely to choose in forward the knowledge. Non-codified tacit knowledge from internal sources is most likely shared with others within small-group settings and codified explicit knowledge is more likely shared within large-group settings. (Liu and Liu 2008.)

Shih et al. (2012) distinguish between information sharing and knowledge sharing. Information sharing can be defined as the automatic, day-to-day operations through which explicit knowledge is shared. When a situation becomes more complex and unique, knowledge management and knowledge sharing tend to concentrate more on tacit knowledge. Both explicit and tacit knowledge are often needed for decision making. (Shih et al. 2012.)

3.   Acquiring And Sharing Knowledge In Practice

3.1. Research Method

The data gathering for this research was done by theme interview. Theme interviews allow interviewees to freely discuss given themes, and choose topics depending on what they find important. The themes used in the interviews were 1) creating and acquiring new knowledge, 2) sharing knowledge, 3) utilizing knowledge and 4) storing knowledge. In addition to these themes, the role of information technology was highlighted. Interviews were conducted in six small and medium sized companies in the metal and machinery industry of Western Finland in 2010. All the interviews were recorded and transcribed. The N-Vivo software was used for analysis.

3.2. Acquiring Knowledge

According to our research, there are many sources of knowledge available to SME companies. A company's network and its members (customers, importers, suppliers, retailers and partners) are all important sources of the everyday knowledge flow of a company. The situations in which knowledge is acquired are often social processes: telephone or face-to-face conversations, exhibitions, meetings, etc. Also public sources are seen as vital, e.g. public authorities and standards. Training days, courses and seminars are events where the acquired knowledge is especially well related to know-how. Employees can be seen as a knowledge source, especially in the case of employee initiatives. Some companies have used consultants to do consumer analyses. Most media - Internet, Google, portals, magazines, newspapers, literature and television - are also considered good knowledge sources in these companies.

The acquired knowledge can be social knowledge, maybe written down on a piece of paper but not present in any information system. Alternatively the acquired knowledge can be codified into a database or it may already exist in codified form when acquired. The interviewed SME companies stated that their interests focus especially on knowledge concerning their own products, customers' purchasing motives, their delivery reliability, competitors and market information.

3.3. Sharing Knowledge

Knowledge sharing across the borders of the company can be viewed from two perspectives: sharing knowledge with customers and sharing knowledge with suppliers. In general there seems to be great variation in attitude towards knowledge sharing in these companies. Some companies want to control all knowledge and share as little as possible, while other companies feel that sharing as much knowledge as possible is the best course.

There are various channels to use when sharing knowledge with customers or suppliers. E-mail and telephone are typically the most often used. Some companies still use fax and in some companies ERP- / order handling systems or databases are used. General knowledge about for instance the products is often shared over the Internet. The companies also highlighted the role of face-to-face communication: knowledge can be shared in exhibitions, meetings, training sessions, etc.

Information technology was seen as a good tool for sharing knowledge, but there are some challenges related to it, however. The pure amount of e-mails can become a problem: the document sizes can become too large and in general the great number of e-mails received can cause important e-mails to be forgotten. When sharing knowledge over the Internet, one has to think carefully about what is safe to show in public. Also updating the online knowledge can be problematic. Databases and ERP-systems can help a lot in knowledge sharing but they require special features when used across the borders of the companies.

The companies also expressed some future needs and hopes regarding information technology. From both perspectives (customers / suppliers) the main objective was to handle the orders electronically. 'Easy-to-use' and 'not-too-expensive' systems are needed to fulfill this objective. The companies feel that various portal-systems, ERP-systems and databases might help in knowledge sharing. However, these systems should not be too complicated (people in these companies are not IT-experts) and should not cost too much (the companies are small or medium sized and do not have the resources for expensive systems). It is important to note that the current systems on the market were not very highly valued by these companies. There are many different systems on the market but they are usually not compatible with each other. Information may need to be inputted manually even when received from another system within the same company. It is obvious that different systems used by the company and its customers / suppliers are a cause of problems.

However, the IT systems are not always to blame - some interviewees emphasize the role of the users. Common, agreed-upon ways of working are needed. And when these processes are established, all parties should strive to follow them. When a system is made available, all concerned individuals/companies should do their best to use it and not fall back on the old ways. Sometimes the old routines should be reviewed. It is easy to say that the system does not support the way a company does things, but it should be noted that the old way of doing things may not be the most effective one.

4.   Discussion

Nemani (2010) has recognized that computer technology is a good assistant in knowledge acquisition but that it cannot change things on its own. The same phenomenon was seen in our research - conversations, meetings and other social processes were needed to acquire the knowledge properly. Databases, the Internet, portals and magazines were seen as good sources of knowledge but the movements of the market and continuous development dictate the direction of business. Liu and Liu (2008) make the observation that employees should be encouraged to have social contacts with professionals in their own field in order to acquire new knowledge. In our research, employees preferred to acquire knowledge face-to-face from partners, trainers and authorities in order to improve their knowledge resources and businesses.

Our empirical findings show that companies working in networks generally see IT as a potential tool for both knowledge acquisition and sharing. Shih et al. (2012: 72) state that IT can help streamline the processes of a supply chain and thus help manage knowledge in more effective ways. This applies especially when large amounts of knowledge about for instance customer demand or inventory values are shared. Shih et

al. (2012: 73) list a number of IT tools used for knowledge sharing in supply chains: on-line discussions, e-mails, automated order processing systems, EDI etc. These findings are very similar to our own, even if they come from another industry.

It is important to remember that the use of IT in knowledge sharing is only a part of the total knowledge sharing that takes place in companies; face-to-face interactions are also needed (see Wang and Noe 2010: 125; Shih et al. 2012: 79). The role of face-to-face discussions is emphasized when the nature of the knowledge becomes more complex and / or when the IT systems do not support such sharing. As Liu and Liu (2008) state, the nature (tacit / explicit) and source of knowledge (internal / external) will also have an effect on the channels used when sharing within the company.

However, the degree of IT usage and attitudes (for or against it) varies from one company to another. Some companies see more potential problems than benefits in using IT systems and in outsourcing some of the knowledge management (e.g. storing data online). This is supported by the findings of Nycyk (2011) who studied large construction projects and found resistance to the idea of using technology in daily knowledge sharing. However, it was also seen (Nycyk 2011) that problems are not always caused by internal resistance, but rather by companies having IT systems that are simply not compatible with each other (similar findings also by Haapalainen and Pusa 2012). This means that documents may need to be rewritten and data recoded before it can be used in another system. The same problem was brought up in our research: sometimes knowledge is stored in two or three different systems within a company and manual input/ transfer is necessary between these systems.

5. Conclusions

It is important for the companies in manufacturing networks to understand that even if IT systems may help in acquiring and sharing knowledge across organizational borders, they will not solve all the problems related to knowledge acquisition and sharing. The whole process should be planned well and the role of social knowledge processes should be included in these plans. It is also important to think about what will happen with the knowledge later on in the process: who will use it, how can it be shared with the target group within the company, how will it be codified etc.

It is clear that there is a genuine need for new IT systems that are compatible with each other (and with existing softwares). These systems should be easy enough to use, not too heavy and not too expensive. We tend to believe that there is an IT system for every need, that IT systems that can help us acquire and share knowledge easily. In reality, SME companies in manufacturing networks does not support this belief.

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