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A study about the creation and use of knowledge in Elof Hansson AB

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Foreword

We are now living with a the new economy where *the only certainty is uncertainty* (Nonaka & Takeuchi, 1995). Organizations now are operating in a fast-moving global market where customers are increasingly knowledgeable, have a wide range of choices and where the relationship between suppliers and clients is closer than ever before. My thesis takes Elof Hansson, a traditional trading company, as a case study. The *traditional trading company,* from my point of view, is defined as the type that connects the customers with the suppliers through their operation and activities; the profit end is created through the difference between the price the customers pay to the company and the price the company pays to the suppliers. If there is a difference between customer and supplier price and if it is easy for the customers to contact directly with the suppliers to buy products, then why should the customers still buy products from Elof Hansson? This question can be answered by every Elof Hansson employees by the statement:

> *"Because we provide the added value activities for the customer and the supplier neither can do if they directly deal with each other"*

The added value activities are the strength keeping Elof Hansson competitive. Elof Hansson uses its knowledge as the vital source to carry out these activities. Given that knowledge is a crucial source, in order to change to compete and survive, Elof Hansson has to focus its attention on continually creating and using knowledge translating it into values and competitive advantages. In order to understand how knowledge is created and used in MED, I divided the process of creating and using knowledge in MED into two periods of time: short term and long term. In a short term operation such as one project; individuals in MED work together sharing their knowledge, experience and creating new knowledge automatically and subjectively. In my opinion, in order to develop their knowledge for a long-term strategy, organizations should define its existence as well as the structured way in which knowledge is created and used. From this finding I suggest a framework Elof Hansson could use to develop knowledge for long term strategy.

Keyword: knowledge, tacit knowledge, explicit knowledge, knowledge creation, knowledge using, knowledge management strategy

Table of content

1 - Introduction

This chapter introduces the reader to the following contents. The first point is the reason why knowledge and knowledge management are interesting to write about. Next is showing how the research problem can be defined. Then in the last part of this chapter I will introduce the purpose, the description of the methodology used.

1.1 Knowledge and knowledge management in the new economy

We are witnessing everyday the worldwide development of IT, high-tech and R&D activities that have made the cycle of products shorter and shorter. The speed of the business environment change forces organizations to continuously adjust and innovate to compete and survive. Now the length of success that organizations can enjoy depends on their capacity to continually self-renew and reinvent themselves in the industries in which they compete (Hamel, 2002). What makes organizations have the *capacity to self-renew and reinvent themselves?* Perhaps, we all agree that the knowledge of the people working in these organizations is the answer to this question. Knowledge has a key role in helping organizations to gain a competitive advantage. It is no longer is knowledge considered only an individual's personal wisdom; knowledge is now a component of the intellectual capital of organizations (Stewart, 1997).

Organizations nowadays are changing their values and establishing a new focus. If formerly, industrial organizations mainly focused on physical assets, now it is time they turn their focus to the knowledge of their employees. The focus on knowledge as a competitive resource for organizations requires new approaches to management. Managers concentrate their attention on not only learning about knowledge, the environment and conditions in which knowledge is created and used, but also understanding how to manage knowledge and use it to create values for their organizations. Thus, building a knowledge management strategy is a crucial task for organizations. There are many approaches to and research areas into knowledge management strategy. Zack (1999) identifies three research areas relevant for knowledge management strategy. Firstly, which knowledge is unique and valuable? Secondly, how can these resources and capabilities support a firm's product and market

positions? Lastly, the real challenge lies in finding the link between knowledge management strategies and its processes**.** As far as I am concerned, creating a knowledge management strategy that links to business strategy and process is necessary for managers to maximize their organization's knowledge resource and capabilities.

1.2 The problem area

If knowledge is an important resource helping organizations to compete in new economy, the question here is how organizations manage and use knowledge as a strategic resource to create value and carry out the competitive advantage? Knowledge itself is an intangible resource existing in many types and dimensions e.g. tacit and explicit knowledge, know-how, know-what and know-who. In addition, knowledge is different from individual to individual, from organization to organization. For example the knowledge held by employees working in a financial department will be different from the one's working in a marketing department. By the same token the knowledge held by a trading organization is different than that of a consultant. Besides, each type of knowledge is different not only in its form of existence and content but also in the ways it is used and managed. In order to manage their knowledge effectively, organizations must have the capability to define their knowledge and the existence of this knowledge.

To adapt to the fast changing business arena and to keep a competitive position, organizations need not only to utilize their existing knowledge but also to continually create new knowledge. However, knowledge creation and sharing between individual, department and organization is not a systematic or automatic process that it is easy to manage and plan. The process is, rather, continuously evolving and emergent (Bhatt, 2000). To continuously create and use knowledge managers in their strategy making should consider creating a good structure that inspires the interaction between individuals and departments and motivates them to take part in the knowledge creation and sharing process.

Creating a suitable knowledge strategy for an organization is important for managers. The question here is how we can build this strategy and how this strategy can turn knowledge into a competitive advantage for an organization?

Taking these above-mentioned problems and questions into consideration, my thesis will explore how knowledge is created and used in an organization and how an organization builds a knowledge management strategy. My research question is:

- *How does an organization create and use knowledge?*

To answer this question I have chosen Elof Hansson in order to study the process in which an organization creates and uses knowledge. I divide my thesis into three main parts. The first part is knowledge definition. The second is about knowledge creation and use. The third part is about knowledge management strategy. Step by step three parts will answer the following questions:

- *What is the knowledge in Elof Hansson?*
- *How does Elof Hansson create and use knowledge in a short-term operation?*
- *What can Elof Hansson do to develop knowledge in a long-term strategy?*

1.3 Purpose of study

My purpose in doing this thesis is to investigate the process by which an organization creates and uses its knowledge. The focus on the process of creating and using knowledge in case company, Elof Hansson, is divided into two main levels. The first is the short-term operational level. By conducting an empirical study in knowledge creation and usage in one of their projects, I would like to know what knowledge in Elof Hansson is. How can this knowledge can be created and used during and after a project? The second level is the long-term strategy of Elof Hansson. From analysis of the short-term level, I will combine knowledge perspectives with established business strategy and operation in order to suggest some tools an organization may use to develop its knowledge for a long term strategy.

1.4 Methodology

1.4.1 Methods used

Because the subject of my research is knowledge that can hardly be measured and translated into numbers, in my study I used the qualitative method instead of the quantitative. I used a

qualitative method to interpret information from my empirical findings using my own understanding and thinking.

To do my thesis I considered a case study approach as the most appropriate method. Case study implies that the researcher explores a few objects from several angles. The case study is suitable when answers, such as how and why a phenomenon occurs are out of reach for researchers. A case study also gives us the advantage to relatively freely search for information needed. Furthermore, it also allows us the possibility of using a flexible way of collecting information (Yin, 1994).

I chose Elof Hansson Trading House as my case study to investigate the process of how knowledge can be created and used in short term operation in one project and in the long-term strategy of an organization. From when I began gathering information in Elof Hansson, I knew that organization and operations were quite complex involving divisions, departments and partners. The complex in structure as well as the multiform knowledge within the organization, made it difficult for me to do research. Therefore, in order to narrow down my research I focused only on the Machinery Export Division (MED), a division of Elof Hansson.

1.4.2 The study

In my study I used both the primary data, data collected by the researcher specifically for the study's purpose and secondary data, data published for other reasons and the specific research (Yin, 1994), to investigate the confusing regarding to my research question.

To gather the prima data, I used interviews and observations as the major tools. By using open ended questions when interviewing, I intended to follow the process of changing and different understanding about the problem of respondents to formulate my own understanding about the problems. By observing people at work and relating to each other I could find out the problems that in my interview I couldn't do.

To work more efficiently and gather relevant information before each interview, I made a short presentation or sent the questions ahead to interviewees to help them be prepared with the needed information connecting to my study. With the permission of all interviewees, the interviews were taped and then transcribed. In order to increase the credibility and trustworthiness of the study, the interviews were supplemented by written materials

concerning the knowledge and knowledge management in organization. The process of data collection was concluded with a preliminary analysis compiled in a small report, which served to establish trustworthiness, that is, to ensure that relevant topics had been addressed during the interviews and that my reports coincided with the reality of the organization. To begin with, in order to narrow down my research and have an overall understanding of the operation, as well as the strategy of organization, I conducted interviews with the CEO, the group controller, senior advisors at Elof Hansson and the Director of MED. Then, after formulating the problems and my research question, I conducted interviews with people who worked directly with the project in MED such as the Senior Project Manager, the financial manager and Project engineers in order to learn more about the process of doing one project and the way people work with each other.

The secondary data that I used in my research was taken from literature, books connecting to my research area, as well as Elof Hansson publications such as annual reports, the company website, public information and some working files in the project management department.

Thanks to secondary data, I had my own information on the theme of knowledge creation and knowledge management at the beginning of my study. This information was garnered through study in the Master of International Management (MIM) program as well as reading literature and books. From literature there are many conclusions, discussions and information regarding knowledge and knowledge management study so I had to use a method, called *"deduction"*, to choose which information was relevant for my study and make a frame for my empirical study.

With the primary data all the documents from my interviews were read and information relevant to the purpose of the study was noted and emphasized. The information from interviews made it possible for me to identify significant anomalies with respect to the research questions. It was systematized under headings according to the theory that framed the empirical study. Comparing and using both primary and secondary data I could make my own conclusion when writing.

1.5 Summary

This chapter was an introduction and overview to my thesis. Firstly, I introduced the role of knowledge for an organization. The purpose of my thesis is to analyze the process in an organization by which knowledge is managed and from this analysis I would like to build a framework and suggest some tools that organizations may use to manage their knowledge in long term strategy. In order to create a knowledge management strategy an organization must first know what kind of knowledge it should focus on and how this knowledge is created and used. In this chapter I also introduced methods used the research work. In the next chapter I will go into detail and discuss more about each area that I have introduced.

2- Knowledge definition

In this chapter I will introduce two main contents. The first is an introduction into theories connecting to the definition of knowledge, as well the form of existence of knowledge within an organization. The second content of this chapter is about the organization and operation of case company. From understanding the organization of the case company I will define what is the knowledge as well the existence of knowledge within the case company.

2.1 Theory in knowledge definition

2.1.1 What is knowledge?

From a management perspective we consider knowledge to be a resource of the organization and like other resources we cannot manage it if we can't measure it (Kaplan & Norton, 1996). To effectively manage knowledge, managers have to understand the meaning, the significance, the definition and the forms of existence of knowledge. So what is knowledge? This academic question is the subject of a lively epistemological debate. There are many definitions of knowledge but there is still no generally accepted definition of knowledge (Targama& Diedrich, 2000).

Depending on the approach of studying knowledge in literature, knowledge is defined with many diversified meanings. For Shin et al (2001) there are two approaches when defining knowledge. The first uses the concept of a value chain or hierarchical structure among data, information, and knowledge. From this point of view, knowledge can be understood as a production from raw material-information. Information itself is not knowledge. To become knowledge, information has been structured and organized and applicable. The second approach in defining knowledge focuses on the analysis of the process of knowing. In this approach, knowledge can be classified as a belief or the cognitive status of knowing. This belief guides the thoughts, behaviors and communications of people.

From my point of view I follow the first approach to knowledge definition in my thesis. First of all as far as I am concerned information is fundamentally different from knowledge. Information is only a part of knowledge. Knowledge itself resides in humans, results from the process of using, checking, structuring and analyzing the outside information, and holds

an important role in human action. As such, I emphasize the role of knowledge is guiding in action.

2.1.2 Dimensions of knowledge

Since its first appearance, knowledge has been described and classified into many forms and dimensions of existence depending on the characteristics of knowledge and the aspects analyzed. In general knowledge can be divided into two main dimensions: the soft and the hard (Kought & Zander, 1992). The hard dimension of knowledge, considered as explicit knowledge, exists in the *easy to see and use* forms like information system, documents and databases. Thanks to the characteristic *easy to see and use,* the hard dimension of knowledge can be transmitted from one to another without loss of meaning if the receivers and the senders are both familiar with the *context of knowledge*. The other dimension of knowledge, the soft, implicit and tacit knowledge only exists in the human minds, i*n the heads of people* or the cognition of humans. This knowledge is created when individuals interact with each other and with the environment around them. This kind of knowledge is very difficult to clearly define and is something that is unconscious. We can't express this knowledge, we do not know we have and most of the time we are not aware of its existence and as Polyni (1966) said "we know more than we can tell". As a result, it is perhaps more difficult to manage and utilize the soft than the hard dimension of knowledge.

Because the characteristics of knowledge are different from organization to organization and vary depending on the view point when studying knowledge, authors and researchers in literature define the existence of knowledge in the form of hard and soft dimensions in different ways. The hard dimension of knowledge exists in the form of information systems, method, case, principle, manuals and documents, which is easy to manage and use. The soft dimension, on the other hand, exists in the form of skill, experience and idea, which are difficult to manage and control.

Some main forms of knowledge are categorized into the hard and the soft dimensions as shown in the table below.

Hard dimension	Soft dimension
Catalogues knowledge (know-what), explanatory knowledge (know-why) (Millar, Demaid & Quintas, 1997); Hard data, scientific formulate, codified procedures or universal principles (Nonaka & Takeuchi, 1995); Information about customers, products, processes, and competitors filed on paper or in electric form (KPMG, 1998); components (e.g., document templates), frameworks (e.g., ISO 9000), patents (e.g., best practices), and general principles (e.g., organizational vision) (Im & Hars; 1998); methods, tools and cases (Werr & Stjernberg, 2003)	Process knowledge (know-how), social knowledge (know-who) and experiential knowledge (what-was) (Millar, Demaid & Quintas, 1997); individual's action and experience, as well as in the ideals, values or emotions he or she embraces (Nonaka & Takeuchi, 1995, Werr & Stjernberg, 2003)

Table1: Two dimensions of knowledge

In my opinion, the distinction between the hard and soft dimensions of knowledge by the way authors referred to in table 1 is provisionally not permanent. There is not a clear and inflexible boundary between these two dimensions of knowledge (Spender, 1996). There is a dependent and interactive relationship between these two dimensions of knowledge. The relation here is tacit knowledge guides organization, the use of explicit knowledge and explicit knowledge on the other hand creates a common language, structure and narrative form by which tacit knowledge is developed (Werr & Stjernberg, 2003). Because of the unclear and flexible boundary and the dependent relationship between these two dimensions of knowledge, there is continuously a transformation between them, the soft can change to the hard and in return the hard can change to the soft. Nonaka & Takeuchi (1995) stated that the conversion between the tacit and explicit knowledge creates new knowledge. How knowledge is created and used through the conversion between the two dimensions of knowledge is the main content of the next chapter.

2.1.3 Summary

In this section I introduced the different definitions of knowledge and the dimension of existence of knowledge. In defining knowledge, I emphasized that it is created through the process where individuals receive the outside information translating and combining it with their own understanding. The importance of knowledge is being human in their action. I introduced the two hard and soft dimensions of knowledge, tacit and explicit knowledge. If the hard dimension - explicit knowledge is easy to transfer and use, the other dimension - tacit knowledge is difficult to express, use and transfer. In this section I also mentioned that knowledge in an organization depends on the characteristics of both the industry in which the organization is operating and the structure of this organization itself. Taking Elof Hansson as my case study, I will go into detail and define the knowledge of Elof Hansson in the next section, knowledge definition in Elof Hansson.

2.2 Knowledge definition in Elof Hansson

As Kakabadse (1991) stated, in order to effectively manage knowledge one has to understand the organization. Managers need to understand their employees, customers, suppliers and other stakeholders and be able to act on that knowledge in an appropriate way. To define knowledge of Elof Hansson I will introduce its organization, structure, operation and products and services. From my understanding of Elof Hansson I can define what knowledge in this organization is.

2.2.1 Organization and operation of Elof Hansson

Elof Hansson AB's was established in 1897 in Hamburg and moved to Gothenburg in 1914 at the outbreak of World War I. As a trading company Elof Hansson AB's sets up the definition as a company that has to meet the four following requirements:

- Firstly, a trading house must be involved with both import and export. It must also conduct business between countries and markets, regardless of where the house has its headquarters. We call this cross trading.
- Secondly, a trading house must trade in a broad spectrum of goods, but at the same time it must be able to supply the expertise and capacity for product development,

product co-ordination and complicated system solutions within the areas in which it operates.

- Thirdly, a trading house must not have any production interests of its own, no financial ties, which favor individual customers or suppliers.
- Fourthly, a trading house must be able to take responsibility for the funding of its own business dealings and be able to accommodate both political and business risks.
- *(*Elof Hansson *Company www.elof-hansson.se)*

Elof Hansson operates in three business areas: Forest Products (pulp, paper, timber, building materials), Industrial Products (machinery and equipment for the pulp & paper industry, steel, chemicals, industrial products) and Consumer Products (textiles and gloves, consumer electrics, and home appliances).

Industrial products area

The Industrial Products business area is a major area in Elof Hansson, including the three following units:

- The Machinery Export Division (MED) of Elof Hansson AB
- Elof Hansson Industrikomponenter AB and Tubeslans AB

MED is the main unit in Industrial business area. The function of MED is supplying machinery, accessories and complete plant and process segments to the pulp and paper industry, and to the corrugating, converting, printing, packing and sugar industries. MED also assumes total responsibility for construction and refurbishment project including financing, risk management and logistics. Because of the nature of its operations, including the co-ordination of many special functions and activities, I choose MED to analysis the process of how an organization creates and uses knowledge.

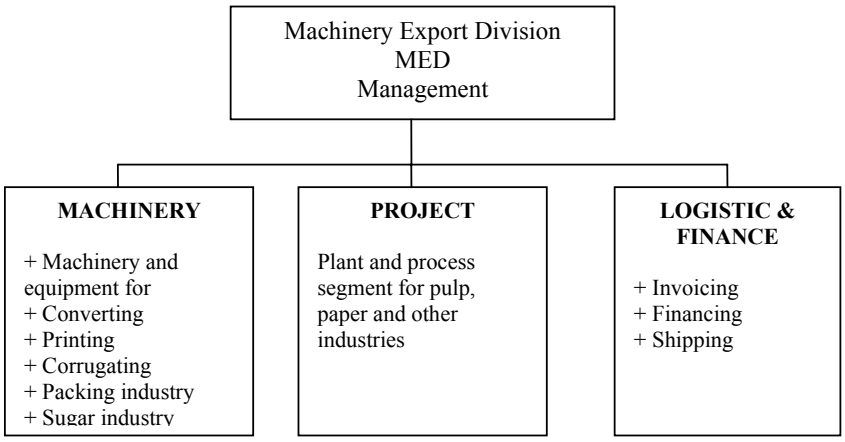

Figure 1: The model of MED

MED is operating as a centralized organization, having worldwide representation through subsidiaries, representative offices and agents. MED's head office is located in Gothenburg, Sweden. The role of subsidiary, representative and agent in the local market is exploring, categorizing and assessing market, customers (finding new markets, products, contacting customers, updating information about local markets…). On the other hand, the role of head office in Gothenburg is processing market information from the local office, finding and contacting suppliers, creating and providing added value activities for customers, suppliers (technical sales expertise, service & maintenance, financing, logistics...), implementing and carrying out the project and also maintaining good contacts with bank, the financial institutions, government and authorities.

The operation of MED can be divided into two main functions:

- The first, Machinery, sells small component, laboratory equipment and machinery for the sugar industry.
- The second, Project, is providing customers with complex product solutions that demand a range of different machineries to be installed together.

In my research I focus my attention on the second function of MED, Project.

2.2.2 Definition of knowledge

Working in a multinational environment the main function of MED, as a trading organization, is buying products from suppliers, adding up the value by providing services and solutions and selling this to customers. The role of MED here is not only passive as intermediary, but it is instead a highly-specialized knowledge company in each of its specific business area (www.elof-hansson.se). The relationship between MED, suppliers and customers is created through the three main flows; financial, product and knowledge. In order to define the knowledge of MED we should first understand the product flow from supplier to MED and finally to customer. MED buys products from suppliers, adds value to this product and provides the customer a complete package. We can see this relationship in product flow between MED, customer, supplier by the below figure:

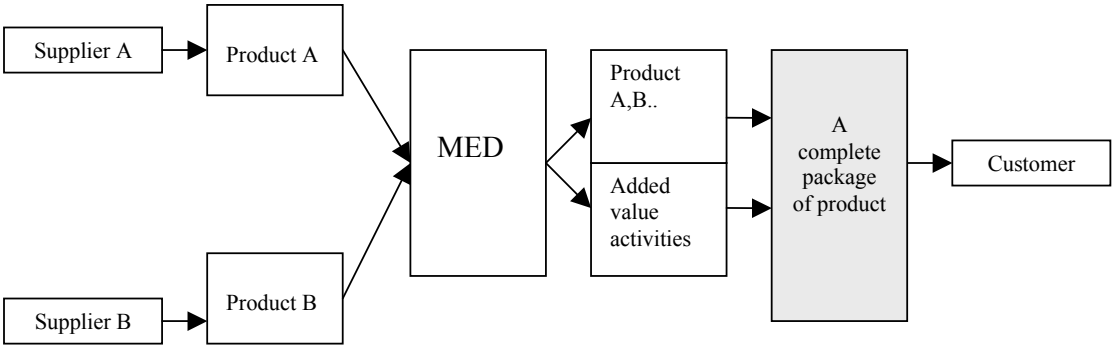

Figure 2: The relationship between MED, customer and supplier

The added value activities that MED provides to the customer as Peter Hentz, Director of MED, emphasized:

"It is strength of our company"

To provide the customer the products as well as the added value activities such as financial and logistic solutions, MED needs to know first about the customer and supplier, second, about the products it provides and third about the services that it provides to the customer. From a knowledge angle, in order to deal with a customer and supplier MED can have two main types of knowledge: market knowledge (knowledge about customer, supplier, and products) and added value activities knowledge (I call that MED knowledge). Next I will go into details and introduce each types of knowledge in MED.

Market knowledge

As an independent global trader Elof Hansson continuously explores, categorizes and assesses markets all over the world. The market knowledge of Elof Hansson is knowledge about product, customer and supplier. Such knowledge is often embedded in explicit forms such as like the operating rules and practices in a specific market, the customers, and suppliers as well the competitors. One notion a respondent from MED stated is

> *"Market knowledge in MED comes from suppliers not only about the product itself but also about the objectives and future development of the suppliers. What experience does supplier have in its specific field of operations? What experience does it have of international business? Which are the main competitors? How can MED enhance the supplier operations? This knowledge is created through the*

frequent contact between MED and suppliers as well as the experience of MED sale experts for a long time working with them".

One important part of market knowledge is tacit knowledge existing in the form of experience and skill of the sales force and managers in MED. With their experience of a long period of time working in market, people from MED know how to work with people, companies and government from one local market; they know the economics and political situation, the different laws, culture and practice between local market and the host country.

MED knowledge

Providing the customer with the added value activities is the strength of MED. The knowledge that helps it carrying out these activities is the competitive edge of the organization. MED provides customers financial, logistic, project management, service maintenance and technical advice services. Knowledge of MED is mainly centralized in the following domains:

Financial knowledge

The role of financial services is very important for MED in dealing with customers and suppliers, holding the key role for the success of the company. The financial department is responsible for handling both commercial and political risk, managing risk for project, managing currency risk in working with one project abroad, together with Elof Hansson's specialized partners (banks, credit institutions, and insurance companies) financial departments ensuring and controlling the risk of transaction between the MED supplier and customer. Knowledge from the financial section includes both the tacit and explicit dimension. The explicit knowledge is the universal and general methods, regulations connecting to financial service such as creating letters of credit, debt collection, risk management, insurance, and interest rate. These methods and regulations can be seen in documents, working files, methods and databases from financial department. On the other hand the tacit dimension of knowledge is the experience of people working in financial department. With their experience people know what tools and methods are relevant, know how to use methods and tools to transmit their action, know which bank and financial institution MED can work with in a particular project...The experience guides the actions of employees in choosing and using tools and methods to work in one particular project.

Logistic knowledge

The role of the logistic department is finding transportation solutions for customers. Knowledge from this department also exists in both the tacit and explicit dimension. The explicit dimension here is the information about the transportation companies. This includes the information about the company, the service, and the distance in which the transportation companies can transport a product…Another explicit knowledge in logistic department is the method of calculating the cost of transportation. The tacit dimension of knowledge in the logistic department usually exists in the form of employees' experience. For a period of working time employees know how to work with transportation companies, how to arrange the transportation from supplier to the customer, how to reduce the logistic cost.

Sales expertise knowledge

The role of sales expertise in MED is important. Sales expertise here is an employee who has a long period of time working in the head office and in subsidiaries as well representatives of MED all around the world. As a sales expert, an employee has social knowledge, commercial knowledge and technical knowledge. The social knowledge is know-how to create a relationship with partners to sell product, know with whom a company should work. The commercial knowledge here is knowledge about product e.g. the price, the market as well the quality of product. Beside these two types of knowledge a sales expert also has deep technical knowledge about the products and machineries that MED provides. With technical knowledge a sales expert not only knows the main functions of a particular component, machinery but also knows how to coordinate and install them together in large projects. Beside the tacit dimension of knowledge as their experience, sales experts also have the explicit dimension knowledge about products in explicit form. The explicit dimension here exists is technical manuals, instructions and descriptions about the product.

Project management knowledge

This department is responsible for running a project, starting with planning, coordinating, financing and finishing with delivery and implementation. The project department holds an

important role in the overall process of MED. The explicit dimension knowledge of this department is general regulations, methods and models as well as the process of how to deal with and manage a project. On the other hand, the tacit knowledge is the experience of employees and managers. People working in this department not only have in-dept knowledge about the product that MED provides but also the knowledge of how to arrange and relate the operation of other departments within organization in one project. People from project management know how to connect and use knowledge about people from other departments, how to facilitate people working with together and sharing their knowledge.

2.2.3 Summary

In this section I put forth an overview about the operation and organization of Elof Hansson. As noted by Elof Hansson, a trading company is not only buying and selling products to customers, also providing them services that the company has specialized knowledge in. From this notion, I think that the company's knowledge comes from the products and services that company provides to suppliers and customers. In order to define and understand the knowledge in Elof Hansson firstly I introduced the organization and the operation of Elof Hansson. What does Elof Hansson provide to customer, supplier? How does Elof Hansson work to carry out these services?

Because the operation of Elof Hansson as well as the services it provides to customer are multiform and complex, and in order to narrow down my research I chose MED, a division of Elof Hansson, to study in my thesis.

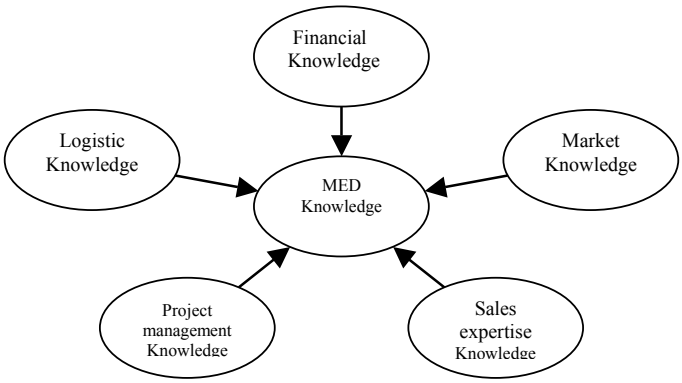

Figure 3: Knowledge domains in MED

From my understanding about the organization of MED and the products and services it provides, I divided knowledge of MED into five domains: market knowledge, financial knowledge, logistic knowledge, sales expertise knowledge and project management knowledge. Each of these five domains of knowledge includes both the tacit and explicit dimension. The tacit dimension of knowledge exists in the form of experience and skill of employees. I think it is very important in the knowledge base of MED. On the other hand the explicit knowledge of MED exists in the form of methods, tools, formulations and databases as well as technical manuals and instructions about products used in the financial, logistic and project departments.

Working in MED headquarters employees not only have in-dept knowledge about the products and services the company provides. This knowledge can frame problems and select, integrate and augment information, choose methods to create understandings and answers for each problem that they face during the working time (Teece, 2000). Beside this knowledge employees also have very important knowledge is social knowledge and experience. With their social knowledge and experience people from MED know with whom their organization should deal with in each distinct country and project. Know how to work and manage local people. Know how to work with other social organizations.

This knowledge is something connected to skills and personal knowledge of people, both experts and managers of MED. It is not available or maybe managers from MED don't want to express and write down this kind of knowledge.

When studying the structure of MED I tried to understand why MED works as a centralized organization while its operation need to be flexible in working. All information from the local market is sent to the headquarters to process. However, a close relationship to share and use knowledge and experience between subsidiaries as well local representatives is beneficial and good for both the operation of subsidiaries and headquarters. In MED this relationship is not clear or I can say that it doesn't exist. The question here is why managers from headquarters want to process all information and knowledge from each local market? For me there are two reasons why managers in MED want to do that. The first reason as a respondent stated

> *"The strength of MED is the capacity of providing financial and others service when working with customers and suppliers so we want to process it at our headquarters"*

The second reason is because of the differences of policy organization in managing and developing from each local market. For example regarding the policy of using people and

collecting information, MED wants to keep control of and process all information flow within the organization.

Because of this reason the experience as well the tacit dimension knowledge that I referred to in my definition of knowledge is mainly connected to the specific area such as financial, logistic and project management not to the knowledge that managers use to manage people and relate with other social partners of a company.

3 - Knowledge creation and use process

In this chapter firstly I will introduce theory perspective in knowledge creation and the usage process. To go into details and answer the question how knowledge can be created and used I also introduce and analyze the process of creating and using knowledge in a short term operation in case company.

3.1 Theory in knowledge creation and using process

3.1.1 Knowledge creation process

As stated in the knowledge definition chapter, knowledge exists in two main dimensions: the hard and the soft dimension. The soft dimension of knowledge is more difficult to manage and use than the hard one. The soft and the hard dimension here correspond to what Nonaka & Takeuchi (1995) model called tacit knowledge and explicit knowledge. The explicit knowledge dimension is easy to handle and manage but a great amount of organizational knowledge exists in a form of highly personal and a context-dependent one which belongs to tacit knowledge. Otherwise tacit knowledge dimension plays an important role in organizational knowledge because explicit knowledge itself, know-what, cannot create action for an organization without the support of tacit knowledge, know-how (Duguid, 2003). Both dimensions of knowledge are parts of organizational knowledge, resources of organization and have a dependent relationship. The task for knowledge management here is not to focus on any one of these two dimensions of knowledge but to combine them to continuously create new knowledge and use this knowledge to create values and competitive advantage for the organization. In their book "*Knowledge creating company*" Nonaka & Takeuchi (1995) stated that the interaction between tacit and explicit knowledge creates new knowledge. From this viewpoint Nonaka & Takeuchi introduced a model in which knowledge is created and used through four steps as follows:

- Socialization from tacit to tacit knowledge
- Externalization from tacit to explicit knowledge
- Combination from explicit to explicit knowledge

- Internalization from explicit to tacit knowledge

As such, the SECI (Socialization, Externalization, Combination and Internalization) model of Nonaka & Takeuchi only put little attention into the relationship and interaction between two types of knowledge during the process of knowledge creation (Werr & Stjernberg, 2003) and represents only a Japan-specific nature (Martin & Nigel, 2001). In the context of my thesis, nevertheless, without taking into consideration the context as well as the conditions for the process to happen, I find this model useful since it helps to form an idea of how knowledge can be transferred between the two dimensions to create new knowledge. The SECI model can be presented in details as follows:

Socialization is process connected to the group working process. In this step, tacit knowledge is leveraged through shared experience between individuals. By observation, imitation, and practicing individuals can gather tacit knowledge directly from others without using any form of documentation. The socialization process usually occurs when people learn new skills when involved in on-job-training activities (observe how colleagues solve problems and interact with new technologies, explain and give reasons for their own actions) and the product developers create new ideas about products by meeting and talking with and gathering knowledge from understanding the view points of customer.

Externalization is a process of turning tacit knowledge into explicit concepts through the use of metaphors, analogies, or models. It is hard to conceptualize an image and express its essence mostly in language so to help the conversion efficiently and accurately, there is a need for promoting interaction and reflection between individuals. The reflection and interaction should be continuing until the new concept is shared and understood among all members of the group.

Combination is a process of creating explicit knowledge by combining different sources of explicit knowledge. This process has roots in information the processing of an organization. People can exchange and combine knowledge through communication channels such as telephone, network meetings or through processing the existing explicit knowledge in the form of computer data bases, documents.

Internalization is a process of turning explicit knowledge into tacit knowledge. This process is closely related to organizational learning. Experiences through other processes are internalized into individuals' tacit knowledge base in the form of shared metal models or technical know-how.

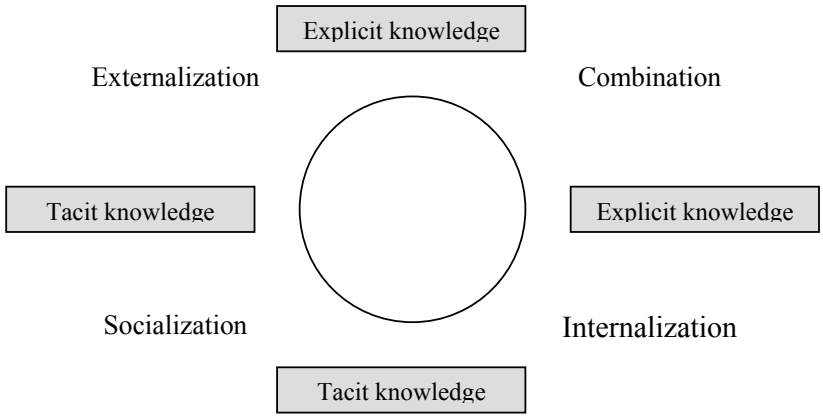

Figure 4: SECI model (Nonaka & Takeuchi, 1995)

The SECI model of Nonaka & Takeuchi helps us understand the process. The two dimensions of knowledge are shared and converted to create new knowledge serving organizational purposes. It can be seen from this model that tacit can be created and used through two channels. The first is through sharing experience and knowledge between individuals *(socialization)* and the second is through learning, absorbing explicit knowledge *(internalization)*. Explicit knowledge, on the other hand can be created through converting and codifying the tacit knowledge of individuals into explicit form *(externalization)* and through managing, combining and using existing explicit knowledge *(combination)*.

Depending on the dimensions of their knowledge, organizations may choose a suitable method to create and use their knowledge. For instance, if their knowledge mainly exists in explicit form, organizations should focus on developing databases and IT system as well to develop and create their knowledge.

One crucial point for organizations in managing their knowledge is that knowledge creation is not a systematic process that is easy to plan, manage and of course organizations can't create knowledge by themselves. According to Nonaka & Takeuchi (1995), organizational knowledge creation is a spiral process, starting at the individual level and moving up through expanding communities of interaction, crosses sectional, departmental, divisional, and organizational boundaries. Tacit knowledge at the individual level, the basic of organizational knowledge, often triggers a new cycle of knowledge creation. To be continually creating and using knowledge, organizations should either encourage

individuals to participate in knowledge creation process or create an environment to help them meet each other and share their knowledge.

3.1.2 Individual knowledge vs. Organizational knowledge

In the above-mentioned sections, I have presented the definition of knowledge, the distinction between the two dimensions of knowledge and the knowledge creation process through the conversion of tacit to explicit knowledge. In this section I would like to introduce other aspects of knowledge namely individual knowledge and organizational knowledge.

To understand the knowledge of an organization, we first have to understand the concept of organization itself. An organization can be understood to be a group of people intentionally organized to accomplish an overall, common goal or set of goals (McNamara, 1999). In organization, although each member contributes something different they must all contribute toward a common goal (Drucker, 2001). To contribute to the "*organizational goal*" each individual is responsible for taking a part of organization's work. When working individuals face problems and need to find the suitable knowledge to solve them. The knowledge that individuals create and use when facing and solving problem is individual knowledge. For Løwendahl (2001) individual knowledge usually exists in three types. The first is information based knowledge, task-related knowledge, so called "*know-what"*. This kind of knowledge is explicit and usually exists in the form of document, database and information system. The second type is experience based knowledge. This knowledge exists in the forms of know how, subjective knowledge and experience. The last type of individual knowledge is personal knowledge. This knowledge exists in the form of aptitudes, talent, artistic abilities, creativity, intuition and social relation. The experience based as well personal knowledge is tacit knowledge and it is the main source of individual knowledge guiding the way an individual creates knowledge. From my point of view the experience based knowledge can be transferred from one to another by face- to- face communications and can be learned by doing, watching and observing. This knowledge can also be codified into explicit forms like document, database that help people use this knowledge easily when needed. The personal knowledge is the most difficult not to say impossible to transfer and

use within an organization. For example individuals cannot learn artistic ability from one other because it is innate ability of people.

In everyday of working, living, studying people continuously use, create and gather knowledge to solve problems they face. I think individual knowledge is developed through two main channels: from individual's self development (e.g., expertise, skills and educational background, etc) and from interaction with other outside sources (e.g., sharing and changing knowledge with employees in other organizations, with market or environment, experience, etc.).

When organizations face problems each individual within the organization with his/her own individual knowledge has a responsibility to take part in solving it. If the problem is not complex, individuals can resort to his/her own individual knowledge to solve it. In the case of a problem is complex, the task for each individual is thus, highly interdependent. An individual cannot solve the problem by him/herself and he/she has to collaborate with others using his/her individual knowledge, sharing and creating new knowledge that serves to solve the problem. From an overall viewpoint I call the knowledge that an organization uses to solve a problem organizational knowledge. Organizational knowledge here, from the perspective of problem facing and solving, not only is a combination of individual knowledge but also includes a planning, controlling and coordinating systems that guide individuals to work and share knowledge with one another. The relationship between organizational and individual knowledge here is distinct yet interdependent (Bhatt, 2002). If we view an organization as an open system connecting with other factors from the outside environment in order to solve a problem, it need not only use knowledge from employees but also use and rely on a knowledge source from outside. For example, a the company hires a consultant company to solve a problem in a case when people within company cannot. From the open system point of view we can see that organizational knowledge includes two main sources: the internal knowledge base (e.g., the combined knowledge of individuals, or learning by doing and using, or investing in R&D activities, etc.) and external knowledge base (e.g., from the relations to external partners like customers, suppliers, high-quality research institutions, etc.). The relationship between individual knowledge, organizational knowledge and internal external knowledge can be viewed in this model below:

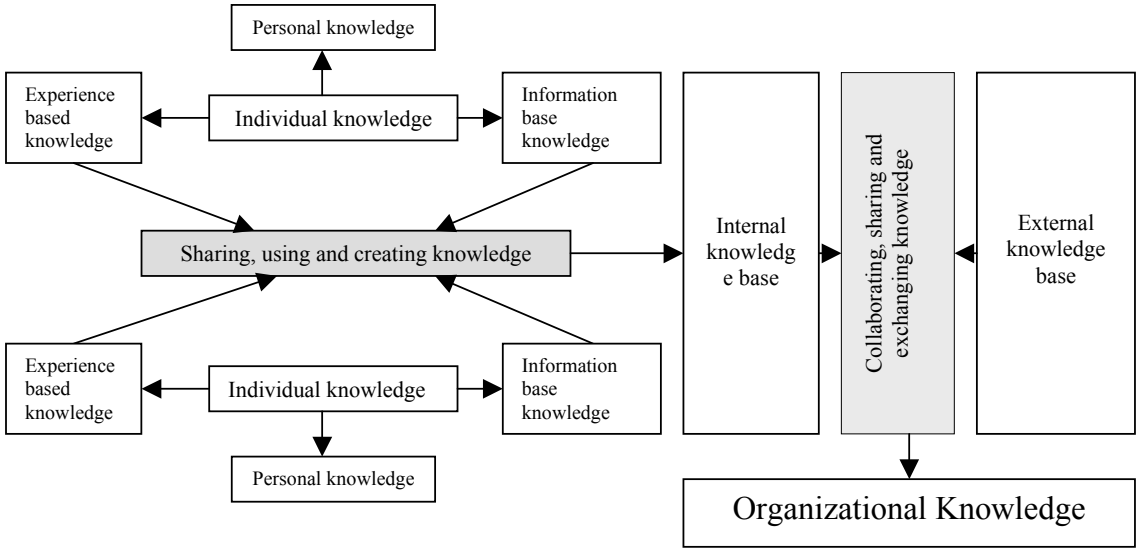

Figure 5: Individual knowledge and Organizational knowledge

Because organizational knowledge is a combination of two main sources: internal and external knowledge since the internal and the external source themselves include both tacit and explicit knowledge, organizational knowledge exists in both forms of tacit and explicit knowledge, too. The explicit dimension of organizational knowledge exists in the form of information system, databases, documents, instructions, and regulations, etc. The tacit dimension of organizational knowledge is the collection of individual tacit knowledge (experience, capacity, skill and know how).

It can be seen from figure 5 that organizational knowledge can be developed through two main channels: through developing the internal knowledge base and through collaborating and sharing knowledge with external partners. Firstly, to develop the internal knowledge an organization may focus on developing *individual knowledge* (i.e., through training, learning and self develop), d*eveloping the information based knowledge* (e.g., upgrading databases, using IT network to support the process of transferring, using and analyzing information ,etc.) and *facilitating individuals to collaborate, share and exchange their knowledge*. Secondly to develop the external knowledge, an organization may focus on the capacity of its individuals to absorb the new knowledge from outside and develop the channels to connect with the outside partners (e.g., creating a close relationship with customers, suppliers, Consultant Companies, Research institutes and universities, etc.)

It should be noted that the process of using and sharing knowledge between individuals in organizations as well as within an organization itself and its outside partners is important because it creates new knowledge for the organization in solving daily problems, paving the way to the development of organizational knowledge. However, this process is difficult and demands a great attention to facilitate from organization. What difficulties organizations are faced with when facilitating the knowledge sharing and using process is the main subject of the following part.

3.1.3 Barriers of knowledge sharing

People are working in increasingly complex environments where their ability to navigate and utilize information, learn new skills and feel comfortable in ambiguous work situations, has become as important to their success as their academic is. To be successful in this environment, people need to continuously acquire, create and use knowledge to guide them in action and create value. In order to do so, people have to take part in the knowledge creation process, sharing knowledge with others, using knowledge and creating new knowledge. Knowledge sharing is important for people. Nonaka & Takeuchi (1995) note that if individual knowledge is not shared with others, it will have much less effect on the organizational knowledge base. The knowledge sharing in the notion of Nonaka & Takeuchi here doesn't mean that all knowledge can be shared between all the individuals in an organization because it is would be inefficient, if not to say impossible to do. The key element in knowledge sharing here is the receiver receives potentially useful knowledge and utilizes this knowledge in his own operations (Minbaeve et al, 2002). The goal of sharing knowledge is the right knowledge transfers to the right person to do the right action. To carry out this goal organizations should first understand how an individual gains and shares useful knowledge from and with others to enhance the efficiency of the organization. And how difficult is this process. To investigate these issues we can go into detail to understand the factors of process (the sender, knowledge to share and the receiver) and make sense of the barriers in sharing knowledge.

The sender: we can basically understand the sender here is the person who owns knowledge. The task of organization is acquiring the sender's knowledge, providing it to others and

serving for an intended goal or purpose. Because knowledge is an important resource for organizations in today's economy, the power is in the hand of the person who has the knowledge. When holding important knowledge people may fear a loss of hegemony when they share knowledge with others (Hippel, 1994) or they my guard their information and selectively release it (Gilmour, 2003). Perhaps, it is agreed that the more valuable the knowledge is, the more difficult for it to be shared. As I state in my model on the relationship between individual and organizational knowledge, the important task for organization here is to facilitate the process of sharing, using knowledge between individuals, creating new knowledge and transferring knowledge to value. Thus there is a conflict between individual and organizational desires to develop knowledge (Løwendahl et al, 2001). On the one hand, an individual wants to keep his/her own individual knowledge. On the other hand, manager wants to develop the knowledge required for competitive advantage and minimize dependence on specific individual. Therefore, to accelerate and motivate the knowledge sharing process, in my opinion, both the individual and the organization in this process should be aware of the opportunity to exchange their knowledge. What is more, they should be aware that the knowledge transfer is valuable for both parties. Besides, they must be motivated to pursue the knowledge sharing and be interested in applying this knowledge into their own activities. Organizations should encourage their people sharing knowledge with rewards for knowledge creation and contribution (Earl, 2001) and create an organizational culture where individual understand the benefit of sharing knowledge and are always *"ready to share"* with others.

Another challenge for the knowledge sharing and using process from the sender position is that the sender usually is not aware of the existence of their knowledge. They do not know *what they can share and what they will share* (Duguid, 2003) and how to express and share it with others. To help people become aware of their own knowledge and share it with others, organizations may create a knowledge map or domains of knowledge for both individual level and organizational level. The aim of the knowledge map is to record and disclose who in the organization knows what (Earl, 2001) which helps organizations to connect individuals who know with individuals who need to know.

The receiver: The problems that often face the receiver in the knowledge sharing process are: limited knowledge absorptive capacity (Simpson & Pusak, 1995), no information about

knowledge existence of other (Huber, 1991), the *'Not invented here'* syndrome (Hu et al., 1998) and limitation in the capacity to institutionalize new knowledge application (Szulanski, 1996). The problem of limited knowledge absorptive capacity can be due to the differences in educational background between the sender and the receiver as well as the content of knowledge shared. When receiving knowledge, the receiver can't interpret, understand and use the knowledge of the sender with meaning and efficiency. This problem can be solved through increasing the individual knowledge base, requiring an increased emphasis on educating and training people, etc. The lack of information about existing knowledge often appears in organizations where individuals do not have a close relationship with one another or they do not know about knowledge of others. To solve this problem, organizations may create a network of relationship between their people as well as the organizational units. A close relationship in organization can help people realize and define the work of others and thus, see the knowledge of others. Another task an organization may try is to create an organizational knowledge map, knowledge domain and database. By using the knowledge map, people in organizations can see what knowledge they have at present, what knowledge needed to do their work and where or from whom they can gather this knowledge in the organization.

The *"not invented here"* problem is connected to the culture of the organization. In this situation an individual does not want to accept the idea or knowledge from others or from outside. This problem affects the knowledge changing and developing of the organization. To overcome this problem, organizations should create an *organization knowledge culture* that motivates individuals not only to be ready to accept knowledge from outside but also have the responsibility to adapt it in his/her own situation and create new knowledge from it.

The transferred knowledge: One important factor that needs to be considered in knowledge sharing process is the characteristic of knowledge that people want to share with others. Kalling (2003) comments that the nature of the transferred knowledge is often addressed as an important factor in the knowledge sharing process. In the knowledge sharing process when the receiver receives knowledge from the sender and translates it into his/her own understanding and action he/she cannot fully understand the shared knowledge. The reason for this problem is because the *context-dependent characteristic of knowledge* (Stopford,

1995) may make the shared knowledge difficult to understand. This problem may arise because people do not share the same context and they have a weak collocation with each other (Appleyard, 1996); they don't have a friendly relationship with and believe in each other or the channels of communication cannot support the sharing process.

In order to apply knowledge from another context, the receiver has to understand the context from which knowledge is created as well as the differences between the sending and receiving context. An organization may create a close relationship between both the sender and the receiver by creating a network of communication, or a community of practice or learning. Through taking part in these activities people can understand each other's actions and the background, which is helpful for achieving knowledge with a high level of true meaning and efficiency.

From literature and practice we can find out many barriers that make organizations fail in managing their knowledge. But what is the most common barrier? In his study of the failure in knowledge management within organizations Gilmour (2003) has found the following information:

Tacit recently commissioned a Harris poll of 536 professional, managerial, and technical knowledge workers in companies with 1000 or more employees to ask the workers how they though their companies handled knowledge sharing. Across the board, these employees reported that knowledge sharing fell far short, despite and abundance of collaboration tools

Percentages of employees who said the following:

- Some people in the company can help me do my job better: 67%
- I don't know how to find these colleagues: 39%
- Work is often duplicated because people are unaware of each others work: 60%
- Opportunities to innovate are missed because the right people don't work together: 54%
- Wrong decisions are regularly made because employee knowledge isn't effectively tapped: 51%

Source: Gilmour (2003)

From results of the Gilmour study we can see that the failure of knowledge management mainly happens because people and organizations are unaware of about the existence of their knowledge, therefore, they cannot tap into and develop their knowledge effectively.

The necessary task for managers now is helping people within their organization working close together, realizing their knowledge and sharing it with each other. How managers do it is the topic of the next chapter.

3.1.4 Summary

In this section I introduced the SECI model of Nonaka and Takeuchi, showing the way knowledge is created through the conversion between tacit and explicit knowledge. From this model I found out that there are two ways of using tacit knowledge. Firstly, tacit knowledge can be transferred and used directly from one to another by face- to- face meeting or by learning doing, watching (i.e., internalization process). Secondly, tacit knowledge can be codified to explicit dimensions such as documents, databases and information systems that are easy for others to learn and use (i.e., externalization process). Explicit knowledge can be accessed through the using of databases and IT, accelerating the process of changing information (combination) and through training programs (internalization).

In this section, two levels of knowledge, and another perspective in dealing with knowledge in an organization, are also introduced. They are organizational knowledge and individual knowledge. I built a model on the relationship between individual knowledge and organizational knowledge. Using this model I stated that to develop organizational knowledge organizations must first develop their internal knowledge by facilitating individuals to collaborate with others in sharing, using, raising individual's capacity of accepting and applying knowledge and creating new knowledge. Organizations secondly may develop the information-based systems as well as communication networks that help knowledge to be easily transferred and used within organization. Thirdly, organizations may have a close relationship with the outside environment, for example with customers, suppliers, research institutions, universities and so on. In each of the three ways above mentioned of developing organizational knowledge, there is always a knowledge sharing and using process. When sending and receiving their knowledge, both the sender and the receiver probably encounter difficulties and barriers. The barriers of sending knowledge mainly come from the three factors involved in the process. From the sender's position, they do not want to share their knowledge; they do not realize the existence of their

knowledge. From the position of the receiver, they have a limitation in absorbing and institutionalizing new knowledge application, they have no information about the knowledge existence, they have the 'Not invented here' syndrome. From the position of the knowledge to be shared, the characteristics of knowledge, which are tacit and context-dependent, make it tough for the receiver to translate this knowledge with full potential and meaning. That, in turn, makes the use of knowledge insufficient.

3.2 Process of creating and using knowledge in Elof Hansson

In this section I will introduce how Elof Hansson creates and uses knowledge in its short term operation involved in one project.

3.2.1 The general process in dealing with one project

Working on projects is the main operation of MED. The project is responsible for taking care of customers who wants to buy machinery that is technically complex and requires installing many small machines or equipment together. To provide the customer with this kind of product MED has to not only coordinate the operation of departments and individuals within the organization, but also has collaborate with outside partners. The process involved on completing one project is complex and takes time depending on the characteristics of the product as well as the type of customer and supplier. In general the process of completing one project in MED can be divided into three steps: the preparation, the contracting and the implementation step

The preparation step:

A project in MED often starts with the information about the customer that has been gathered and sent to the head office. This information includes the commercial and the technical content. The commercial information includes the demand (quality, quantity) for the product made by the customer, and the customer's financial information. The technical information includes the technical demands of the product.

Before deciding to deal with this customer MED needs to ensure that the products as well as demands of the customer are suitable for the operation of MED or not. In detail, the commercial information will be sent to and processed in the financial department. The

question that that financial department needs to answer here is does the customer have the capacity of paying for the product or not? When the financial information of the customer is checked and the result is positive, the project manager will send the technical information to the sales expert and engineer to check. The sales expert and technical engineer are responsible for checking the technical aspects of the product. They answer the following questions: Is the product that the customer needs suitable to the MED operation or not? Can MED put up a good offer? Does MED have suppliers for this product? Can MED be competitive? Who are MED competitors in this project?

Once the checking step is done there are two options for the project manager to choose from. Firstly if the result is negative MED will not continue the project. Secondly if positive, the project manager will decide to continue going into the next step: prepare the contract and offer it to the customer.

The contracting step

This step is important for MED, ensuring the success of the company in doing one project. The substance of the contract includes all commercial and technical information about the product as well as the added value activities that MED provides to the customer. In this step four main actors of MED, the logistic, finance and project managers must co-ordinate with each other to ensure the success of project.

The contracting step is initiated by the work of sale expert and engineer in the project department. The task of the expert and engineer here is creating a technical design and commercial information on the customer's product. In technical design they are responsible for choosing machinery from suppliers; deciding what machinery can be installed with others and how to do that? Which supplier can provide the machinery that is most suitable for the customer? What are the technical characteristics of the product? The commercial information includes the price of components that need to be installed, in the customer is product, and the total price of complete product.

Information about product and supplier from the sales expert and the engineer in the project management department will be sent to the financial and logistic departments. From their position, individuals working in the logistic department will find solutions for transporting the products from suppliers to customers and calculate the cost of transportation. The information about the cost of transportation will be sent to financial department.

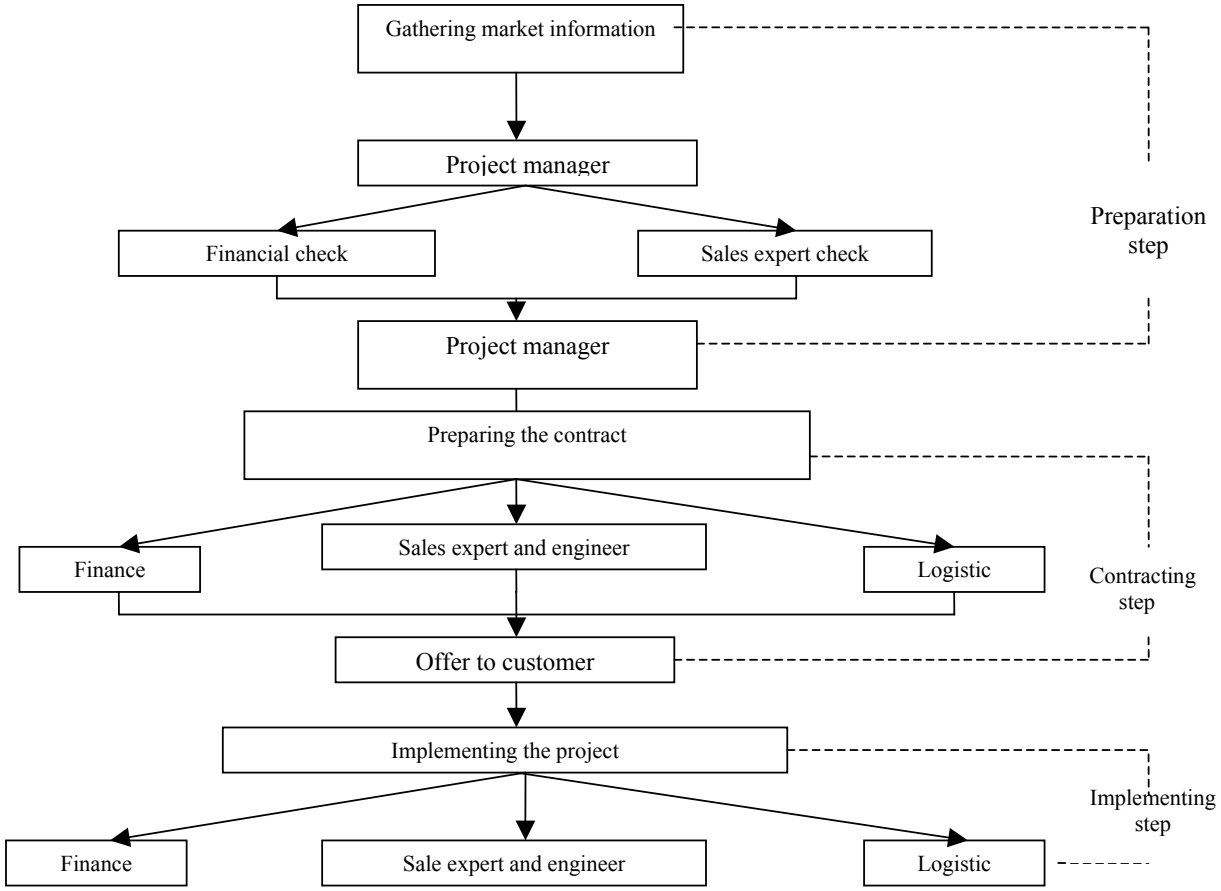

Figure 6: General process in dealing with one project in MED

All financial information from the sales expert and the engineer in the project management department and logistic department will be processed in the financial department to create a total price for the customer including the price of the product, transportation, payment term, guarantee and insurance. The project manager is responsible for summarizing all financial and technical information into contract and sending this to the customer for negotiating and signing. Once the contract is signed, MED go into the implementation step.

The implementation step

The purpose of this step is to ensure all the items in the contract between MED, the customer and the supplier are done correctly and sufficiently. The financial department checks and facilitates the payment process between MED and suppliers as well as between

MED and the customer. The logistics department is responsible for checking the product is delivered to customer without any mistakes. The role of the sales expert and engineer is advising, providing the manuals for the customer, guiding the customer on how to use and work efficiently with the product. They also have responsibility for checking that the technical perspective of machinery is good, ensuring the quality of the product for customers. If there is a problem with the product that sales expert and engineers of MED cannot solve and deal with, MED is responsible for contacting suppliers to find the solutions for the customer.

The structure step by step of how a project is done in MED; the position of departments and the relationship between them in doing one project is shown by model above (figure 6). Generally speaking the success of one project depends on the collaboration between departments, individuals within MED as well between MED with the customer and the supplier.

3.2.2 The creation and use of knowledge in one project

The purpose of this section is to introduce what and how knowledge is created and used in a project of MED. I will use SECI model of Nonaka & Takeuchi (1995) as a framework for my analysis about the process of creating and using knowledge in MED.

The preparation step:

Three channels to create market knowledge

Working in the fast moving new economy, organizations suffer from several uncertainties. One of the uncertainties here is organizations unaware of the volatility outside the firm, the changes in consumer's preference, the external technological change, and also from endogenous change due to the firm's internal or collaborative research and development activities. Organizations usually face this uncertainty when it has a problem in acquiring information (Beckley & Carter, 1999). When introducing their product and service to a new market the lack of information about this market often makes organizations fail. To reduce this uncertainty and get competitive position organizations should have a close relationship with the market in which it is operating. This relationship helps organizations have up-to-date information about the demands of the customer, the changing market, the working and

business environment (regulations, taxes, political situation…), know-how to work in this market and the potential in developing a new product. Organizations need to have in-dept knowledge about the market in which it is operating. Market knowledge in MED, as the project manager stated, is mainly created through three main channels:

- *The first from the subsidiaries and representatives in local markets all around the world*
- *The second from the brand of Elof Hansson trading house*
- *The third from the mess media*

The first channel: with the world wide establishment of subsidiary and representative MED can gather up-to-date knowledge about the local market. Working in subsidiary and representative, local people with their own experience and understanding about the market have easy contact with MED headquarter if they have information about the customer, the changing environment of the local market…Local people also provide MED knowledge about the culture, and know-how to work in the local market, knowledge about the competitors, and the person who MED can work with. This knowledge is mainly created through the social relations of the local people in their everyday get into touch with the local market. This knowledge is tacit knowledge including knowing who is the MED customer. Who is the MED competitor in market? With whom MED can work with? How do you work with the local customer? To be useful for MED this knowledge should be transferred to MED by frequent contact between local and head offices.

The second channel: As a trading house working more than one hundred years in the international market, Elof Hansson is a brand for customers and suppliers considered as a *good to deal* with company. Customers and suppliers trust and establish close relations with Elof Hansson. Market knowledge that comes from the relationship between Elof Hansson, suppliers and customers is created through rich and constant communication between them.

The third channel: from gathering up-to-date information on the internet, newspaper, and other publications people in MED can find out the demands of the customer, the needed information about the market and the product that serves to start one project.

The market knowledge creation process through the three above channels often happens at the individual level. In the first and the second channel, market knowledge is created mainly through every day working time when people with their social relations and activity come

into contact with the customer or market and create a new idea about the product and demands of the customer. The process of creating market knowledge by this way as mentioned in SECI model can be seen as a *socialization* process. In the third channel market knowledge is created through the process in which people choose and use the relevant explicit information and knowledge to create their own knowledge about the market, the *internalization* process. From SECI model we can see that the result of internalization and socialization knowledge creation process is tacit knowledge so the market knowledge that is gathered through three channels exists mainly in the form of tacit knowledge such as social relation, experience. To be useful this knowledge has to be transferred and used by the organization not by the individual. In the theory section I stated that there are two ways of using and sharing tacit knowledge. First, keep it in the tacit form and transfer it directly from one to another by meeting face to face or telephone contact *(socialization)*. Second, transfer it into explicit forms like documents, or databases that can be easy to use *(externalization)*. MED often uses the second way when using the market knowledge. All the market knowledge about the customer including customer's financial information, the demand for products, regulations for working with the customer are sent to MED in the form of a document or report to process and use.

Checking the market knowledge

Once MED head office and the project manager receive the information and report from the local market about the customer and product, they send the financial information about the customer to the financial department to check and ensure the capacity of customer and the risk when carrying out the project. The mission of the financial department here is to create a report showing that the financial situation of the customer is positive or negative to deal with. To create this report the financial department has to acquire the inflow knowledge from outside, in this case the inflow knowledge is a balance sheet, a financial report, financial laws and practices in the market of the customer. The inflow of knowledge here is explicit knowledge. When receiving the knowledge about the customer, the individual in the financial department needs to absorb this and translate it into his/her own understanding. This process is *internalization*. After having an overview about the financial situation of customer, the individual in the financial department with his/her own knowledge will point out what items in the report should be checked, *externalization*. Using the financial method to analyze these above items, individuals can create a report showing that the financial

situation of customer is positive or negative. The process in which the individual uses the method to check the financial items and create a report about the financial potential of the customer is *combination* process. The financial information about the customer is checked and sent to the project manager. With this information the project manager will decide if the financial results are positive. The sales expert and engineer in project department start their work by checking the technical aspects of the product. When doing a project MED provides the customer a complete product that is complex and includes many components and small machines, the role of the sales expert and engineer in MED is finding a solution to choose the suitable machineries and components and installing them together.

To do this task the sales expert and engineer need to have technical knowledge about the product the customer needs. The technical knowledge about the product includes two main sources. First the technical information of separate machinery and component, this knowledge usually exists in the form of documents such as technical manuals, catalogs and introductions from suppliers. This knowledge is explicit, we can define it is *know what*. The second source of technical knowledge here is the know how to install components and machinery together. This knowledge is tacit*, know- how.*

With their technical knowledge, the sales expert and engineer work together to design a new complete product for the customer. There are three steps of knowledge creation that happen here. The first is when the sales expert and engineer work together they discuss and change their experience *"know-how"* about the components that need to be installed together *(socialization)*. The second after the discussion, the sales expert and engineer use their understanding to decide what machineries should be put together and how to do that *(externalization)*. The third, experts and engineers use the technical information of separate components to compare and choose the best solution for the customer *(combination)*. After having a technical design for the product, the sales expert and engineer know what machinery can be installed with others to provide the customer with the complete product. They create a report and send it to the project manager to decide whether this kind of technical aspect is something that MED can compete with other competitors for or not. The decision of the project manager depends on the information about the competitor, the experience and the knowledge about the market of this product. When the decision is positive MED continues by going into the next step, the contracting step.

Contracting step

From the technical design of product in checking step the experts and engineers in the project management department continue to work with the commercial perspective of product. Using the register of supplier database MED can have information about the suppliers and their machineries that are needed to install the product for the customer. The project manager chooses suppliers whose products can meet the technical demands of MED's design and offer them the price for the machinery. Using the price of suppliers combining with technical design of complete product, MED can calculate the total price for the product. In other words, to have a total price for the product the sales expert and engineer in MED combines the two types of explicit knowledge, technical design of product and the price of each separate component or machinery. This process is a *combination*. The total price of product will be sent to the financial department to process. The logistic department is responsible for calculating the cost of transportation from suppliers to the customer. The employee working in the logistic department uses his own experience to choose and point out which transportation provider is good for the project, *externalization.* Using the methods of calculating cost of transportation and the database of transport providers the employee can create a final price of transportation from suppliers for the customer. This process is *combination*. The price of transportation is sent to the financial department. The information inflow of the financial department in this step includes: the cost of transportation, the cost of product, terms of payment with supplier and customer, terms of guarantee. All this information is explicit and exists under the form of documents and reports. In this step the financial department has three main tasks to do: first establishing risk and signing the contract with the insurance company, second arranging the term of payment for the customer and the third creating the total price for customer.

In the first work, because there is a difference between the term of payment of the customer and the suppliers, when dealing with the customer and suppliers MED has to handle the risk of the payment. The purpose of this work is establishing the risk for MED when dealing with the customer and supplier.

From information about the payment term, financial potential of both the customer and the supplier, the individual in the financial department translates it into his/her own understanding and context, *internalization.* He/she discuss his/her understanding with colleagues and the expert in the financial department in order to have a more clearly view point about the risk that MED will face in this particular case, *socialization*. Using their own experience and understanding about the problem, the individual points out the items or matters those need to be considered to calculate risk, *externalization*. The final step in this

work is the employee in the financial department uses the method of establishing risk to translate the risk that MED faces into the explicit form of risk establish report, *combination*.

To reduce risk when dealing with the customer and supplier, the financial department has to sign a contract with an insurance company to handle this risk. Knowing which insurance company can handle the risk and knowing how to work with this company is depends on the experience of the individual working in the financial department. As a respondent stated that my experience usually comes from the social relationship and in a period of time cooperation with these companies. Using his/her own experience in working with the insurance company *(tacit knowledge)* the individual in the financial department works and creates a contract with this company *(explicit knowledge)*, *externalization*. From the insurance contract the price that MED has to pay to the insurance company can be added to the price that the customer has to pay for MED's service.

In the case of if customer wants MED arrange the payment for it. The employee in the financial department with their experiences and relationship with financial institutions and banks can help the customer borrow money and arrange payment. Like the insurance contracting process, people use the *externalization* process to provide added value activity, payment arrangement, for the customer. The cost of this activity will be added to the contract with the customer.

The final work in the financial department is people using methods to summarize all prices (the transportation cost from the logistic department; the price that MED has to pay for the suppliers from the experts in the project management department; the insurance cost from financial department, the payment arranging cost) to a total price they offer to the customer. This work is a process of *combination*.

The final work in the contracting step is creating a contract. This work is done by the project manager. With his knowledge the project manager connects all commercial information that MED offers to the customer from the financial department, the technical design of product from the experts and engineer to write down a contract, a *combination* process.

The implementation step

When the contract between MED, customer and suppliers is signed the project management department is responsible for ensuring all the items of the contract are done correctly and sufficiently.

In order to do this work the project manager has to establish a channel of communication in which MED can directly contact with both the customer and suppliers.

Step	Content	Actor	Knowledge inflow	Knowledge conversion process	Knowledge outflow
Preparation	Gather market knowledge	Individual in subsidiary, representative and head office	Tacit	Socialization and Externalization	Explicit
			Explicit	Internalization and externalization	Explicit
	Checking market knowledge	Financial department	Explicit	Internalization-Externalization-Combination	Explicit
		Sale experts and engineers	Tacit	Socialization – Externalization	Explicit
			Explicit	Combination	Explicit
Contracting	Choosing suppliers	Sale experts and engineers	Explicit	Combination	Explicit
	Calculating the transportation cost	Logistic department	Tacit	Externalization - Combination	Explicit
	Establishing financial risk	Financial department	Explicit	Internalization – Socialization – Externalization - Combination	Explicit
	Signing the insurance contract	Financial department	Tacit	Externalization	Explicit
	Arranging the payment process for customer	Financial department	Tacit	Externalization	Explicit
	Calculating the total price	Financial department	Explicit	Combination	Explicit
	Compiling the contract	Project manager	Explicit	Combination	Explicit
Implementation	Ensuring the items of contract is done	Project management department	Explicit	Combination	Explicit

Table 2: Knowledge creation process in on project of MED

All information connecting to the process of carrying out the project will be sent to the project coordinator. The role of the project coordinator is combining information between parties in the project, summarizing that and sending it to the project manager to make a decision.

Information transferred between the project manager, coordinator, logistic department, and financial department exists under explicit form and the process of checking information about the project is a *combination* process. The process in which MED creates knowledge during one project can be summarized by the *table 2* above. From this table we can see the structure in each step of completing a project, how the organization, department and individual create and use knowledge to carry out the goals, steps and final result of the project. Now I will go into detail to discuss how MED uses knowledge during the time of working on a project.

3.2.3 Using and sharing tacit knowledge

As already pointed out, the basis of organizational knowledge creation is the tacit knowledge held by the individual. The tacit knowledge in MED exists on the form of practical experience and is created through the way day by day an individual faces problems and solves them. The experience of the individual in facing and solving the problem is particular-case or subjective knowledge. In the operation of one project when people within MED create knowledge to solve everyday problems they use tacit knowledge through two main ways. Firstly people use tacit knowledge to translate a problem into a "what" questions which establish a language or code with a universal meaning and that makes it possible to establish communication within the organization. This process can be seen with people working and preparing the market report, pointing out the items that need to be checked in the financial report, choosing machines from suppliers. Secondly, the individual decides what tools or ways to transmit what he/she wants to do, guides the action. This process happens when people use their knowledge of methods when calculating cost of transportation, risk estimate …Tacit knowledge holds the key role in guiding people's work. But to be useful for the organization the individual's tacit knowledge should be shared and used by other members within the organization. As I introduced in the theory part, the sharing of knowledge between people is not an easy process and needs both the

encouragement of organization and the awareness of people. How does MED facilitate people sharing their knowledge?

From the beginning of the project some people from the financial department, the logistic department, engineers and sales expert were chosen to take part in one project together, making them project members. Depending on their position members have different tasks to work on and they have to ensure their work is done sufficiently. To accomplish their task all members in the project must work together as a team. The working as a team in MED can be defined by the concept of team work culture. Having a close relationship with others in project, members feel free to ask for help and to share their knowledge with each other. People are comfortable in working together sharing knowledge; create knowledge to solve the problem they faced. In an interview with Erik, a new comer in MED, about the working environment in one project he said:

> "*In project time, me (in position as project coordinator) and Andersson (is responsible in the financial area) work close together and whenever I have a question connecting to the financial field I can meet him to ask and discuss it with him, he is always kind in helping me with his knowledge. I learn a lot from him"*.

Besides working in a team culture, MED also has the bonus system to facilitate people working with each other on the project. As project manager stated that

> "*If the result of one project is good 20% of income from the project will be returned to project members. Each member will have his/her own bonus that depends on his/her responsibilities and contributions"*.

To me facilitating people sharing their knowledge using a reward system is not easy to do because the organization itself may not measure the knowledge contribution of each individual when doing a project. The only thing the organization can measure is the result of individual's responsibilities. The reward system here in MED is only enough to facilitate people gathering knowledge from others and create knowledge to implement their responsibilities because responsibilities are something people *must do*. My notion here is that the reward system depending on the result of responsibilities and contribution is not enough to ensure people share their knowledge to help others. The reasons for this are people can be selfish, they don't have time to help people or maybe they don't like their colleagues and don't want to work with them. For me this phenomenon relates to the culture the organization and the personal relations between the individual and others within organization. To overcome the problem managers themselves may pay attention to building up a strong cooperative culture that helps people have good relations with each other and be

aware of the benefit in sharing knowledge with each other. Besides that the organization may use a knowledge contribution report to show in one project what kind of knowledge is important for the organization success and who contributes this knowledge. Depending on this report the organization can have a reward for the knowledge contribution of the people that facilitate people sharing their knowledge. The report of knowledge contribution is connected to the knowledge gap that I will introduce in the next chapter.

By using the reward system, the responsibility taking and the team work culture in MED makes members work close together in a team. They realize the benefit of sharing and gathering knowledge with colleagues and in their working time people always ready to share, receive, and create knowledge from their work.

In the theory section I stated that there are two ways of sharing and using tacit knowledge. The first, tacit knowledge can be directly transferred from one individual to another by face to face communication. The second, tacit knowledge can be used by the way people codify and translate their tacit knowledge into an explicit form that can be easily used by others. In a short term operation in one project from MED the tacit knowledge of people is used only the first way not the second, because as a respondent in MED stated

> "*It takes time and it is maybe not efficient when you only read and learn from books and documents, the flexible working of our company makes people learn and gather knowledge directly from the real life situation and work, learning by doing*"

When a member of a project is carrying out his/her tasks, he/she faces problems and needs to use his/her own knowledge and the knowledge that he learned from other colleagues. Receiving knowledge from others, members make abstractions and analogies between problems and using past experiences and skills to solve new problems (Zhu et al, 1997). New knowledge is created through this process guiding member actions to solve problems. Knowledge in this case, usually has a subjective, *context-dependent* and tacit characteristic. This knowledge exists *in the head of member*. One important notion here is mistakes get repeated, but smart decisions don't (Kleiner & Roth, 1998). The smart decisions that Kleiner & Roth refer to here is the new knowledge and skills that people use when facing and solving problems. If organization and individual cannot record, define and save the *smart decisions* that they use to solve a specific problem in the past, they cannot use them in future. As far as we are concerned it is difficult for people to express and define their knowledge when they face and solve problems because the context dependent and subjective characteristics of this knowledge. To do that people have to understand the context in which a problem appears and how step by step they solve this problem, and why

they did that. I think the process in which people express their knowledge when solving problems should take place in everyday working time whenever a member faces a problem and solves it. In my interview with a member from the financial department about her work in one project, she mentioned that

> "*I wrote down in my personal notebook all my understanding from the beginning and step by step I took to solve problems that I faced when working on a project. When writing down all this information I can learn from this whenever I face a problem that is similar to the past one"*

The process this member mentioned above as the SECI model mentioned is externalization process, making tacit knowledge explicit in the form of document. From my point of view the using of a personal notebook to write down the experience that individual learnt from her working is good not only for the individual herself but also because this experience and knowledge can be shared with others. It will help others who want to find the solution to a problem with the same characteristics as past one. The member in the financial department also said:

"*For me writing down my experience and skills during work is good and I do it for myself but my colleagues don't. And my personal notebook is only used by myself"*.

As introduced before, the process of doing a project in MED is so complex and there are many tasks and subjects as well as problems for members that there is a great amount of knowledge *in the head of* members who take part in this project. Some respondents from MED stated that

> *"In one project there are many people from inside and outside of MED taking part in this project. Some people may work for MED for a short period"*

My question here is that if some members of one project give up their job, taking their knowledge with them, how can MED know about this knowledge? Here by I state that if MED cannot define the knowledge of its members and store this knowledge in its organizational knowledge base, it may loose this knowledge when these members go out or for a period of time they don't use this knowledge and forget it. I think the storing tacit knowledge and experience of members during project time is necessary to do in MED.

3.2.4 Using and sharing explicit knowledge

From the chapter definition of knowledge we can see that explicit knowledge in MED exists in the form of documents such as regulations, financial reports, the market reports, technical

information about products, documents and working file from one project. The documents and information are created day by day as people work and gather from their practicing and working. I call the information, document and database within an organization the information base. For me there are two levels of information base, the organizational and individual. From my model of individual and organizational knowledge (figure 5) I see that the organizational information base is created through the collection and sharing of individual information and the more information individuals share the more they develop the organizational information base. By observing people from MED work I found out that each individual has his/her own *"information base"* connecting to his/her specialized knowledge as well as the information needed to work. This *"information base"* is organized and structured by the individual himself/herself. From my point of view the way of structuring and organizing this *"information base"* depends on the way the individual works and his/her personal knowledge. Generally speaking, the individual uses his/her tacit knowledge (personal knowledge, skill) to structure and organize the information base that is explicit knowledge. Because personal knowledge and skill differs from one individual to another I think the way of structuring and organizing information is different from individual to individual. In everyday working time, when needs knowledge from the "*information base"* the individual uses his/her structured and organized skill to find it. When I asked an employee from MED to help me gather a document connecting to his work, firstly he had to remember and structure information about the position where he put this document and after a period of time he could find it for me. Taking a position as an employee in MED, wanting to gather existing information, document (*explicit knowledge*), I cannot do it without the help of the individual who himself organized and structured that information. In addition I do not know what kind of information others within the organization have. From this view point I think the transfer of explicit knowledge in MED is not sufficient if the organizational information base is divided into many *individual parts* and people in the organization don't know what they can gather from using this base.

Using IT and the internet in transferring and processing explicit knowledge in MED

Following the development of internet and other IT instruments organizations now can gather and process information from the market faster and more efficiently. As noted before that information is not knowledge. When receiving information an individual and an organization use knowledge to translate it into their own understanding and create new

knowledge that guides them in action. If the individual and organization cannot use their knowledge to translate information into action, the more information they receive the more the problem of *information overload* they suffer. Looking back to the process of doing one project in MED *(table 2)*, from the beginning when gathering market knowledge to the end of a project, the knowledge outflow of each step is explicit knowledge. To speed up the process of transferring knowledge within the organization as a respondent said:

> "*MED has two ways of communicating in one project. The first; each member of the project has an email account to directly contact others when needed. The second MED creates a public email address that all the partners on the project can access, sending information connecting to project and opening it to gather information"*

The *i*nternet in this way helps the process of transferring information and knowledge between members within MED faster and more efficiently. One notion here is that by using the internet and IT instruments, MED can transfer information and knowledge efficiently. However how MED uses them to process information and create knowledge is far more important than only transfer knowledge. How do IT and the internet help MED process and use information and knowledge? When asking some respondents about the IT system and database in MED, I received various viewpoints from them. People didn't clearly see and realize what the database in MED is. One respondent stated:

> "*We do not have any database about suppliers that includes the information about the products of suppliers, the price of the product, the technical characteristics of products… We only have a register of suppliers that we have been working with in the past, but that does not include prices. We choose suppliers from case to case and discuss how we should work on every individual project"*

Because MED has no database on suppliers for finding suppliers for customers, only the expert and manager with their experience and relations with suppliers know about supplier and product. As a respondent mentioned:

> *"Knowledge about suppliers and their products exist in the experience of sales expert and managers"*

Another respondent in MED stated:

> "*MED has more than one hundred suppliers all around the world. Knowledge about the suppliers and their products is so important for MED. This knowledge is updated by daily contact between MED and suppliers"*

For me to process information about more than one hundred suppliers and daily update with their products is very difficult, not to say inefficient without the support of an IT system.

From my observation, in MED almost all information about the suppliers is stored in documents and catalogues in the project department. If members of the project need information about the suppliers they have to gather it from documents and catalogues. As I mentioned above, the explicit knowledge in the form of documents and files in MED is structured and organized by the individual so it is not easy for a member to gather this knowledge if he/she is not the person who structured and organized it. This work can be done more effectively if MED has an information base system in the form of database. Instead of gathering information in documents, members of MED can use IT system, e.g. search engine, to do this faster and more efficiently. The process of using IT in searching and processing information helps facilitate the knowledge creation process in MED.

3.2.5 Summary

We can view knowledge as a resource of MED and the process of doing one project as a process of using and creating knowledge. From the beginning of the project MED has to gather knowledge from outside (customer, market). The knowledge from outside is the inflow knowledge for MED to process. MED uses its own knowledge to process the inflow knowledge and create new knowledge to provide to the customer. The complete package of the product (including products and added value activities of MED) that MED provides to customer is a result of knowledge processing in MED.

On the other hand, if we can consider the operation of MED as a network of interacting partners, individual and department. The interacting partners depend on each other and have to co-operate and their activities need to be coordinated in order to carry out an overall goal or objective (Hellgren& Stjernberg, 1987). The dependent-relationship between individuals and departments in MED is created through the process in which they co-operate doing the tasks, in changing, sharing and creating knowledge. Once a step starts, knowledge inflow is material for a department in MED to process. This department processes this knowledge by the way of individuals using their own knowledge, coordinating with others in the department to create the knowledge outflow. The knowledge outflow that is created in one department is a knowledge inflow for others to process and use. The knowledge creating using and sharing in MED is a process continually happening, between individual and department and finally to overall organization level. The final outflow knowledge is the knowledge that MED provides to the customer. By analyzing the process of creating and using knowledge in MED from the process completing one project I found out that in

everyday working when experiencing problems people use and create knowledge to solve them automatically and subjectively. People mainly pay attention to the result of action not to defining their knowledge and the structure in which their knowledge is created and used. This phenomenon makes it difficult for organizations and individuals to develop their knowledge for future work or in a long term strategy.

4 - Knowledge management strategy

In this chapter I will introduce theories connecting to the way organizations manage knowledge. In the case study I will suggest tools that organizations may use to manage their knowledge.

4.1 Theory in knowledge management

Considering knowledge is the resource of an organization in the new economy, managers are now placing great attention on understanding what and how to manage knowledge within their organization. When the organization and manager have decided to embrace the concept of knowledge and how to manage it better, they often do not know where and how to start. Therefore

> *"There is a need for models frameworks that helps managers both to understand the types of knowledge management initiatives or investment that are possible and to identify those that make sense in their context* (Earl, 2001)

Creating a knowledge management strategy framework for an organization is a pressing and necessary requirement for managers. Similar to a management process the knowledge management strategy making process should follow natural and logical steps. The most important step for an organization building their knowledge management strategy is to define the focus of this strategy, knowledge. In order to manage knowledge efficiently an organization should answer the following questions: What kind of knowledge should be developed? What are the characteristics of the knowledge? How can this kind of knowledge be developed?

4.1.1 Defining knowledge and creating a knowledge map

One of the most important tasks when building a knowledge management strategy for an organization is defining and realizing the knowledge of the organization and the individuals. People usually do not know about their knowledge therefore, nor does the organization. To solve this problem in knowledge management the organization and manager may use a tool to record and disclose who in organization knows what by creating knowledge map or knowledge directories (Earl, 2001).

The development of knowledge comes from the daily activities of organization and individual facing and solving problems so the knowledge strategy formulation and choice needs to be tightly coupled with other strategizing activities within the organization (Krogh et al, 2001). In detail, to define their knowledge, organizations should connect their knowledge with business strategy and operation. An organization's strategic context helps to identify knowledge management initiatives that support its purpose or mission and strengthen its competitive position. Zack (1999) suggests in order to define knowledge organizations should use the SWOT (Strength, Weakness, Opportunity and Threaten) frame in analyzing the work of the organization both at present and in the future. From the SWOT framework organizations know the strengths and weaknesses that can be interpreted through content of what the organization can do; opportunities and threats dictate what it must do. The difference in what organizations must do and what they can do is strategic gap. By using the strategic gap connecting the content of what the firm can do at present and must do in future with perspective about knowledge, the organization would know what knowledge the organization at present have and must have in future work. The difference in what organization must know and what it knows is the knowledge gap.

The relationship between the knowledge gap and the strategic gap is shown by this model:

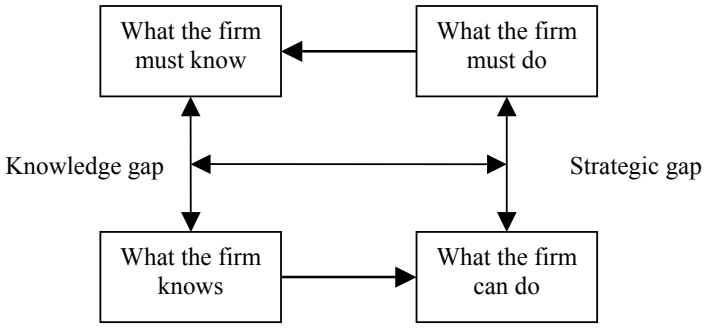

Figure 7: Organizational knowledge gap and strategic gap relation (Source Zack, 1999)

From this model, we can define what knowledge organizations need to create and use to carry out the business strategy. From my point of view using the model by Zack is not enough for an organization to define its knowledge because there is a chaos between knowledge creation and business strategy. Knowledge creation is an inherently bottom-up process while management practices are of top-down nature (Klint & Verhoef, 2002). As I

have mentioned there are two levels of knowledge in an organization: the individual and the organizational. Organizational knowledge is created and developed through the process of sharing, using and creating individual knowledge. The development of individual knowledge is the source for the development of organizational knowledge. Therefore defining the knowledge of the organization through connecting knowledge with strategy using model by Zack (1999) is only defining knowledge from an organizational level not from the individual level. This is not enough.

In order to define the knowledge of an organization, from my point of view, we should concentrate on defining knowledge from the low level to high level and from individual knowledge to organizational knowledge. Using the model of Zack (1999) as the framework, I suggest a model *(figure 8)* to define knowledge from both the individual and the organizational level.

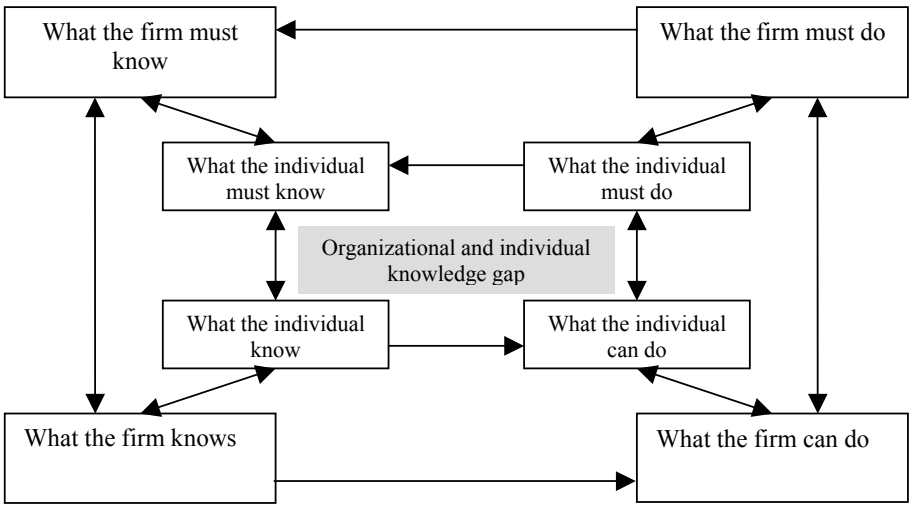

Figure 8: Individual and organizational knowledge gap

From strategic evaluation of knowledge-based resource and capability showed in this model, we can define from both organizational and individual level what knowledge the organization and individual have at present and what knowledge they need to develop and acquire for future work or long term strategy. From everyday work and describing their knowledge by using the knowledge gap, individuals and organizations gradually create a knowledge map or directory of knowledge. From using this knowledge map, the organization and individual as well not only know about their knowledge but also know how this knowledge can be created. Where can they gather the needed knowledge? From the

definition of knowledge organization we can go a step further in building a knowledge management strategy.

4.1.2 Defining the existence of knowledge

From using the knowledge gap, the organization has a picture of what knowledge they should focus on at present and what knowledge they should create for the future work. I call this knowledge is core knowledge. Knowledge as mentioned above includes both tacit and explicit dimensions and resides in specialized forms among individuals and organizations. Each type of knowledge has its own characteristics. Hence, in order to manage their core knowledge, an organization should investigate in what form the core knowledge is exists in. Explicit knowledge is information that exists in a database, information systems, and documents that are easy for individuals and organizations to manage and use. Because of the easy-to-transfer-and-use characteristic, explicit knowledge can be easily transferred from outside in and from inside out of an organization. If core knowledge is in the hand of a competitor, they may act upon it for the competitive position of the organization. Organizations should pay attention to protecting the explicit dimension of knowledge when building a business strategy.

Tacit knowledge exists *in the head of individuals* and is difficult to share and utilize with full meaning. Tacit knowledge is an important source for creating new knowledge (Nonaka & Takeuchi, 1995). Consequently, in order to effectively manage their tacit knowledge when making their knowledge management strategy, organizations should emphasize both building the facilitative condition for knowledge creation process, for example creating channels of sharing experience, communities of practice, and codifying experience and expertise for others to access using their own judgment (Earl, 2001)

4.1.3 Knowledge management strategy direction

In my view, the essence of organization in knowledge management perspective is to use knowledge to guide action and translate it into value. Depending on the characteristics of the industry where the organization operates as well as the knowledge organization they have, there are many aspects in building a knowledge management strategy. From these two above steps in building knowledge management strategy we can define the core knowledge

that the organization should focus on and develop as well as the existence of this knowledge. In this step, I will introduce the directions guiding the organization on how to manage their knowledge, a basic step of creating a knowledge strategy. In managing knowledge, according to Bloodgood (2001), we have three general strategies: knowledge creation, knowledge transfer and knowledge protection. The knowledge creation strategy focuses on creating new knowledge that can be used to develop new products and services. The knowledge transfer strategy focuses on rapidly disseminating knowledge through an organization in an effort to utilize it to its fullest extent as quickly as possible. The knowledge protection focuses on codifying and tacit-less knowledge that protects knowledge from being copied and used by competitors. Each of the three strategies above have their own advantage and disadvantage. The advantage of knowledge creation strategy is that it can create new knowledge for developing new products and services. The disadvantage of this strategy is that knowledge creation often involves a high level of explicit and tacit knowledge. The competitive advantage derived from knowledge creation may not be used to its fullest potential, and it may not provide a lasting advantage when insufficient effort is expended to make the knowledge useable within the firm and to protect the knowledge from transmittal to competitors outside the firm. One more disadvantage of this strategy the cost investing in creating new knowledge is high, and the organization is uncertain and can't measure the return on investment. Knowledge transfer, on the other hand, may lead to advantage through speedier deployment of knowledge to portions of the organization that can benefit most by it. The disadvantage of this strategy competitive advantage is that it may not be sustainable because knowledge that is easily transferable within the firm is more likely to be transferable outside the firm to the competitors as well. Knowledge protection can lead to products and services that are difficult to imitate, because competitors cannot figure out how to compete with an equivalent product. However, this strategy at times keeps knowledge under tight wraps, which unknowingly prevents its transfer to areas of the organization that could benefit.

In choosing a knowledge management strategy it is important for an organization to realize which knowledge it should focus on under various circumstances. From this point of view, to effectively manage knowledge an organization has to decide which knowledge should be created, which knowledge should be transferred and protected. In addition, from my discussion about knowledge, we know that knowledge exists in the form of explicit and tacit

at both the individual and organizational level. The difference in the forms of existence as well as the level of knowledge in organizations leads to the difference in knowledge management strategy. In detail, if knowledge almost exists in the explicit dimension, organizations should focus on the protection and transfer strategy. On the other hand if knowledge is tacit, organizations should focus on the transfer strategy. From the three steps in building a knowledge management strategy I can summarize them below. I call this the tree of knowledge management strategy.

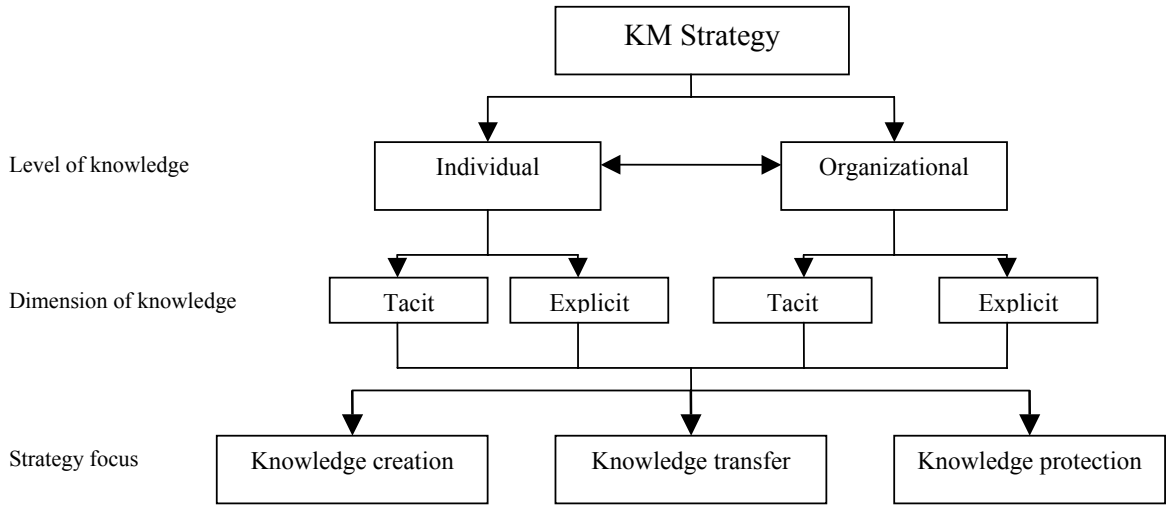

Figure 9: The direction to knowledge management strategy

I think the tree of knowledge management strategy is a framework for organizations to work out their strategy. From the beginning to the final step of the knowledge management strategy I emphasize that the step of defining organizational core knowledge is the most important one.

4.1.4 Summary

In this section I introduced the theory perspective of knowledge management strategy. For me the most difficult task for organizations when making a knowledge management strategy is they don't know how to clearly define what knowledge is important to develop, where this knowledge exists in an organization and how to create and use it. Creating a knowledge gap helps organizations define their knowledge in connection to everyday when individuals and organizations face problems using knowledge, coordinating with others, creating new knowledge and solving problems. From the definition of knowledge, organizations can

choose a direction to their knowledge management strategy. If knowledge exists in the tacit form, organizations can choose the strategy of knowledge creating and transferring. On the other hand if knowledge exists in the explicit form, organizations can choose the strategy of knowledge transferring and protecting.

4.2 Knowledge management in Elof Hansson

From analyzing the knowledge creation and use in its short term operation of one project I can define that the important knowledge of MED exists mainly in the experience of people. The explicit knowledge exists in form of documents. Knowledge management strategy of MED should focus on continuously creating and transferring and the tacit knowledge of experts as well as facilitating the process of transferring explicit within the organization.

4.2.1 The long term and short term view

In my interviews almost all respondents from sales experts, assistants as well as managers stated that MED had a short term rather than long term focus. Why MED had a short term focus as some respondents explained was

> "*Because the short term is necessary and helps MED stay flexible with the changing market and business environment"*

For me the short term focus may damage organization's ability to see the benefit of using knowledge and new technology to innovate and compete. The question for managers here is not how the organization operates in the short term but how organization develops in their long term strategy. Some respondents mentioned,

> *"Long term of MED as well as Elof Hansson is a strong brand name of the organization for the future development in world wide market"*

But what makes Elof Hansson as well as MED have a strong brand name for more than one hundred of years working in international market? As respondents from Elof Hansson stated that

> *"The experience in international trading and knowledge in providing added value activities are the main reasons why Elof Hansson competes in long term strategy".*

Being flexible with the changing of the business environment in short term and continually innovating in long term strategy are not separate but dependent tasks. The knowledge and experience that people created and used in short term can benefit for the long term operation

of the organization. How does one create and use organizational knowledge in a long term strategy?

4.2.2 How knowledge can be developed

Let's return to my model in the relationship between individual knowledge and organizational knowledge *(figure2)*, organizational knowledge includes both two main sources: the internal and external knowledge source. To develop the organization's knowledge we both have to consider the internal and external knowledge development. The internal knowledge includes knowledge of individuals working in the organization, the information base system of the organization. As the MED knowledge definition part I divide the knowledge source of MED into five domains: knowledge in finance, logistics, sales expertise and engineering, market knowledge and project management knowledge. These domains of knowledge exist from the low level in individual knowledge to the higher level in department knowledge and in the overall level in MED's organizational knowledge. To develop organizational knowledge MED should develop first the internal knowledge base and second the external knowledge base.

To develop the internal knowledge base MED may focus on *developing individual knowledge*, *facilitating individuals to collaborate, share and exchange their knowledge and updating the information based knowledge system.* On the other hand, to develop the external knowledge base the MED may focus on upgrading its absorptive capacity of new knowledge and developing the channels for contact with the outside partners.

4.2.2.1 Developing the individual knowledge base

The individual has two ways of developing his/her own knowledge base: firstly, attending a training course to gather special knowledge, for example, a course in management in university, secondly, taking part in real life situations in practice to gather experience and knowledge, learning by doing.

Training program

To develop the individual knowledge base Elof Hansson has two systems for training people. The first is courses for those who have already been working for company and the second is the special trainee program for new comers.

When asking some people from Elof Hansson about the training courses I found out that there are two main difficulties making the courses in ELof Hanson insufficient. The first is that people may have not enough time to attend these courses because of their work load. The second is that they do not know what is relevant for them to study; they do not know what they need to learn for their job. These two difficulties make it difficult Elof Hansson effectively organize training courses for people. Now almost all training courses are established by the division itself not by the overall organization. Depending on the demand for working in each division, a manager decides and facilitates people attending the needed course. In general Elof Hansson educates its people mainly through learning by doing.

The special trainee program as the personal director of Elof Hansson stated:

> "*Elof Hansson regards a trainee as a resource, depending on the demand of each division in Elof Hansson they can be educated by a different program*"

In general as a trainee individual is learning how to manage international business, he or she also has the opportunity to influence the organization with up-to-date knowledge straight from university. The purpose of the trainee program is to give the new comer a comprehensive view of the Elof Hansson group before they specialize in a certain business area. From the Elof Hansson stand point, *genuine knowledge is based on practical experience,* therefore, the trainee should be involved as much as possible in the daily work.

During the two-year trainee period trainees are placed at various divisions/departments for 3-6 months, the finance and shipping departments are compulsory 'stations' for each trainee. After the training period, the trainee is supposed to have solid knowledge about the entire business process and about the company's entire organization. . In addition, one or two stays at Elof Hansson business areas are included in the program as well as a shorter period abroad at a subsidiary or an extensive business trip in foreign markets. If necessary, Elof Hansson designs individual training activities such as sales training, export and import administration, international trade, language training. From analysis of the process of completing project in MED we can see that it is a complicated process that needs the coordination of many types of knowledge, from commercial knowledge and technical knowledge to social knowledge. To work in MED, besides the knowledge in a specific area such as finance, technique, and logistic employees need to have knowledge about the process of doing business in MED as well as the relationship between the specific areas of

knowledge. According to the project manager there are three ways in training a new comer in MED:

- The first is giving the new comer a specific project and telling him to coordinate the activities. The project manager and other experts in MED will evaluate the work of the new comer and help him when he needs it*(learning by doing)*
- The second is technical training that includes organizing the in-house training program where experts are called in to speak on different aspects of a project and different technical matters pertaining to a paper mill. During this time of the training program the trainee also visits paper mills to know how to organize a factory in producing paper...*(learning by watching and observing)*
- The third is commercial training by sending the trainee to different courses pertaining to commercial activities *(learning by studying)*.

Going into detail, in first way is when MED provides a new comer a project to do. In a project in Turkmenistan the position of Erik, a new comer, is a project coordinator. His responsibility is coordinating the operation of logistics and invoicing department, financial department, technical and project manger. Because the technical characteristics of this project are complex, MED has to hire a consultant company to take care of the technical design as well as the commercial aspects of product. In the project, Erik contacts the consultant company as well as the subsidiary in India to gather the technical as well as commercial information on the product. Whenever receiving information Erik will send this information to the financial and logistic department to process. The results of the information process in the financial and logistic department will be given to Erik to send to the project manager to make the decision. From the process of working in one project Erik can gather knowledge about the technical, financial and invoicing process as well as knowledge on how to combine the three types of knowledge together to process a project in MED. Looking back to *table 2*, the knowledge outflow of each step in a project usually exist in the form of explicit knowledge. The problem here is that if the new comer only receives the explicit knowledge from experts but does not have the opportunity to work directly with it in the process of analyzing and solving problems, the learning process here is not enough because the trainer may not know about the tacit knowledge and experience of the experts. New comers can understand the solution to the problem but cannot understand and know why and how the expert solved the problem and what the *smart decision* is? The process of learning when a new comer takes part in doing a project is not enough if managers have few tools with which to capture institutional experience and disseminate its lessons (Kleiner &

Roth, 1998). One tool that helps organizations to capture the experience, knowledge and smart decisions of individuals when working is knowledge gap that I introduced in the theory part.

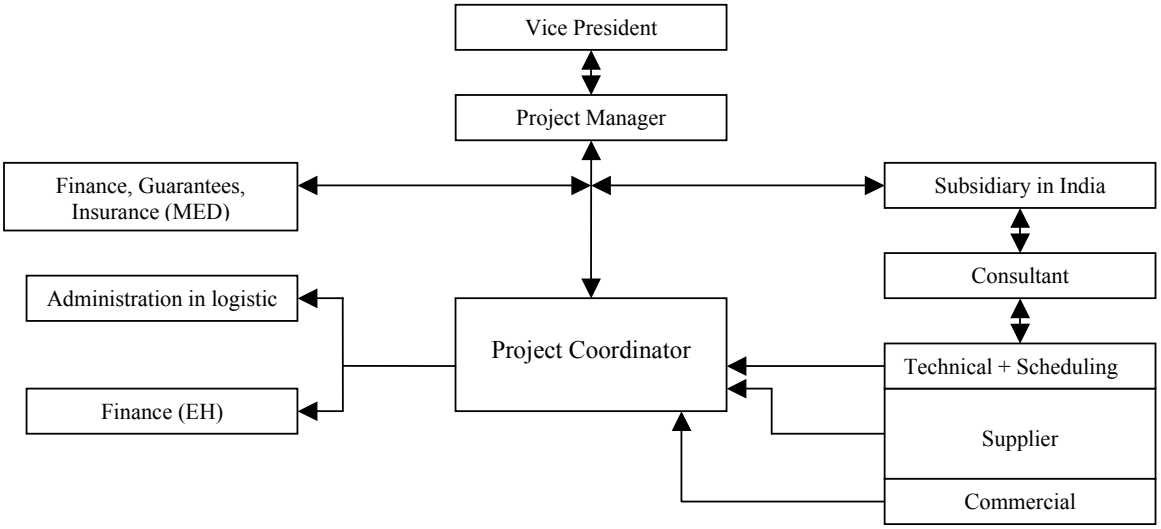

Figure 10: The relationship between members in Turkmenistan project
(Source: Turkmenistan project in MED)

By using the knowledge gap, the organization knows what knowledge is created and used during a short term operation and what knowledge makes the organization a success in the project. The organization can benefit from learning and using this knowledge for a long-term strategy. Because the view point of managers from MED is that *knowledge exists in the heads of their employees* and makes them flexible in solving problem, less attention has been paid to the storage of experience and the best solutions in documenting after projects end. To build a knowledge strategy MED may create a knowledge gap in short term of operations.

Understanding a knowledge gap

As a respondent from MED stated:

> "*People when working know how to do their work but they cannot express and realize what knowledge they use to do that"*

This problem makes it difficult for organizations to know what knowledge its members are creating and using in short term operations thus, it is difficult to have a long term development of knowledge. To define the knowledge that both organization and individual

use and create in a short term operation, I suggest that MED may use a knowledge gap as a tool.

When using a knowledge gap an organization may connect the process of individuals and the organization working on a specific project with the content of the knowledge. By asking individuals working on the project "what-question" I would like to help them to express and translate their "know-how" into "know-what" that is easy to understand and use.

From above level, the project manager should describe the following contents:

General evaluation of project: introducing the process from beginning with the requirements for the project to the end of the project with the final result.

Business solution: describing the relationship between business requirements and possible solutions i.e. under which conditions and what solutions are to be implemented and how they work in this context. This part includes descriptions of technical, commercial solutions. The technical part will describe the complexity of the product, the technical design and solutions to problems. On the other hand, the commercial solutions will describe the financial perspective of the product, the difficulties in arranging the payment, establishing risk …and offer solutions.

The lesson from project: including the most important lessons from the point of view of the project manager: definitions of successful solutions; management solutions are documented and any unresolved issues, at the end of the project.

From the overall view of process as well as solutions to carry a project, organization should go into detail to investigate how the solutions are found by each member of the project. This step is important because it makes the knowledge that members used and created during the time of working more clear. Each individual in the project should answer the following questions connecting to his/her work:

General information: Individual will answer the questions about his/her own understanding about the project as well as his/her knowledge.

- What is your position in the project?
- Do you have experience working in this kind this project? If yes what it is?
- From the beginning of the project what do you know and understanding about your work in this project?

The solutions: Individual will answer the question about the problems he/she faced when working in project and the solution he/she made.

- What is your responsibility in the project?
- What are the tasks you have to do?
- What are the problems you faced when doing these tasks?
- How do you solve these problems? Do you do it alone or coordinate with someone?

+ If you do it alone, could you explain step by step from the beginning when you faced problem, what do you think about it? Can you make sense of it? And what is the way you solve it?

+ In a case where the problems that you faced were solved by the way you worked with someone, with whom you do you work with? When facing this problem why did you work with your colleagues? From the beginning, before working with your colleagues, what did you know about the problem? What can you learn from your colleagues when working with them? After working with your colleagues what do you know about the problem and what the way did you solve this problem?

The lesson from project: Individual will describe what he/she learned from the project.

- For you what is the most important factor that makes you a success in this project?
- What can you learn from this project?
- Do you have any suggestion for future work of the company?

After receiving answers from individuals and the project report from the project manager, managers of the organization should summarize them into a knowledge report. From this report mangers can understand what knowledge individuals and organizations use and create during a project? Who knows what? Who creates what? What is new knowledge?

By creating a "knowledge gap" from a short term operation, the organization gradually defines its knowledge; the individual not only knows about his/her own existing knowledge but also knows about the knowledge of his/her colleagues. From this knowledge gap the organization knows what how to develop organizational knowledge in a long term strategy and the individual knows what he/she needs to learn from others and from attending the courses.

4.2.2.2 Facilitating the process of knowledge sharing and creating

From the barriers of knowledge sharing part, I introduced one of the factors that affects the process of sharing knowledge, which is the context dependent characteristic of knowledge. It is important to understand that a proper context should support the cycle of sharing individual tacit knowledge, documenting it, reusing it and again internalizing it at the higher

level. The difference in the top-down view point of managers and the bottom-up of knowledge creation process make both the individual and organization pay less attention to the process of knowledge creation and using. People use and create knowledge in their everyday work when facing and solving problems. However but they cannot realize and define their knowledge and how and where their knowledge is from. This phenomenon makes it difficult the organization to facilitate the knowledge sharing among individuals which means is difficult to develop a long term strategy. To solve this problem rather than a top–down managerial approach to knowledge creation, a knowledge vision should succinctly describe the relevance of knowledge creation for the organization. It should create awareness for knowledge creation at all levels and it should identify knowledge sharing as a company value. To facilitate the process of sharing knowledge between individuals within organization managers should also form a mechanism for sharing tacit knowledge. As I stated before, personal face-to-face dialogues are one of the most effective mechanisms for information and knowledge exchange. To be effective in managing the tacit knowledge sharing process, the organization should create an environment in which everyone have close relation with each other and are always ready to participate in sharing knowledge and making valuable contributions to the organization. As a respondent in MED stated,

> *"Yes of course the face to face meeting and conversation between individuals to share and create knowledge is a good way to develop knowledge within the organization. But when people meet each other maybe they don't know what to share with and what to use without the direction of a manager"*

To solve this problem, when establishing a meeting to help people share and create knowledge, manager should define explicit rules for conversational substance, intervene and direct conversations, and introduce a common language in the form of *"know-what"* to describe the ideas and concepts.

4.2.2.3 Developing the information base system in MED

As we all agree, information is not knowledge, it is only a part of knowledge. To create knowledge people have to gather information, checking it, structuring it and process it to guide action. In MED the information base exists in the form of documents and files within each department and individual. During work time, the individual searches for information from her/his own *individual information base*, uses this to create knowledge to solve

problems. As I stated before, that this *individual information base* is structured and organized by personal skill and that way of working that makes it difficult to transfer information from one individual to another and from department to department within organization. The increase in information processing capacities helps people within the organization, disseminate and integrate the best available information to process and create knowledge (Chadwick & Hanson, 2001). To facilitate the process of creating and using knowledge MED should build up an information system base with a synchronous structure. By synchronous structure I mean here is that each individual information base is structured in a general form that helps the individual within the organization know what she/he has; what she/he can gather from the information base system of organization and where she/he can gather the needed information. Also MED can use the IT instrument to create an organizational information system database. This database includes all the information of people within the organization. Entering this database people not only know what information at present organization has and who holds this information, but also can contribute daily to this information by providing more information that they gather from their working time e.g. when a person from the financial department wants information about a supplier that MED has worked with in other projects he/she can enter the information base system using the search engine instrument to search this information. Using IT to process and search for information, people can reduce working time and can be *more flexible* creating knowledge, reacting to the change of environment. One important notion here is that when building an information base and database, managers should also pay attention to protect information, especially information connecting to trade secrets. With important information only a few people should be able to access it and use this. Using IT to process information but still ensuring the protection of the information makes the organization work more efficiently.

4.2.2.4 Close relationship with the outside environment

As a trading house with more than one hundred years experience in international markets, Elof Hansson knows knowledge about the market is very important for the development of the company. By establishing subsidiaries and representative all around the world, using social relationships and everyday contact with customers, Elof Hansson can gather the up-to-date knowledge about products, markets and the changing worldwide business environment. The local market knowledge is important for long term of strategy in Elof

Hansson. When talking about the long term of using knowledge from local market, some people in Elof Hansson agreed:

> *"The local knowledge is important for the company. This knowledge usually exists in the form of experience of those people working in this market. For long term strategy the company uses those people with knowledge about how to work in the local context when starting up another project in this market".*

As a centralized organization working in a local market MED mainly pays its attention to the results of work, not to knowledge of this market. It is difficult for MED to know what kind of knowledge local people use and create to work. As a respondent stated:

> *"Sometime we feel disappointed because we don't know how they work" or "during the running of the project they have very good ideas that we have never known"*

I think to develop the organizational knowledge for a long term strategy the company should focus not only on defining knowledge (using the knowledge gap in working) from the local workforce, transferring it into organizational knowledge base but also facilitating people from the local market taking part in the process of creating knowledge within the organization e.g. facilitating them create new ideas, concepts on new products and solutions for the company.

For long term strategy Elof Hansson and MED as well should also create close relations with suppliers and other organizations to develop markets and products. As a respondent remarked:

> *"The relationship between MED and suppliers is very important. It not only provides products for customers of MED but also co-operates with MED to do some research in developing new products and markets*"

This cooperation between MED and suppliers is created through the changing knowledge between them. MED has knowledge about markets as well the capacity to contribute products to customers. On the other hand, the supplier has knowledge about technical, solutions for the product. The two parties work together to create a new product for the future demands of the customer and the market. I think that the closer the relationship in developing new products between the supplier and MED, the more value and success that MED can get in long term operation. How to co-operate with supplier in this activity is not an easy question because both parties realize that their knowledge about new products and markets is *"power and money"*. It is difficult to transfer knowledge between the two parties because the *fear of loss homogenous* phenomenon. If the supplier knows about the market and they have the capacity to develop new products for this market, *they may do it alone* not

through MED. To avoid this problem, from my point of view, in order to find new products for the future demand of customer besides the cooperation with suppliers, MED may connect other organizations such as universities, institution both from the host country and local markets to do that. MED can be more independent in developing in the future.

4.2.3 Summary

In this chapter I introduced some perspectives in building a knowledge management strategy in an organization. From the model about the relationship between the individual and organizational knowledge I stated that to develop organizational knowledge the manager should focus on developing the two types, the internal and the external knowledge base. In developing the internal knowledge base, the organization should focus on developing individual knowledge, facilitating individuals to collaborate, share and exchange their knowledge and updating the information based knowledge system. On the other hand, to develop the external knowledge base, the MED should focus on upgrading its absorptive capacity with the new knowledge and developing the channels to contact with the outside partners. What is most difficult for the both the individual and the organization in developing their knowledge is that during the working time they cannot define what knowledge at present they have and what how this kind of knowledge can develop in the future. The knowledge gap that I introduced in this chapter will help organizations and individuals define their knowledge when using and creating knowledge in their everyday working time. The clearer the definition of knowledge is the more successful the organization will be in developing a knowledge management strategy.

5- Conclusion

As a trading house Elof Hansson operates to connect customers with suppliers and provide them the added value activities. To be competitive Elof Hansson has not only specialized knowledge about the services that Elof Hansson provides to the customer and supplier but also knowledge about the product and the market in which Elof Hansson operating. Knowledge as managers of Elof Hansson stated *"is the most important source to carry out the competitive advantage"* but how the company uses and creates knowledge is still a difficult question to answer. To understand the meaning of knowledge creation and use within an organization we should pay attention to the two aspects of knowledge, individual knowledge and organizational knowledge. Organizational knowledge and individual knowledge have a close relationship with each other. In detail, the development of individual knowledge helps create the development of organizational knowledge. In return, the development of organizational knowledge helps individuals in everyday working. I set out to study the relationship between these two aspects of knowledge in the process of creating and using knowledge. In studying Elof Hansson case I divided this process into two periods of time, short term and long term. In the short term my study focused on the process by which people in MED work together in one project. The process of completing one project is so complex that it requires the use and combination of many types of knowledge e.g. social, technical, financial, logistic knowledge. People with their individual knowledge work together, sharing and creating knowledge to carry out the project. By studying the short term operation in MED I found out that there are some barriers that make it difficult for the organization to develop its knowledge in a long term strategy. One of the most significant barriers here is the awareness of the individual and the organization about the existence as well as the way their knowledge is created and used. People do not know what knowledge they have and how this knowledge is created and used. Because of this barrier in Elof Hansson less attention has been paid to storing to reusing knowledge that was created and used in short term operations. If Elof Hansson cannot store and reuse its knowledge, especially the experience of people, it will loose this knowledge if the holder of the knowledge leaves the organization or for a long period of time this knowledge is not used. In the process of studying MED I also found out that the information system base of the organization is divided and structured into individual parts. This problem makes difficult the process of transferring and changing information inside organization.

From my findings in short term operation of MED I go into detail another side of process using and creating knowledge, long term. The long term in creating and using knowledge is building a knowledge management strategy that helps organizations compete in the future. The purpose of knowledge management strategy is to develop the organizational knowledge to serve for organization strategy and operation. I built a model on the relationship between individual and organizational knowledge. From this model the organizational knowledge can be developed in four main ways:

- *Developing individual knowledge*
- *Facilitating individuals to collaborate and exchange their knowledge*
- *Developing the information based knowledge system.*
- *Developing organization's absorptive capacity with the new knowledge and the channels to relate with the outside partners*

From these aspects above connected to the Elof Hansson case, I suggest that the most important way for organization to develop its knowledge in a long term strategy is to define what the knowledge in organization is and how it is created and used. From analyzing process of doing a project in MED I think that the main source of knowledge in MED is the experience of people. Experience, tacit knowledge or know-how is difficult for people to define and express in words or documents. To help people express their experience and tacit knowledge I provide a knowledge gap tool that helps people within organization in their everyday working can describe and define their knowledge and know how they create knowledge.

By using the definition of each individual and overall organizational knowledge people and managers of the organization know how to develop and create knowledge for future work and strategy e.g. to develop individual knowledge, people should attend the training course or learning by doing. To develop faster the process of creating and using knowledge organization should apply IT to process information.

6 -Suggestions for further research

From analyzing the process by which MED carry out a project, I found out that the role of managers in decision making is very important and guides not only the way people work but also the way they use and create knowledge. For further study one aspect that is interesting is the relationship between the decision making process as well as organization structure with the knowledge creating, using process.

Reference:

[1] Appleyard, M. M. (1996) *"How does knowledge flow: Interfirm patterns in the semiconductor industry"* Strategic Management Journal 17 (Winter Special Issue), 137-154.

[2] Bhatt Ganesh D. (2000) "*Organizing knowledge in the knowledge development cycle*" *Journal of Knowledge Management* Vol. 4 No 1 pp. 15-26

[3] Bloodgood James M. , Wm. David Salisbury (2001) "*Understanding the influence of organizational change strategies on information technology and knowledge management strategies*" Decision support system 31 55-69

[4] Chadwick Samantha & Hanson Dallas (2001) *"Environmental Management, Structure, Networks and Information Exchange: The Case of a Tasmanian Pulp and Paper Mill"* Prometheus, Vol. 19, No. 1

[5] Drucker, Peter F. (2001) *"The Essential Drucker"* HarperCollins Publishers Inc

[6] Earl,. M. (2001) *"Knowledge management strategies: Toward a Taxonomy"* Journal of Management Information System (summer) Vol. 18, No.1, pp.215-233.

[7] Gilmour David (2003) *"How to fix Knowledge Management"* Harvard Business Review October pp 16-17

[8] Hamel Gary (2002) "*Leading the revolution*" – Penguin Group

[9] Hellgren Bo & Torbjorn Stjemberg (1987) "*Networks: An Analytical Tool for Understanding Complex Decision Processes"* Int. Studies of Mgt. & Org., Vol. XVII. No. 1 pp 88-102 M.E. Sharpe

[10] Hippel, E. (1994). Von *"Sticky information and the locus of problem solving: implication for innovation" Management Science*, 40 (4), 429-439.

[11] Huber, G. (1991) *"Organizational learning: the contributing processes and the literatures" Organization Science*, 2 (1), 88-115.

[12] Huang Hu, J., , K-T., Kuse, K., Su, G-W., & Wang, K-Y. (1998) *"Customer information quality and knowledge management: a case study using knowledge cockpit*" *Journal of Knowledge Management*, 1 (3), 225-236.

[13] Im, I., & Hars, A. (1998) *"Knowledge reuse insights from software reuse"* In Proceedings of Fourth Americas Conference on Information Systems, Baltimore, Maryland, 14±16 August 1998, URL: http://wwwrcf.usc.edu/_iim/kreuse.html (Retrieved August 27, 1999).

[14] Kakabadse A (1991) "*The Wealth Creators: Top People, Top Teams and Executive Best Practice".* Kogan Page: London.

[15] Kalling Thomas *"Organization-internal Transfer of knowledge and the Role of Motivation: A Qualitative Case Study"* Knowledge and Process Management Vol.10 No. 2 (2003) 115-126

[16] Kaplan. Robert S. & Norton. David P. (1996) "*The Balance Scorecard"* Harvard Business School Press.

[17] Kleiner Art & George Roth (1998) *"How to make experience your company's best teacher"* Harvard Business review on Knowledge management

[18] Kought, B & Zander U (1992) *"Knowledge of the firm: Combinative Capabilities, and the Replications of Technology"* Organization Science, Vol 3. iss 3, pp 383-397

[19] Krogh Georg von, Nonaka Ikujiro, Aben Manfred (2001) *"Making the most of your company's knowledge: A strategic framework"* Long range planning 34 421 – 439

[20] Løwendahl, Bente R, Øivind Revang and Siw M. Fosstenløkken (2001) "*Knowledge and value creation in professional service firms: A framework for analysis*" Human Relations Vol. 54 (7): 911-931: 017841

[21] McNamara, G. & Bromiley, P. 1999. "*Risk and return in organizational decision making*" Academy of Management Journal, 42: 3, 330-339.

[22] Minbaeve Dana, Torben Pedersen, Ingmar Bjorkman, Carl F.Fey & Hyeon Jeong Park (2002) "*MNC knowledge transfer, subsidiary absorptive capacity and HRM"* Academy of Management Proceedings IM: F1

[23] Nonaka Ikujiro & Takeuchi Hirotaka *"The Knowledge Creating Company*" Oxford University Press 1995

[24] Ohmea Kenichi (1999) *" The borderless world"* HarperCollins Publishers, Inc.,

[25] Shin Minsoo, Tony Holden & Ruth A. Schimidt (2001) *"From knowledge theory toward management practice: Towards an integrated approach"* Inforamtion processing and Management 37 335-355

[26] Simpson, C. W., & Prusak, L. (1995) "*Troubles with information overload-moving from quantity to quality in information provision*" *International Journal of Information Management,* 15 (6), 413-425.

[27] Stewart ., Thomas A. (1997) "Intellectual Capital: The New Wealth of Organizations" *Doubleday*

[28] Stopford, J. M. (1995) "Competing globally for resources" *Transnational Corporation*, 4 (2), 34-57.

[29] Szulanski, G. (1996) *"Exploring internal stickiness: impediments to the transfer of best practice within the firm" Strategic Management Journal* 17(Winter Special Issue), 27-43.

[30] Targama, A & Diedrich, A (2000) *"Toward a Generic Theory of Knowledge and its Implications for Knowledge Management"* presented at the 7th Workshop on Managerial and Organizational Cognition ESADE, Barcelona 2000

[31] Werr Andreas & Torbjorn Stjemberg (2003) "*Exploring management Consulting firms as Knowledge syst ems"* Organization Studies 24(6): 881-998 SEGA Publications

[32] Yin, R. K (1994) *"Case study research : Design and method 2ed"* Thousand Oaks, *CA Sega Corp*

[33] Zack Michael H. (1999) *"Developing a Knowledge Strategy"* California Management Review, Vol. 41 No 3

[34] Zhu, H., Ma, J.,& Shi, X (1997) *"Analogy and abstract in cognitive space: A software process model"* Information and software technology 39, 463-468