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Knowledge Management Framework Development

A case study at Stena Renewable AB

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ABSTRACT

Knowledge is something that has concerned human beings for thousands of years. In the beginning it was knowledge regarding how to gather food in order to make the tribe survive. Today it is more about what knowledge is needed for companies to survive; how they can create, share and store knowledge in the most efficient way. Knowledge is today one of the most important assets for an organisation and it has to be managed just like any other asset to be successful.

Within Stena Renewable, a wind power company moving from being an entrepreneurial organisation into becoming capital-intensive and industrialised, a need has arisen to increase the structure of the company and also to have better control of their knowledge. Stena Renewable is most likely not a special case in the question of desiring a better structure for how to keep and develop knowledge within the organisation. Moreover, according to the authors, no easily acceptable framework presently exists which highlights the most important aspects of Knowledge Management. Following this issue, the purpose of this thesis was developed: *Through an extensive literature study of Knowledge Management create a framework that could be used to highlight its important aspects*. To validate the framework it was applied to the studied company, Stena Renewable. Recommendations for the company's continuous work within the field were subsequently offered together with a few general conclusions.

In order to achieve the purpose a qualitative research strategy, with a primarily deductive approach, was applied. The empirical findings were collected through interviews with the employees and daily observations. These findings were then analysed accordingly to the theoretical framework described in the thesis and the Knowledge Management framework was subsequently developed.

From this study it has been concluded that Knowledge Management is something that many companies most likely work with unconsciously. It is the awareness of the subject, its importance and benefits that can help them move forward and start creating a company that actively sharing and developing knowledge in an efficient way. Further, it was concluded that one of the most important things for successful Knowledge Management is the organisational culture. Without a culture that enhance knowledge sharing and creation it will be impossible to perform.

The specific recommendations given to Stena Renewable included that the organisation, without being aware of it, already are performing activities which enhances knowledge sharing and creation and have prerequisites for building a creative and learning organisation. Throughout this study the company's awareness for the subject of KM and its importance has increased, which is a vital first step for managing knowledge successfully. Finally, a few recommendations regarding concrete tools and methods for sharing, creating, and storing knowledge were also given.

Keywords: Knowledge Management, Organisational Culture, Knowledge Sharing, Knowledge Creation, Creativity, Learning Organisations, Knowledge Management Framework

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1 INTRODUCTION

The initial chapter presents the background and the purpose of the thesis. Furthermore, the research questions that have been developed to achieve the purpose are presented and the chapter is finally concluded with the delimitations of the report.

Knowledge is something that always has concerned humans; looking back for instance at the first hunters who taught the next generation the most successful practices to capture a prey. This shows on their concern about the group's expertise and skills and how they wanted to ensure the long-term viability of the group. (Wiig, 1997)

Knowledge as a subject has been researched and discussed ever since the classical Greece where it engaged famous philosophers such as Plato and Aristotle (Davenport & Prusak, 2000). But it is not until the beginning of the 1980s that research began related to how knowledge should be managed for business purposes (Wiig, 1997).

The reason behind this relatively new interest or focus in knowledge and, essentially, Knowledge Management is a derivative from the shift towards more knowledge and service-based industries (Sandberg & Targama, 2007). Increasing competition around the world makes knowledge a differentiating and competitive factor and by making people knowledgeable, companies will be able to keep up their innovative abilities as well as to create high quality products and services (Wiig, 1997). It seems then, that throughout history it has become more relevant to share knowledge in order for companies to survive rather than making the tribe survive.

To be able to implement a sustainable Knowledge Management strategy, it is important to understand what knowledge is. Who has it? Where is it? Who uses it? First then one can look into what cultural and behavioural issues that needs to be addressed to make the best use of it, and what kind of tools and methods which are effective. (Davenport & Prusak, 2000)

1.1 Background

Stena Renewable is a Swedish company situated in Gothenburg which projects and operates wind turbines. It was founded in 2005 and is owned by Stena Adactum, which in turn is a part of the Stena Group. Stena Renewable's business idea is to "*project, build and manage effective and efficient wind turbine parks for a long-term ownership*." (Stena Renewable, 2013, p. 7). Based on this business idea they have a vision to "*create a profitable and substantial business within the wind power industry based on good business acumen and high efficiency*." (Stena Renewable, 2013, p. 7). In their work towards the vision they try to follow their values *Sustainability, Effectiveness & Efficiency,* and *Respect* (Stena Renewable, 2013, p. 8).

Stena Renewable could be considered as being relatively small with their current 13 employees. The company currently has 86 turbines with an additional 10 under construction and are planning to build up to 40 new turbines every year. The project base described, positions them as one of the three biggest actors on the Swedish market for renewable energy. Even if they are planning to expand the business, regarding the number of wind turbines, they are presently not planning to grow to any large extent in number of employees.

Stena Renewable is in an interesting phase as they are moving from being a typical entrepreneurial organisation into becoming capital-intensive and industrialised. Due to this change, a need has arisen to implement new systems and methods in order to increase

the structure of the company. The area that the company sees as one of the primary needs of structure improvements is the area of Knowledge Management.

The knowledge the company possesses is largely stored in and dependent upon the individuals who work there, thus they are subject to a high risk for instance in the event that someone decides to leave the organisation. Up until now, the company has felt that excel documents and personal phonebooks have been sufficient sources of information, but as they are planning to expand and leave the entrepreneurial stage, new systems and working methods will be needed to be implemented. As a first step towards dealing with the issue, an implementation of a case management system called Qoll will be made shortly after the thesis is finished. The purpose of the system is fast retrieval of information and increased safety. Furthermore, the system is designed to provide a database for all fixed assets included in the wind turbines; monitoring complaints and feedback from internal and external users and provide templates for environmental inspections and risk assessments. Moreover, there is a need to be able to deal with the issues within Knowledge Management which are not covered by Qoll. The company faces issues regarding how to create, share and store knowledge in the most efficient way.

Stena Renewable is most likely not a special case in the question of wanting a better structure for how to keep and develop knowledge within the organisation. Presently, there are many different theories that separately highlight important aspects of Knowledge Management, but no, according to the authors, framework that binds together these aspects together in an easily acceptable way. There is a gap in the theory where a framework, that can be used to give organisations a solid overview and a starting point for discussing the subject, is missing.

1.2 Purpose

Based upon the problem described above, a framework for how organisations can create a solid overview of the different parts of Knowledge Management is sought to be created. The framework should be easy to accept and discuss around to enable successful implementation of Knowledge Management. Therefore, the following purpose has been developed:

The purpose with this thesis is through an extensive literature study of Knowledge Management; create an easily acceptable framework to highlight its important aspects. The framework should then be validated by applying it to Stena Renewable.

1.3 Research Questions

Based on the purpose presented above one main research question and two sub questions have been formulated.

Main research question: How could a generic framework for Knowledge Management be constructed?

As it becomes more vital for companies to start managing their knowledge it seems to be essential to have an easy starting point; something to base a discussion on. Therefore, the main question focuses on finding a generic framework that could be used by various types of organisations when wanting to start discussing the area of Knowledge Management. The framework should give organisations, independent of size and industry, an overview of the subject and its challenges.

To be able to answer the main question the following two sub questions first need to be addressed.

Sub question 1: What main theories exist for Knowledge Management and are they competing against, overlapping or complementing each other?

Through this question the researchers intend to identify the different main theories in existence regarding which important factors and challenges that are important to consider as well as which tools that can be used and which the possible outcomes are when working with Knowledge Management. Subsequently, based on an analysis with a focus to find if these theories are contradicting, overlapping or complementing each other, a framework can be created.

Sub question 2: How does Stena Renewable respond and react when studied upon from the developed framework?

The second and final sub research question aims to describe the validation process for the framework. An analysis of Stena Renewable's current situation according to the developed framework will be done to see how well it can be applied. The framework will also be presented to and discussed with the employees to see how they respond and react; if a discussion regarding the subject is initiated in the wanted direction and whether they start to relate the issues and areas brought up to their own work and the company in general. Based on the analysis and the company's response the framework could then be confirmed or rejected.

1.4 Delimitations

The purpose of this thesis is, as mentioned above, to do an extensive literature study and develop a framework for Knowledge Management. The focus is on the factors that are important to consider and not how an actual implementation would look like.

The thesis is limited to validate the framework by applying it to only one company, due to that testing it one more cases would not fit the timeframe. The timeframe has also limited the thesis in the question of researching the actual outcomes, therefore these are only analysed briefly. In order to study the outcomes extensively, another type of study, such as a longitudinal study for instance, would be required.

2 METHODOLOGY

This chapter presents the methodology of the thesis. Specifically, it describes the choice of research strategy and process as well as the choice of research design including data collection methods and data analysis. The chapter ends with a discussion regarding how the quality of the research is ensued.

An overview of the research methods and designs that have been used are presented below in connection to the research questions, see Table 1.

Goal	Research question	Research design	Data collection Method
Construct a framework	How could a generic framework for Knowledge Management be constructed?	Qualitative	Literature review
What main theories exist	What main theories exist and are they competing against, overlapping or complementing each other?	Qualitative	Literature review
Find out if the existing theories competing against, overlapping or complementing	What main theories exist and are they competing against, overlapping or complementing each other?	Qualitative	Literature review
Reject or confirm the framework	How does Stena Renewable respond and react when studied upon from the developed framework?	Qualitative	Observations Interviews Literature review
General recommendations for working with KM	*No research question regarding this area*	Qualitative	Observations Interviews Literature review
Recommendations for how Stena Renewable should continue their work with KM	*No research question regarding this area*	Qualitative	Observations Interviews Literature review

Table 1. Overview of research methods used

2.1 Research Strategy

When conducting business research there are, according to Bryman and Bell (2011), two types of research strategies that can be used; either a quantitative or qualitative method can be used. The main differences lie in how data are collected and analysed. A quantitative research strategy emphasises quantification in the data collection and analysis. Most often, the quantitative strategy has a deductive approach which means that it can be used for testing theories. A qualitative research strategy on the other hand emphasis words rather than numbers and the strategy usually has an inductive approach which is used to generate new theories. It is however worth to be noted that a qualitative research does not have to have an inductive approach, and a quantitative research does

not have to be deductive. It is for example possible to use a qualitative research strategy to test rather than generate theories. (Bryman & Bell, 2011)

The strategy used in this study is qualitative due to that the area is closely connected to social interactions, behaviour, and company culture. This means that the focus was on understanding rather than quantifying (Bryman & Bell, 2011). Furthermore, the research had both a deductive and an inductive approach, more about this in chapter *2.2 Research Process*.

Qualitative research are often criticised as being too subjective because it is based on the researchers' interpretations in terms of what they find important and significant as well as because the researchers often work closely with the people studied. Qualitative research is also criticised because it is hard to replicate due to the specific environment that is studied. Connected to this is also the issue of generalisation. (Bryman & Bell, 2011)

More about how these problems and issues are treated will be discussed in chapter *2.4 Quality of Conducted Research*.

2.2 Research Process

The selected research process followed, to a beginning, a deductive approach visualised in Figure 1. The reason for the choice is based on the first part of the purpose for this thesis; to create an acceptable framework for Knowledge Management. The process therefore started with a broad theory study into several related areas as well as the main subject. Based on the theories found; a hypothesis, i.e. the framework, was created. Subsequently, the authors specified what data they needed to collect from the studied company in order to test the hypothesis.

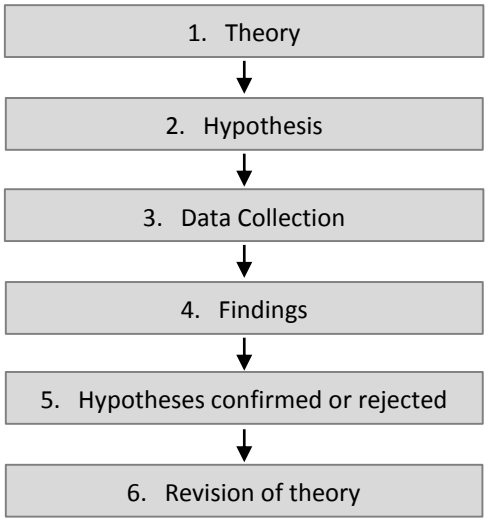

Figure 1. A deductive research process

When the authors entered the phase where the collected data should be analysed according to the hypothesis and the theoretical framework, the process turned into having an inductive approach instead. Based on the authors' findings the hypothesis was to be confirmed or rejected and the theory would be revised accordingly. Through these final steps of the process the research would be able to fill the gap that exists in the theory regarding Knowledge Management. In other words, the process went back to the traditional view of a qualitative research with an inductive approach that facilitates development of new theories (Bryman & Bell, 2011).

Worth noting, is that the research process described in the figure above appears very linear, which is not always the case (Bryman & Bell, 2011). In this thesis a few loops in order to review, add, or change the theoretical framework presented were made based on the new data that was collected and analysed. These loops were also a result of that the problem was initially relatively loosely defined and the researchers' knowledge in the area was low, thus the loops back into earlier steps in the process were also required to tighten the specifications and research questions.

2.3 Research Design

A research design provides a framework for the collection and analysis of data. The choice of design reflects the priority of different aspects of the research. These aspects are: causality between variables, generalisation beyond the studied environment, and understanding of social behaviour in the context. (Bryman & Bell, 2011)

The research design used for this thesis is a case study. A case study "*focuses on understanding the dynamics present within single settings*" (Eisenhardt, 1989, p. 534). This understanding is gained through detailed and intensive analysis of a case, which can be an organisation, a location, a person or a single event (Bryman & Bell, 2011).

Due to that the last part of the purpose for this thesis was to validate the created model for Knowledge Management by applying it on Stena Renewable, the choice of a case study design seemed to be appropriate. To be able to confirm or reject the hypotheses, the researchers needed an understanding for the company, its situation and work processes etc. It was therefore decided that interviews with all employees would be done together with daily observations. More about the methods used can be found in the following chapter.

2.3.1 Data Collection

Literature review. An extensive literature review has been conducted. The authors started with reading articles, books and digital sources about the subject Knowledge Management in general, in order to acquire an overview of the subject and to be able to write questions for an initial interview round with all employees. Hereafter, the problem the company was facing became clearer and the aim could be closer specified.

The literature review continued but became more specific. Books, articles and digital sources were now used to find information about knowledge, information, Knowledge Management, learning organisations etc. When the authors started to develop a deeper understanding for the subject a new interview was conducted with the CEO of Stena Renewable in order to make corrections to the aim and purpose of the project.

The final part of the literature review was used to bind all theories together and create a hypothesis, a framework for Knowledge Management. This meant that a few loops back to the literature review step were done until the authors felt that they had the knowledge needed and were satisfied with their hypothesis.

Interviews. When interviews are done in a qualitative study one usually allows less structure and high flexibility. The interviewer may take off at any tangents to gain a more profound understanding of the interviewee's point of view in order to see what he/she thinks is relevant and important. In other words, the interviewer is looking for rich and detailed answers. It is also common in qualitative interviewing that the interviewees are interviewed at several occasions. (Bryman & Bell, 2011)

Bryman and Bell (2011) brings up two types of interviews, unstructured and semi-structured. In an unstructured interview the interviewer may only have a single question, the interviewee is then allowed to response freely and the interviewer follows up on points he/she finds interesting. This type of interview quite closely resembles the characteristics of an everyday conversation. In a semi-structured interview on the other hand, the interviewer has a list of questions and topics that should be covered, referred to as an interview guide. The interview guide must not be followed exactly, and the interviewer may ask questions not listed in the guide, to follow up on interesting comments from the interviewee. But in the end all questions should have been asked and a similar wording should be used from interview to interview when conducting it with several subjects on separate occasions. (Bryman & Bell, 2011)

The interview technique used for this study is semi-structured due to that the authors had a fairly clear focus on what they were investigating and were not looking for any general notions on the topic. Two rounds of interviews in total were conducted with all 13 employees at Stena Renewable although a couple of extra interviews/discussions were held with the CEO in order to clarify more specific areas such as the purpose from the company's side as well as to straighten some ambiguities. The aim of the initial round was to both present what the thesis was about as well as to investigate what the employees' thoughts and ideas were about the subject. The second round aimed to give the authors a deeper understanding for the employees work processes and views upon more focused areas. In the preparation of the interview guide, some additional thoughts were given to the order of the topics so that there is a flow between them, the formulation of the question so that they help answering the research questions, the language used thus allowing it to be relevant for the people interviewed, and that there were no leading questions asked so that the interviewees point of view could be captured.

Observations. Participant observation is an approach "*in which the researcher is immersed in a social setting for some time in order to observe and listen with a view to gaining an appreciation of the culture of a social group*" (Bryman & Bell, 2011, p. 389). During an observation the researcher may end up with a close work relationship with the participants as they are involved in the same kinds of daily routines. However, through such close observations and involvement the researcher will learn the "native language", the words and slang used within the studied environment. This will in turn make it easier for the researcher to understand and see the organisation from the employees' perspective. (Bryman & Bell, 2011)

Participant observations are a good complement to qualitative interviews. It gives the researchers the opportunity to analyse whether what is said actually matches what is done. It also enables the determination of hidden activities within the organisation, activities and behaviours that the employees are not aware of or are taking for granted and therefore are not express in interviews. (Bryman & Bell, 2011)

During this study the authors have been located at Stena Renewable's office where they had their own workplaces. The authors always had their doors open in order to be able to hear and see how employees interacted, behaved, and what kind of discussions that were held in the corridor and around the coffee machine. These "everyday" observations also included eating lunch with the employees as well as participate in the conversations that appeared in the kitchen and around the screen showing real time information regarding for instance the current energy production. The authors also participated as observers in management meetings, project meetings and the monthly meetings for all employees.

2.3.2 Data Analysis

Throughout the literature review the authors have analysed and compared different theories against each other. This was done so that in the end they could be combined into a framework for Knowledge Management. Through this review and analysis of the theory the authors' answers the first sub question: *What main theories exist and are they competing against, overlapping or complementing each other?*

Once the literature review and the developed framework for Knowledge Management had been constructed, the framework was validated through an application to Stena Renewable. Initially, the company was analysed based upon the different aspects included within the developed framework. This was done in order to see whether a company actually could be analysed based upon it as well as whether the important aspects observed at Stena Renewable did fit into the categories selected for the framework. Finally, observations to how the company reacted when they were presented with the framework were noted. Since the thesis aimed at developing a framework which can serve as a base for discussions as well as to create an awareness for the topic, the framework was primarily validated through examining the employees' reactions at the company. If discussions began spontaneously and the employees would start relating the different elements of the framework to their own work and company as a whole, the framework would be considered a success.

Based on this validation the authors could answer the second sub question: *How does Stena Renewable respond and react when studied upon from the developed framework?* And the answer also results in confirming or rejecting the framework which in turn will answer the main research question: *How could a generic framework for Knowledge Management be constructed?*

2.4 Quality of Conducted Research

To ensure the quality of a qualitative research it can be evaluated based on the criteria of trustworthiness, which in turn consists of the four elements; credibility, transferability, dependability, and confirmability (Bryman & Bell, 2011).

Creditability is connected to the fact that there can be many different views of the social reality and that the researcher must ensure that his or her understanding of this reality is accepted by the members in the social setting studied (Bryman & Bell, 2011). To ensure the credibility a dialog has been held with the company continuously through the project to ensure that the empirical data are presented in an acceptable way. The credibility was also ensured through data source triangulation. Firstly by doing multiple interviews, and secondly, the researchers confirmed their observations with interview questions to determine whether or not they had misunderstood what they have seen.

Transferability refers to whether the findings from a particular social context can be applicable to another context or study (Bryman & Bell, 2011). To overcome this problem and make it easier for others to judge whether the findings in this thesis are applicable to other cases, an extensive and detailed description of the company and its context is given.

Dependability, or reliability as it is also can be referred to, means the degree to which a study can be replicated and whether or not the research team agree about what they have observed (Bryman & Bell, 2011). To improve the dependability, both members of the research team participated at all interviews. Extensive notes were taken, and the researchers independently viewed and discussed the notes after each interview to ensure they had the same view of what had been said.

The last criteria, confirmability, deal with the researchers' objectivity in relation to the studied phenomena (Bryman & Bell, 2011). The researchers did not see any apparent risk for being subjective. However, due to the researchers' awareness that complete objectivity in qualitative research is difficult, reflexivity was applied, meaning that the authors reflected upon how their knowledge, experiences and attitudes could influence what they saw and how they saw it.

3 THEORETICAL FRAMEWORK

Knowledge Management is a wide area which can be viewed from many different perspectives. This chapter starts with a philosophical presentation of what knowledge is and how it can be categorised. Creating and developing knowledge is closely related to learning, therefore the prerequisites for a learning organisation will be presented before an explanation of Knowledge Management will be given. Learning is largely dependent on the human being, and as it will appear, Knowledge Management is in many ways connected to how people behave and thus there will be a separate section regarding organisational culture.

There is a structural change arising in the industrialised world as it is now shifting to become more knowledge and service-based (Sandberg & Targama, 2007). The change of focus has made companies look for organisational structures and methods that support the management of knowledge and competence development (Sandberg & Targama, 2007).

According to Ling (2011) as well as Davenport and Prusak (2000), knowledge is the most important organisational resource. Wenger (2004) also points out the importance of managing knowledge (Knowledge Management) and says that "*if knowledge is a strategic asset, then it has to be managed like any critical organizational asset. It is too important to be left chance*" (Wenger, 2004, p. 1). Knowledge can be compared to the more tangible assets such as land, labour and capital. These are assets that a company never would leave out, so why should they leave out knowledge? (Ling, 2011).

3.1 Dimensions of Knowledge

From a philosophical point of view, there are two dimensions which have to be addressed before talking about Knowledge Management. Initially, there is the Epistemological dimension which deals with the conversion between different types of knowledge, hence enabling creation of new ideas and concepts. Furthermore, there is the Ontological dimension which handles the social interaction that leads to knowledge development. (Nonaka, 1994)

Epistemological issues are related to what should be regarded as acceptable knowledge in a specific field. In the organisational knowledge case, the issue is whether a social science study can and should be studied on the same principles as natural sciences. The school which argues that this is the case is called Positivism and is contrary to Interpretivism which argues that a distinction in the research approach has to be taken when dealing with people instead of physical objects. (Bryman & Bell, 2011)

Moreover, ontological issues deal with whether social objects have a reality of their own or if they are socially constructed. Initially, there is Objectivism which allows the discussion of an organisation or "culture" as a tangible object which is a reality regardless of the individuals that are part of it. The counterpart in this dimension is called Constructivism which argues that the same phenomena are continually being built by their social actors. (Bryman & Bell, 2011)

3.2 Knowledge and Information

One important aspect which needs clarification is the difference between information and knowledge. The terms are sometimes used interchangeably, even though there is a clear distinction between them. Nonaka (1994) describes them as: *"In short, information is a flow of messages, while knowledge is created and organized by the very flow of*

information, anchored on the commitment and beliefs of its holder". (Nonaka, 1994, p. 15)

There are, generally speaking, two distinct views on information; the Syntactic and Semantic perspectives. Briefly, it could be said that the syntactic view sees information in terms of its volume with no specific regards to the value of it, much like a telephone bill only states for how long the customer have been speaking, and not how valuable the information exchanged was. On the other hand, the semantic view focuses on the very meaning of the information and delivers the definition of information as "contains new meaning". The syntactic view is more of interest when studying the engineering challenge of delivering information through for instance a telephone or internet cable whereas from a Knowledge Management perspective, the semantic side becomes more central. (Shannon, 1949)

This leads us to the definition of knowledge. From an epistemological perspective follows the knowledge definition: "*justified true belief*" (Nonaka, 1994; Steup, 2005). What this tells us is firstly that something which is false cannot be known, thus truth is required. Furthermore, someone also has to believe the proposition for it to be known, hence the belief part. Finally, justification is part of the definition to ensure that knowing something is not just a matter of luck. (Steup, 2005)

3.2.1 Tacit and Explicit Knowledge

In order to try and further understand what knowledge is, it is convenient to try and define different types of knowledge. It will furthermore enable the development of tailored models of for example knowledge sharing for each type, intending to make them more effective. Polyani (1962) was one of the first to develop the idea "*that there are things that we know but cannot tell*" (Polyani, 1962, p. 601), he called this form of knowledge "tacit" and describes it as the knowledge of skills or a personal quality, hence making it strongly related to actions (Nonaka, 1994). On the other hand, "explicit" knowledge is something which is possible to share in a formal language (Polyani, 1962). Consider the ability to ride a bicycle; someone might be able to cycle perfectly fine, without being able to tell exactly how their muscles are coordinating in order to keep the balance. It appears then that "*we are aware of them in terms of this performance and not (or only very incompletely) aware of them in themselves*" (Polyani, 1962, p. 601)

Two further examples given by Polyani (1962) are our ability to recognise people we know or for a doctor to diagnose a disease. A person may be described with different attributes such as being tall and having black hair, however this description usually fits a lot of people, yet someone who knows this person will have no trouble identifying the specific individual from all of them. Moreover, textbooks may teach a medical student the different symptoms of diseases, but without learning to apply it, this knowledge becomes useless. "*The medical practitioner does not diagnose the appearance of a disease, but its presence*" (Polyani, 1962, p. 604)

Polyani (1962) also takes the idea of tacit knowledge one step further by differentiating between the performance of a skill, such as riding a bicycle, and what he refers to as the intellectual counterpart which is in essence identifying clues, such as the characteristics of a face or a disease, and achieving an understanding of them by a practised effort of intelligence. This split of tacit knowledge is not unique to Polyani, another author who has discussed the topic extensively is Johannesen and even Aristotle had ideas similar to the ones described.

According to Johannessen (1999), Aristotle divided knowledge into Scientific Knowledge, Practical Wisdom, and Craftsmanship where Scientific Knowledge can be viewed as a form of explicit knowledge. He states that it contains the necessary and that it is eternal and unchangeable. Practical Wisdom and Craftsmanship on the other hand can be viewed as two types of tacit knowledge. Aristotle meant that Practical Wisdom is things that cannot be thought or forgotten. It is about knowing what is morally right in a specific situation. He means that if one forgets his/her Practical Wisdom one should stop existing as a moral and responsible human being. Craftsmanship can, however, be thought and forgotten. This knowledge is about being able to make something based on a correct understanding of the situation. (Johannessen, 1999)

Johannessen (1999) himself instead divided knowledge into Propositional Knowledge, Intransitive Understanding, and Practice where Propositional Knowledge is knowledge which can be gained through reading, and therefore can be viewed as explicit. He states that this knowledge is based on the other two types of knowledge, which he also refers to as tacit. These two types of knowledge is Intransitive Understanding which is gained from the exchange of experiences with colleagues and Practice which is gained through pursuing the profession ourselves. (Johannessen, 1999)

3.2.2 Knowledge Conversion

Generalising all knowledge as belonging to one of the two main groups, tacit and explicit, enables the division of four different types of knowledge conversion (all possible combinations of the two, including the conversion from tacit to tacit and from explicit to explicit) of which all are required for an organisation to learn, see Figure 2. The first mode, which is called Socialization, describes how someone's tacit knowledge is converted into tacit knowledge within someone else through the interaction with people. This form of transformation is mostly experience based and it is important to remember that language does not have to be part of the transfer but other things like observation, imitation, and practise can come into play. The second mode, Combination, involves the combination of different sources of explicit knowledge held by individuals through for example meetings and telephone conversations in order to create new explicit knowledge. This is done by sorting, adding, recategorising, and recontextulising existing knowledge. Thirdly, there is a mode called Internalization which is similar to traditional concept of "learning" and involves the transfer from explicit into tacit knowledge. The concept of actions is important within this area. Finally, there is the mode called Externalisation which involves the transfer from tacit into explicit knowledge and is strongly associated to metaphors. According to Nonaka (1994), Externalisation is not as developed in organisational learning theories as the other three. (Nonaka, 1994)

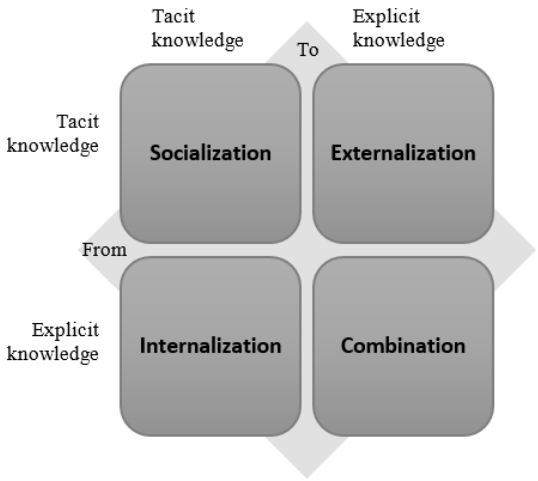

Figure 2. Nonaka's model for knowledge conversion

Nonaka (1994) further develops this model by making it three dimensional in the sense that it spins through different levels of the organisation as presented below, thus forming a spiral model, Figure 3. The spiral model is based upon the idea that all knowledge starts as tacit within one individual and through the four modes of conversion it grows to higher levels. The spiral also goes the opposite direction; knowledge created at an inter-organisational level is converted and transferred down to the individual. (Nonaka, 1994)

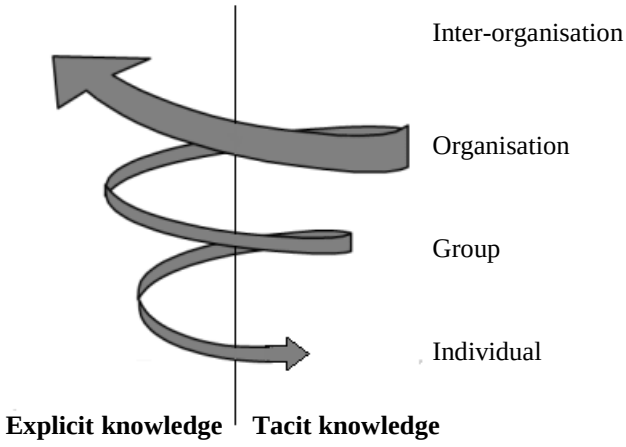

Figure 3. Nonaka's spiral model

3.3 Learning Organisations

It has been said that it is now more vital than ever that organisations gain new knowledge as well as share knowledge since competition grows more fierce, technology advances, and customers' preferences change at an increasing speed. If an organisation manage to create a learning environment they will most likely be quicker than its competitors to adapt to unpredictable events. (Garvin, Edmondson, & Gino, 2008)

For an organisation to be able to learn, the employees have to share their knowledge both horizontally and vertically. To make the employees encouraged to be open and share knowledge, the organisation needs to have a structure that supports these kinds of behaviours. The characteristics for a learning organisation is a flat decentralised organisation, with information freely available, a culture that emphasise trust, managers that are coaching rather than directs the employees, and the organisation need to have a

learning system that is based on continual learning. (du Plessis, du Plessis, & Millett, 1999)

According to Senge (1990), a learning organisation is "*a place where people are continually discovering how they create their reality. And how they can change it*." (Senge, 1990, p. 13). To be able to create a learning organisation the employees need to change their mind-set. They have to stop seeing themselves as separate from the world, as passive participants in the creation of their reality, seeing problems as something that is caused by someone or something "out there", and stop reacting to the present. Instead the employees have to see themselves as connected to the world, as participants that actively shaping their reality, see that their actions create the problems they experience and that they are creating the future. It is then the gap between this reality and the vision that fosters learning and makes people move forward, see Figure 4. (Senge, 1990).

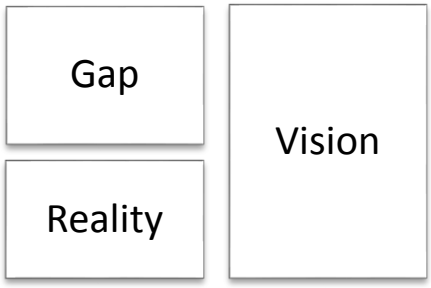

Figure 4. The gap which creates a learning organisation

3.3.1 Four Dimensions of Reality

But what is reality? What it is that constructs our realities are according to Nørreklit et. al. (2006) the dimensions: facts, logic, values, and communication, see Figure 5. These elements will be briefly described below

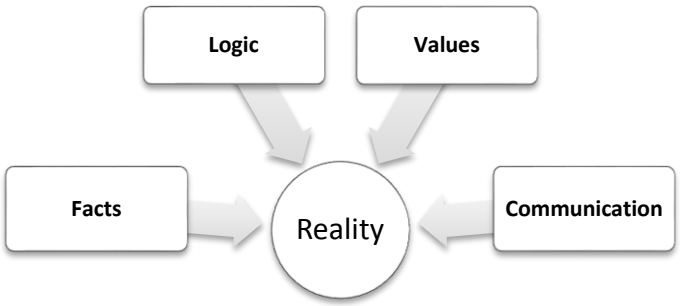

Figure 5. The four dimensions of reality

For a thing to be called a fact it has to be recognised by an actor and be established so that it is able to exist independently of any actor or any language. (Nørreklit, Nørreklit, & Israelsen, 2006)

Based on known facts, possibilities can be created. Without any possibilities a company will not be able to act and plan the future, which means that it will not exist anymore. While facts are identified through empirical procedures, possibilities are identified and constructed through reflection and the use of logical operations. In other words, possibilities are created when we reflect upon our previous knowledge and challenge the facts which are already known. This means that the movement from a set of facts to a

possibility is the result of systematic reflection. Through logical operations we are not only evaluating already given concepts, but also creating new concepts and visions of possibilities. (Nørreklit, Nørreklit, & Israelsen, 2006)

Possibilities as such will not make anything happen. To be able to choose between and act upon different possibilities one has to have a reason for it. This reason is based upon a person's values, which will then translate the person's will and energy into action. (Nørreklit, Nørreklit, & Israelsen, 2006)

When values and possibilities are integrated one will create an individual reality. Subsequently, in order to be able to create a shared reality, communication is needed. Communication makes it possible for people to cooperate and for management to understand employees' values and reasoning. Therefore, communication makes it possible to establish shared values and a shared logic that can be used in an organisation. (Nørreklit, Nørreklit, & Israelsen, 2006)

It is then the gap between this constructed reality and an organisation's vision that makes the company move forward, gain new knowledge that is needed to get closer to the vision.

3.3.2 Five Disciplines

Senge (1990) integrates the creation of a reality and the vision into five disciplines; Personal Mastery, Mental Models, Shared Vision, Team Learning, and System Thinking. He states that these disciplines are the core to a learning organisation and they all have to be developed together, see Figure 6. He argues that these disciplines are a lifelong learning program that is needed to maintain a learning organisation. (Senge, 1990)

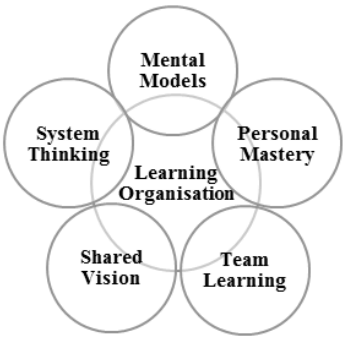

Figure 6. Five disciplines

Personal Mastery. The foundation of a learning organisation is "*personal growth and learning*" (Senge, 1990, p. 126) which is Senge's definition for personal mastery. People with high level of personal mastery are skilled at creating their personal vision; identify what matters the most to them. The gap between our personal vision and the reality is what makes us move forward towards a desired future. A high level of personal mastery makes one stay in a continual learning mode, it fosters the personal motivation and we learn how our actions affect the world. This is the reason why people with high level of personal mastery tend to take more initiative, learn faster and have a deeper sense of responsibility in their work. These benefits are in turn the reasons for why many organisations are fostering personal growth among the employees, hoping to make the organisation "smarter". (Senge, 1990)

Mental Models. Assumptions, generalisations and pictures that affect the way we understand and make sense of the world and how we take action can be summarised as our mental models. Most often, people are not aware of their mental models and how they influence their behaviour. How our mental model affects our behaviour depends on how we see things. Consider two people with different mental models observing the same

situation. They will most likely describe the situation in different ways because they focus on different details. Our mental models are often the reason why we cannot, or it is hard to, put new insights into practice. The new insights are often in conflict with our deeply rooted pictures and images of how things should be done. This is then limiting us to act and think in a way what is familiar for us. The discipline of managing mental models is focusing on the openness needed to determine the deficiency in our current way of seeing the world. By testing and improving our internal mental pictures of how the world works we will foster a learning organisation. (Senge, 1990)

Shared Vision. A company usually has a vision of what they want to create and become. It is important that the employees share this vision since it can generate a team spirit through the whole organisation and thus connect different activities and departments. First when the employees are truly committed to the vision, it can be viewed as being shared. The commitment will develop if the employees care for the same things and through this are bound together around a common identity and sense of destiny. This means that a shared vision has to emerge from a person's personal visions. When an organisation have a shared vision people will learn and excel because they want to, not because they have to, which is vital for a learning organisation. (Senge, 1990)

Team Learning. When members of a team successfully communicate with each other, they can "*enter into a genuine 'thinking together'*" (Senge, 1990, p. 12). The aim is that as teams are starting to think together and are truly learning they will develop extraordinary capacities for coordinated actions that would otherwise have been impossible for individuals to develop themselves. Team learning also results in that the members learn to look for the bigger picture that lies beyond the individuals' perspectives. Team learning is essential for organisational learning because the teams create a microcosm for learning within the organisation. Skills developed within a team can also subsequently be transferred to other individuals and other teams. To have a well-functioning team where energy is not wasted through members that are working hard for no use, the team has to be aligned. This means that the team has to have the same view of the purpose, a share vision, and an understanding of how they complement one another's skills and efforts. (Senge, 1990)

System Thinking. To be able to see the big picture one has to bind together the four disciplines presented above. Through a system thinking approach one can see the whole, see interrelationships rather than things, and see patterns of change rather than static snapshots. System thinking is the base for understanding important problems and creating conditions where types of events become likely to happen. To be able to do this one have to study the underlying structure that shape individual actions, and look beyond personalities, individual mistakes, bad luck, and events. (Senge, 1990)

3.4 Knowledge Management

In previous sections it has been discussed what knowledge is, different types of knowledge have been presented and the different ways of converting it as well as why having a learning organisation is important. The thesis will now move on to discussing how to manage the knowledge within the organisation. Initially, this section will focus on what is required for successful Knowledge Management, what the process could look like and the possible outcomes of it may be.

In the literature there are a few different definitions of Knowledge Management, KM. The definition used in this thesis is as follows:

"*Knowledge Management is the process of creating, capturing, and using knowledge to enhance organisational performance. It refers to a range of practices and techniques used by organisations to identify, represent, and distribute knowledge, know-how, expertise, intellectual capital, and other forms of knowledge for leverage, reuse and transfer of knowledge and learning across the organisation*" (Iandoli & Zollo, 2007, p. 7)

3.4.1 Shared Vision, Understanding and Meaning

To begin understanding KM in a deeper sense, the core of an organisation will be discussed. The core in this case is what the organisation strives to become and what it is that brings people together, the vision. One author who is specialised in this area is Senge (1990), who is talking about the need for an organisation to have a shared vision and shared mental models about the business reality within which they operate to be able to create a learning organisation. Sandberg and Targama (1998) are instead talking about a shared understanding for the work as such and that this is the base for collective learning and competence development.

Sandberg and Targama (1998) state that the foundation of an individual's competence is the specific understanding for his/her own work. To be able to understand one's work, one has to reflect upon and distance ourselves from it. Through reflection awareness regarding the pre-understanding for the work is created, based on this the competence then will develop. (Sandberg & Targama, 1998)

In the same way is the foundation of a team's competence based on the groups shared understanding of its work, also referred to as the group's shared meaning. A shared meaning is created first when the individuals are communicating with each other and when they share language, rules, norms, and images (Crossan, Lane, & White, 1999; Sandberg & Targama, 1998). This is then the base for collective competence development (Sandberg & Targama, 1998). To be able to create a shared meaning within a group of people the members have to interpret, observe and discuss activities in their surrounding until they agreed upon a common language etc. (Daft & Weick, 1984).

3.4.2 Accelerators for Successful Knowledge Management

The chapter is now moving on to the things which facilitate KM; the accelerators. Whether it should be called accelerators, building blocks, perspectives, elements or success factors can be argued. However, they all serve the same purpose; facilitating a successful work with Knowledge Management. In the theory one can find many different lists of factors that need to be managed, but generally they cover more or less the same aspects.

The Asian Productivity Organisation, APO, mention four accelerators: Leadership, Processes, People, and Technology. They state that there needs to be a leadership in place that is supportive and drives the KM initiative in the right direction; in line with the organisations mission and vision. The organisation also needs effective tools and techniques (technologies) that assist in creating, storing, and sharing knowledge. But to be able to generate and use knowledge an organisation would also need people. These people then need to trust each other to be willing to share their knowledge. For the employees to be able to share and create knowledge in effective way there have to be systematic processes in place. (APO, 2009; APO, 2010)

Uit Beijerse (2000) presents four other accelerators. He uses the same elements to describe how to manage an organisation as such, as how to manage the knowledge within the organisation. The elements he talks about are: Strategy, Structure, Culture and

Systems, and by steering these in the right direction an organisation will ensure an optimal KM process. Uit Beijerse (2000) states that based on a company's business strategy, regarding in what direction they are going, they can determine the goals on short and medium terms for the organisation's knowledge. To then make it possible for the employees to use their knowledge in a productive way there have to be a clear division of work, tasks and responsibilities, both horizontally and vertically. This structure can then help the employees know where to turn for the right information. In order to make the employees motivated to talk to each other and share their knowledge the organisational culture have to be built upon shared values, norms, and views as well as a mutual language. When an organisation has a strategy, structure and culture that enhance KM, they can through effective use of systems, such as rules, procedures, guidelines and instruments, make information, capacities and attitudes more productive. (uit Beijerse, 2000)

Karabag (2010) instead talks about critical success factors and critical barrier factors and has in his study evaluated a number of different authors' theories regarding which factors that influences KM the most. The factors (both success factors and barrier factors) that the author brings up as the most important to succeed are: Culture, Management Support, Motivation Aids, and System & Content Quality. In connection to culture he highlights the importance of having an open and honest communication both vertically and horizontally within the organisation. As well as having a culture that emphasis trust and transparency. Management support means that there need to be a leadership in place that is supportive and drives the KM initiative, but management also need to determine the suitability of financial and nonfinancial rewards; what motivates the employees. For the employees to be able to share and create knowledge in an effective way, systems should be accessible and easy to use, and documents should be relevant for the organisation and stored at the right place so they are easy to find. (Karabag, 2010)

Another combination of factors is brought up by Ling (2011) who, through a comprehensive literature review, lists: Culture, Leadership, Employee Participation, Organisational Structure, and Information & Communication Technology (ICT) as important for successful KM. If the values, norms, attitudes, and behaviours within an organisation create a positive culture the working environment will most likely be enjoyable for the employees which in turn lead to increasing the business performance. A positive culture will also increase the level of teamwork, the sharing of knowledge and the openness to new ideas (Goffee & Jones, 1996). Even if an organisation has the desired culture, the leadership has to be supportive to enable the KM (Ling, 2011). A positive culture and a supportive leadership can encourage the employees to participate. Participation most likely develops the spirit of teamwork, which ensures that the right information will reach the right people at the right time (Ling, 2011). The flow of information as well as the culture will also be affected by the organisational structure (Ling, 2011). To easily manage a change within an organisation it is preferable to have flatter and not so complicated structures, which most often is the case for small and medium-sized enterprises (Ling, 2011). For the organisation to then increase their efficiency they can use ICTs such as e-mail, internet, intranets, groupware etc. This kind of technology makes it easier to connect to each other and share knowledge (Ling, 2011).

The arguments for which of these factors that have the biggest influence on KM and which factor that is easiest to maintain differs. Uit Beijerse (2000) points out that within small and medium-sized companies the systems stands for a significant part in regards to managing knowledge. This is because the strategies are seldom clear, the organisational structure is not always well thought out, and the culture is obviously present but the most

difficult factor to influence (uit Beijerse, 2000). That technology has a significant influence on KM is also agreed by Hsieh et al. (2009). But according to Davies (2000) "*technology is only 20% of the solution [for KM], the rest is culture*" (Davies, 2000, p. 62). Despite this, Davies (2000) continues to argue that technology-based tools and organisational culture is closely linked together, due to that the use of technology both affects and is affected by the culture in the organisation.

3.4.3 Knowledge Process

The following chapter will discuss how the process of KM looks like in order to concretise what actually needs to be done. In the definition of KM it is stated that it is a process of "*creating, capturing and using knowledge to enhance organisational performance*" (Iandoli & Zollo, 2007, p. 7). This process can be divided into more detailed activities. The process breakdown varies a bit between different authors, but the process presented by APO (2009) contains the major steps in the knowledge creation and development process. These are: Identifying, Creating, Storing, Sharing and Applying, see Figure 7. APO (2009) states that by embedding this process into a company and making it into a collective and systematic process, it will foster continuous learning.

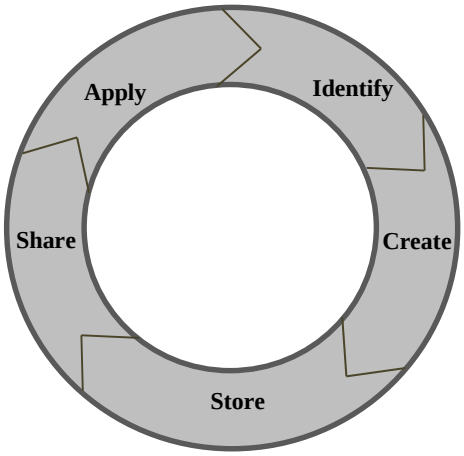

Figure 7. Knowledge process

For an organisation to be able to create and develop new knowledge it has to start with identifying what knowledge they have and what knowledge is needed to meet their goals. The difference in the existing knowledge and the required knowledge is what is called the knowledge gap, see Figure 8. To close the gap new knowledge need to be created. This can be done by for example turning to external sources or through internal brainstorming sessions. When the right knowledge has been created it has to be stored, the new knowledge has to be embedded into the organisation. This storage can be done through documentation if possible, but it is also important to make the people possessing the new knowledge accessible so that others can benefit from their tacit knowledge. For a company to then actually enable continuous learning the employees also have to share their knowledge. Knowledge can be shared through databases or through distribution of documents, but also through different types of interactions, such as through Socialization, Externalization, Combination, and Internalization presented in chapter *3.2.2 Knowledge Conversion*. This new knowledge will however only add value to the organisation if it is utilised in their business processes. It is first when the knowledge is applied within the

organisation it can be translated into action or decision making. (APO, 2009; Yip, Ng, & binti Din, 2012).

Another model, which is shared by a few different authors, was presented by Yip et al (2012) and contains the steps: Identification, Acquisition, Application, Sharing,

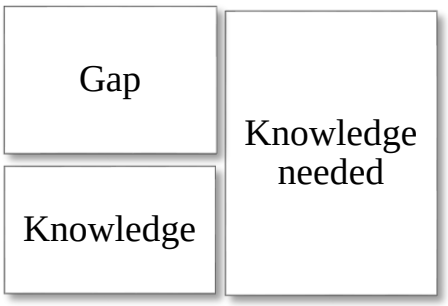

Figure 8. Knowledge gap

Development, Creation, Preservation and Measurement. There are only minor differences to this process compared to the one developed by APO such as they split the step of Knowledge creation into Acquisition, Development and Creation. Moreover, they also specifically stress the importance of generating knowledge relevant for the company, which is implicit in APOs process. Additionally, they also address the need to measure whether the new knowledge has had an impact on the organisation. (Yip, Ng, & binti Din, 2012)

3.4.4 Outcomes

Finally, the things which can be gained from doing these activities successfully will be presented in this section. If an organisation manages to implement Knowledge Management successfully there are a lot of benefits that can be gained. KPMG (2000) has in a study seen that the top three benefits gained are that companies achieve better decision making, faster response to key business issues, and they deliver a better customer service. They also list things as improved competitive advantage, profit and revenue growth, reduced costs, and the risk for reinventing the wheel decreases (KPMG, 2000). These benefits are also supported by Chong et al. (2006), who also listing identifying & sharing best practices and creation of new business opportunities as frequent outcomes (Chong, Wong, & Lin, 2006). Knowledge Management will also result in a "smarter" organisation since individuals, teams, and the organisation as such are continually learning and improving. (Senge, 1990)

3.5 Organisational Culture

As seen in chapter *3.4.2 Accelerators for Successful Knowledge Management* factors connected to the organisational culture are frequently mentioned. It is also stated that the organisational culture is an accelerator for KM which could stand for as much as 80% of the solution (Davies, 2000). Therefore this accelerator will be reviewed more thorough than the others. In the end, the thing that companies are striving for is the culture of a learning organisation, discussed earlier in the theoretical framework chapter.

A company culture could be viewed as the social glue that holds a company together, or as the informal rules and norms that steer the employees' behaviours. Anyhow, a culture is always present within a company. If the culture is weak or strong, good or bad; is more a question of how old the company is, the turnover of employees, if the organisation is a result of acquisition or geographical expansion, or if there is a misfit between the culture

within the company and the environment within which they act etc. If the organisation can make culture a positive force they may be able to create a good culture that fosters Knowledge Management and creates a learning organisation. (Baker, 1980)

According to Baker (1980): "*good cultures are characterised by norms and values supportive of excellence, teamwork, profitability, honesty, a customer service innovation, pride in one's work, and commitment to the organization. Most of all, they are supportive of adaptability – the capacity to thrive over the long run despite new technological developments, and the strains to growth.*" (Baker, 1980, p. 10)

What a good and ideal culture is varies depending on the company and its situation. For example, for small fast growing companies which act in new and growing industries, their key to a good culture may be norms that support fast growth. The opposite case, mature and slow-growing companies which are acting in highly competitive industries, norms based on cost-consciousness could be the key to good cultures. (Baker, 1980)

According to uit Beijerse (2000), culture is one of the most difficult things to manage within an organisation. Baker (1980) agrees and says that it is hard to manage culture, but it is easier within a young and growing organisations led by a strong entrepreneur. Over time when such a company grows larger it will become more difficult to manage the culture but it will also be more important (Baker, 1980). Whether it is a large or small organisation the key to manage the culture lies in the daily work not in annual big decisions and implementations (Baker, 1980).

4 KNOWLEDGE MANAGEMENT FRAMEWORK DEVELOPMENT

The previous chapter discussed theories related to Knowledge Management. The thesis will now move on to try and extract the most vital elements in order to combine them into a comprehensive framework which can be used by organisations wanting to easily have an overview of Knowledge Management, enabling for instance discussions concerning the subject.

Based on the theories presented in the previous chapter the authors searched for existing frameworks covering the different factors that was found to be important for successful Knowledge Management as well as which could be used as a guide for companies who wishes to discover the possibilities and requirements for it. It appeared that the majority of the frameworks found, only covered different pieces of the theories, for example only a few of the accelerators or only the knowledge process. One framework developed by the Asian Productivity Organization, APO, was however found to be a close approximation. It covers an organisation's vision and mission, some accelerators, and a knowledge process as well as outcomes, see Figure 9. APO's framework has its starting point in the understanding of the organisation's vision, mission, business goals and strategic direction, and thus places them in the centre of the framework. The four accelerators; People, Process, Technology and Leadership all have to be managed in a way that enables a successful knowledge process. The outcomes then show how effective the process is as a result of the accelerators, vision and mission. Through enhancing innovation and learning the organisation will build up the different capabilities which will lead to improvements in the quality, productivity, profitability and growth. (APO, 2010)

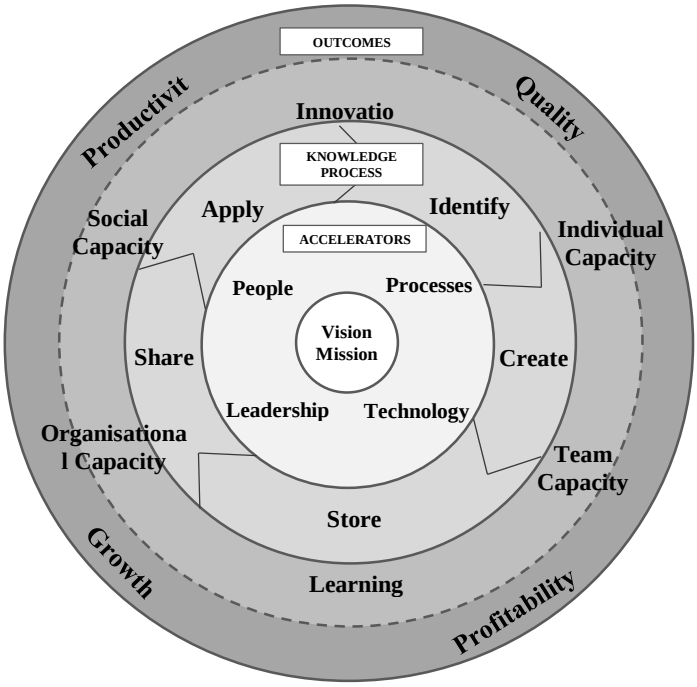

Figure 9: Knowledge Management Framework developed by APO

However, as this report suggests, there are also other elements which are important in the field of KM and although the framework presented above is a good approximation, it does not cover all the bases. With APO's framework as a base for inspiration the authors developed a new one, which covered a few other elements as well. To start with, the authors did not find the company's mission to have such significant influence on KM as

APO's framework intend, but the vision still seem to have a vital influence. In the theories examined, it was discussed that this vision needed to be shared among the employees and that they also shared an understanding and meaning for the reality in which the company operates. It has also been discovered that a shared meaning can replace the vision in some cases and often this is the case when a new entrepreneurial company is born. To have the same starting point, the core of an organisation, is important when knowledge should be managed.

Furthermore, in *3.4.2 Accelerators for Successful Knowledge Management*, four different combinations of accelerators were presented. As shown in Table 2 the theories more or less cover the same areas but they are expressed in different words. The authors found Uit Beijers's choice of phrasing the areas the most general and easiest to relate to, it also covered most of the other combinations of accelerators as well. However, Uit Beijers's accelerators did not cover leadership which have been found to be significant for successful KM. The accelerators could therefore be summarised into the five factors: Culture, Leadership, Strategy, Structure, and Systems.

	APO	**Uit Beijerse**	**Karabag**	**Ling**
Culture - Openness - Honesty - Adaptability - Commitment - Behaviour - Learning Org.	People	Culture	Culture	Culture
				Employee participation
Leadership - Supportive - Encouraging	Leadership		Management Support	Leadership
Strategy - How to reach the goals/vision		Strategy	Motivation aids	
Structure - Hierarchy - Responsibilities - Team-oriented		Structure		Organisational structure
Systems - Rules - Procedures - Work processes - Guidelines - IT-systems	Process	Systems	Systems and content quality	
	Technology			ICT

Table 2: Overview of accelerators

Depending on how the accelerators are managed, it will affect the process where knowledge is identified, created, and shared etc. The Knowledge Processes presented by APO covers the main steps (Identify, Create, Store, Share, and Apply) and the authors did not find any further benefits when splitting the process into more detailed steps. A more detailed process may only make the model more complicated, and thus lead to not being used in organisations. Furthermore, since the idea with the framework is to enable discussions, it is important that it is uncomplicated and generic enough to fit into most organisations. The processes will subsequently, based on successful management of the accelerators, hopefully lead to some positive outcomes. The outcomes in the developed framework are a combination of all theories covered in previous chapter. Here, generic

and specific outcomes are mixed together and the authors see no problem in them being quite a few to the number. Instead, it is important to communicate that there is a lot to be won by managing knowledge successfully although perhaps not all of the listed outcomes are achieved.

The newly developed KM Framework is presented in Figure 10 and is the one that will be used and tested in this thesis. In short, what the framework wants to show is which components that are important to consider when working with KM. Moreover, based on the way the framework is designed it could ease discussions of the subject. Starting at the top and moving down throughout the framework, one should cover each step presented and try to relate it to the own organisation. In other words, initially it is important that an organisation understands that it is through a shared vision and shared meaning that they can create cohesion in the company; something that makes everyone strive in the same direction. To both create a shared meaning and make it last, as well as to create a basis for an efficient knowledge process and in the end gain positive outcomes, the organisation has to manage its accelerators successfully.

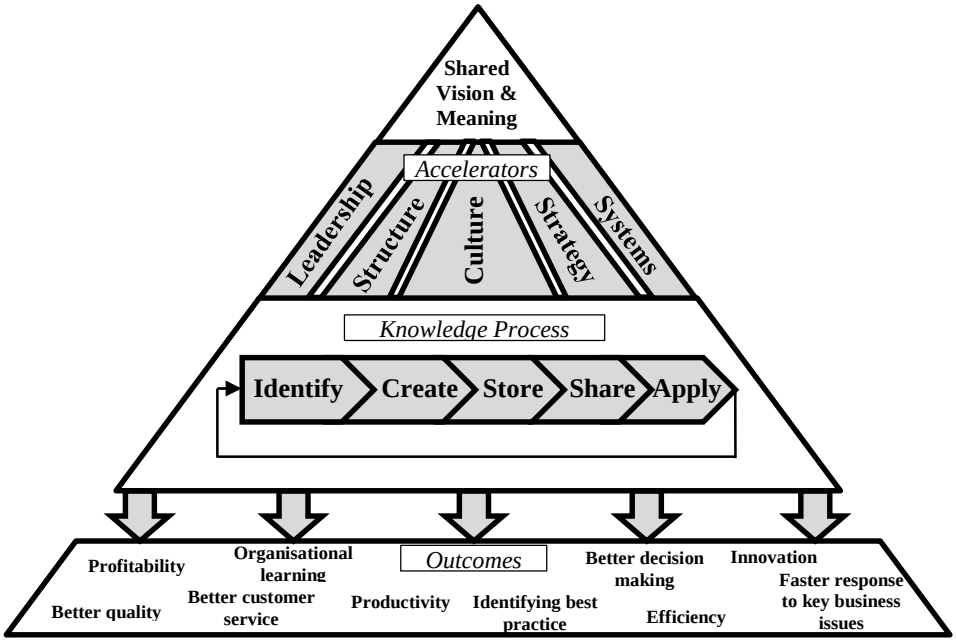

Figure 10: Developed Knowledge Management framework

5 KNOWLEDGE MANAGEMENT TOOLBOX

The modified framework presented in the previous chapter can be used as a guide for companies to get an overview of Knowledge Management and discover the possibilities and requirements for it. For a company to be able to succeed, the knowledge process and the accelerators have to be managed. In this section a toolbox will be presented that can be used in order to improve KM. As mentioned earlier, an essential part for successful KM lies in the business culture. The area will be covered indirectly in the first section of this chapter due to that many things are connected to it, but it will be discussed separately and more thoroughly in the chapter 5.10 Methods for Building the Wanted Culture. The initial focus will be on methods and tools, connected to the other accelerators, which can be used to foster and improve the knowledge creation, sharing and storing.

An overview of a few generally accepted methods and tools and which part of the KM Process and what accelerators they support can be found in the Table 3 below.

Methods and Tools	KM Process	Accelerator
Middle-up-down management	Creation	Leadership, Strategy, Structure
Creative chaos	Creation	Strategy, Culture
Redundancy	Creation	Systems
Communities of practice	Creation, Sharing, Storing	Structure, Strategy, Culture
Storytelling	Sharing	Systems, Culture
After action reviews	Creation, Sharing, Storing	Systems
Physical workspaces	Creation, Sharing	Systems, Culture
IT-tools	Sharing, Storing	Systems

Table 3. Overview of methods and tools to foster Knowledge Management

5.1 Middle-Up-Down Management

As a development of the traditional managerial structuring theory which basically states that an organisation is either top-down or bottom-up managed, Nonaka (1994) suggest a form of structure more suitable for the creation of knowledge. This is called middle-up-down management and is compared to the other two in Table 4. (Nonaka, 1994)

Middle-up-down focuses on both horizontal and vertical collaboration between the members of the organisation, rather than the sole vertical model. With this type of collaboration all parts of the company are responsible for creating new knowledge. There are however different roles and responsibilities when it comes to this area. The top managers are still in charge of creating a vision as to where the company shall head, as well as designing the deadlines which follows. These are then translated and further broken down by the middle-management and finally solved in groups. It is important that the vision does not become too similar to instructions. This is achieved by for instance leaving them open ended and subject to a variety of interpretations. (Nonaka, 1994)

Often it is the frontline employees and lower managers who are the experts in the current situation for the specific products or market, but they, being tasked very specifically, find it hard to turn this information into useful knowledge. This is where middle and top managers come in, their objective is to try and organise the sometimes chaotic situation to enable knowledge creation. Another aspect which separates the middle-up-down management style is that rather than relying on having a very charismatic leader, which is often required in the other modes, the top management has a more supportive role

instead, guiding the organisation in the right direction and functions more as a catalyst. In short, the frontline employees are tasked with knowing what the current state is while the top management needs to know what ought to be. (Nonaka, 1994)

	Top-down	Middle-up-down	Bottom-up
Agent of Knowledge creation	Top management	Self-organising team (with middle managers as team leaders)	Entrepreneurial individual (intrapreneur)
Resource allocation	Hierarchically	From diverse viewpoints	Self-organising principle
Pursued synergy	"synergy of money"	"synergy of knowledge"	"synergy of people"
Organisation	Big and powerful HQ. Staff use manuals	Team-oriented affiliated firms by intrapreneurs	Small HQ. self-organising sub organisations
Management Process	Leaders as commanders. Emphasis on information processing. Chaos not allowed	Leaders as catalysts. Create organisational knowledge. Create/amplify chaos/noise	Leaders as sponsors. Create personal information. Chaos/noise premised
Accumulated Knowledge	Explicit. Computerised/ documented	Explicit and tacit. Shared in diverse forms	Tacit incarnated in individuals
Weakness	High dependency on top management	Human exhaustion. Lack of overall control of the organisation	Time consuming. Difficult to coordinate individuals

Table 4. Comparison of different management approaches

5.2 Creative Chaos

Knowledge can be created when chaos occurs. It forces people to rearrange the usual state they are in. This can be used to an organisation's advantage. A creative chaos can be created with the help of fluctuation; the variations that can occur when an individual interact with its surrounding environment, when the person take into account things as ambiguity, noise, and randomness generated from the organisation. Creative chaos can also be generated naturally when the company faces a real "emergency". For instance this could be when the performance deteriorates or a competitor presents a new product or process which surpasses the own company's. By facing a situation never experienced before which requires knowledge not currently possessed, an organisation needs "*to create a new order of knowledge by making use of the fluctuation itself*" (Nonaka, 1994, p. 28). (Nonaka, 1994)

Hence, drawing upon this knowledge, organisational leaders have the ability to intentionally create such chaos by generating a sense of emergency among the employees by for instance setting up challenging objectives. However, there are a few prerequisites for a successful outcome of this strategy. Initially, reflection is an important cornerstone in the creative chaos, both in its structure and process, as it otherwise tends to form a destructive character. Furthermore, a solid problem definition ought to be available since these do not present themselves but have to be constructed from the existing knowledge. (Nonaka, 1994)

On the other hand, it is important to remember that when facing chaos due to for instance time restraints, there is also the possibility that it causes creativity to fail since people feel that they must rush. Also, by implementing fake or impossibly tight deadlines, one also

risks causing distrust among one's employees or even burnouts. (Teresa & Amabile, 1998)

5.3 Redundancy

Providing employees with information which is not essential to the employees daily routines may seem alien to many western managers, and especially if you consider the ideas of Frederick Taylor since it will link to the idea of an inefficient process (Wenger, 2004). However, for the processes of knowledge creation, "redundant" information can actually help speed up the process (Nonaka, 1994). For example; loosely linked steps in the product development process could mean that a greater speed can often be achieved as seen in for example many Japanese companies (Nonaka, 1994). However, one issue identified with this method is in the event that the design changes or other alterations take place, there is a risk for confusion (Nonaka, 1994).

Redundancy is often used in contexts where it describes something "extra", something which is not needed and therefore often desired to remove. However, if it is put in regards to the term reliability, the word is placed into a slightly different context. The analogue compass in a commercial aircraft or the way many of the words in this essay is constructed could be seen as redundant for instance and could in one sense be removed for weight/space saving or for making the essay faster to read. However, the compass is built into the aircraft in case there is a computer crash and all other systems fail respectively to ensure the reliability of the message in the essay goes through. (Landau, 1969)

5.3.1 Requisite Variety

With an increasing amount of information followed by the suggested use of redundant information, there is eventually an upcoming issue with too much information being provided, thus requiring a balance between the creation process and information delivered. This leads into another topic suggested by Nonaka (1994), Requisite Variety. He bases his ideas on those of Ashby (1956) who argues that the diversity of information provided should be in relation to the information load required by the environment. In essence, this refers to the issue of having information stored at the correct location within the company, accessible to everyone whom it may concern with the least amount of steps necessary. This requires the employees to know who owns what information as well as be related to as few colleagues as possible, preventing an overload of information.

5.4 Communities of Practice

Wenger (2004) argues that the main cornerstone of Knowledge Management is Communities of Practice. The main reason for this is because the very knowledge that one is trying to manage is within the people who work in the organisation, the practitioners (see chapter *5.1 Middle-Down-Up Management*). These are the ones who know which knowledge that is worth to, for instance, document, and which can be left as tacit understanding. However, one important aspect is once again communication; the practitioners need to interact with others, forming communities where Knowledge Management is possible. According to Wenger (2004) "*Communities of practice are groups of people who share a passion for something that they know how to do, and who interact regularly in order to learn how to do it better.*" (Wenger, 2004, p. 2). (Wenger, 2004)

Another important aspect is the role of the executives. Their role is not to manage knowledge directly, but rather to create an environment that enables it. This does not

mean however that the communities can solve everything by themselves; a continuous dialogue with the management is required. Moreover, communication with other communities and experts outside the own organisation is important; hence the responsibility for Knowledge Management becomes something that is shared between these instances. Communities of practice are not a top-down process, nor a bottom-up one, it is both. (Wenger, 2004)

According to Wenger (2004), a community of practice consists of three elements. Initially, there is the Domain or the area of knowledge in focus. Secondly, there is the Community or the group of people in the specific domain. Note that this is not just a library website, the group members need to have a relationship between and interact with each other. Finally, there is the Practice, the things that the community produce and use in the domain. This could be anything between documents to specific methods and tools. (Wenger, 2004)

5.5 Storytelling

The importance of company culture has been extensively discussed. However, it is not obvious how a manager can create the desired environment; enabling for instance successful Knowledge Management. One tool for influencing the behaviour of people is storytelling or strategic narratives as it is sometimes referred to.

Storytelling is a powerful tool for organisational change. It is commonly thought of as the natural way to make change happen within an organisation is to explain the reasons behind it. The people who are affected by the change, and being rational beings, would then weigh in the factors present as well as statements provided and, given that they seem preferable, would accept the change and go along with what is suggested. However, this might not be so true at all in most cases. In general, employees do not like being told what to do, and have a harder time accepting the changes when the ideas of the future state goes from a speaker to a listener. This is still however the method described by several leading management books according to Denning (2001). An alternative is to use stories to convey the message. By choosing the right stories and by telling them in such a way that people start to relate the stories to their own experiences even though it may not have anything to do with them, could prove to be a more prevailing technique for making change happen. The people who are affected by the change start to put themselves in the position of the story and come up with own ideas how to act and thus, instead of being the speaker's ideas, it becomes the listener's. (Denning, 2001)

Stories are helpful for learning new things and for imagining the course of different actions. It allows people to see their role in the change that needs to happen. One company who have used storytelling extensively and successfully is 3M, the company which amongst other things invented the Post-It Notes. They use it to clarify the idea behind the plans that they make as well as to encourage people to work. While there are many things which are good with using bullet points, they fail to deliver on the details how to achieve them, their interrelations and sometimes give the false impression of clarity. (Shaw, Brown, & Bromiley, 1998)

The most effective stories are usually about a single hero or heroine which is in a situation commonly found within the organisation and that the employees can identify themselves with. Furthermore, the story requires a certain amount of omitted details, as well as to be relatively simple, but still be plausible. It makes it easier for the people whom one are trying to change to imagine themselves in this situation and to embrace the message of

the story. Finally, it is best if the story ends on a positive note minimising the "leap" required for the receiver to imagine the possibilities. (Denning, 2001)

It seems then, that it is the stories that are told which determine the culture of the company. An example would be an organisation who decides to tell a story about an employee who worked in product development. The employee was told to drop a project he/she had been working on for quite some time since the management did not believe in it, but the developer went ahead and completed the project anyway on his/her spare time. The project then turned out successfully and the developer received a lot of praise for it. The message in this story is, that sometimes it is worth going against what your leader says, and by telling this story; this message is conveyed to the rest of the organisation.

5.6 After Action Reviews

In order to maximize the impact of knowledge sharing, it has to be done as soon as possible after new knowledge is created; preferably right after a project, mission or other critical activity is finished (Garvin, Edmondson, & Gino, 2008). Because employees constantly improve the way they work through learning from mistakes, receiving new ideas, or by customer feedback; it is desirable that this new knowledge is distributed to the rest of the organisation (Wenger, 2004). One way of doing so, is by using a renowned tool called the After Action Review (AAR) after the completion of a project or corresponding activity (Wenger, 2004). The AAR has its roots in the US Army and is a method used to capture the lessons learned after a completed project and is used today by many companies (Garvin, Edmondson, & Gino, 2008). The basis for the AAR is to answer four questions: What did we set out to do? What actually happened? Why did it happen? What do we do next time? (Garvin, Edmondson, & Gino, 2008; U.S. Army, 2011).

Originally, the AAR was designed for giving instantaneous and standardised feedback to soldiers of the US army after a training exercise in order to provide feedback and allowing correction in further trainings. The idea is that the soldiers would discover themselves what happened and come up with strategies for improvement. The review can either be formal or informal but in any case require extensive planning and preparation. This method involves creating an environment of trust and collaboration amongst its participants and it is therefore vital that it does not become a situation where only critique is handed out. Furthermore, it is important that everyone who took part in the exercise or can learn from it participates in the discussions and that the AAR does not grade success or failure. During the review, the leader's role is to ensure that everyone understands that you are allowed to disagree, regardless of position (or rank in the military), that the focus is on learning new things which can only be done if honest opinions are shared. Moreover, he or she should only enter the discussion when necessary and then use open-ended and leading questions to direct the discussion. After the review is finished, the leader summarises key ideas stated during the session and ends on a preferably positive note, and then leaves; allowing team members to privately discuss the reviewed exercise. (U.S. Army, 2011)

5.7 Physical Workspaces

The collaborative physical workplace is the setting in which humans work, in other words where interactions take place. The physical workspace can therefore be viewed as a tool that supports knowledge sharing and creation if it is well-designed. (APO, 2010)

When designing the office environment it is important to think about what kind of culture the organisation wants to achieve. When designing the office environment it is important to think about what kind of culture the organisation wants to achieve because the office environment can either rise or depress the moral of the employees. This in turn can then affect how well the organisation functions. (Turner & Meyerson, 2000)

To be able design a workspace that support knowledge sharing and creation first one have to understand how people interact and the diversity of activities within the company (APO, 2010; Nordic Innovation Centre, 2007). There are a few different parameters that affect peoples' interaction with each other, these are proximity, movement among colleagues, and possibility for chance encounters (Nordic Innovation Centre, 2007).

One way to impact the distance between colleagues, or minimize the chance that a colleague is perceived as distant, is to modify the visibility and accessibility in the workspace. By increasing the visibility one can create a feeling of presence among the colleagues. Visibility is easily created with open areas, which has its drawbacks regarding increased distraction, but the visibility as such can ease these downsides through creating an understanding for the noise. Overhearing others' conversations, intentionally or accidentally, creates an opportunity for spontaneous interactions. (Nordic Innovation Centre, 2007)

The movement of employees is affected by the paths created by walls, corridors, entrances and stairwells etc. This movement can then be modified through elements such as printers, coffee-machines and restrooms. Depending on the design of the workspace the movement of employees can either facilitate or prevent chance encounters, and through that affect the knowledge sharing and creation. (Nordic Innovation Centre, 2007)

What kind of workspace setting that is optimal for an organisation depends on, as mentioned above, what kind of interactions that take place and is needed within the organisation (APO, 2010). This means that there may be a need for different kinds of workplaces within the organisations work environment to suit different people and teams (Armstrong, 2012).

Firstly, there is the individual workspace, should it be provided in an open environment or in a cellular office, both has its pros and cons. Open workspaces promote flexibility and knowledge sharing to a higher degree than cellular offices but on the other hand open spaces will become noisier. (Nordic Innovation Centre, 2007)

Secondly, there are the spaces in which people collaborate and share knowledge, formally or informally. This can be meeting rooms of different kind or open areas with facilities such as coffee machines, snacks, magazines, printers etc. In meeting rooms it is important to think about what the room will be used for; collaborative teamwork and/or just for informing a group of people. What kind of facilities is needed; chairs and tables, whiteboards, IT, and communication equipment, etc. (APO, 2010)

5.8 IT-Tools

There are also different IT-tools that can be used to foster knowledge creation and sharing as well as tools for storing knowledge. Almost all tools can either be found freely or as expensive proprietary software. The choice of software depends on the needs of the organisation. (APO, 2010). Below, short descriptions about a few different IT-tools that can be used are presented.

Document Libraries. A system where organisations can store and search for information can be called document libraries. If the documents are well-organised, categorised and

named in a good way it will ease the process of filing, searching and finding the right information at the right time. Efficient and effective access to documents will prevent information overload. (APO, 2010)

Knowledge Base. This is a database which is maintained together within a group, a team or an organisation. It is a way for employees to create new knowledge, collaborate, develop knowledge, access new knowledge, give feedback, and edit knowledge in an efficient way. Knowledge bases should be created around knowledge that is considered as critical for the organisation; it is not about externalising and codifying as much knowledge as possible. (APO, 2010)

Knowledge Portal. Information Portals are something that companies can use as gateways to codified and digital information and these are usually held in documents and databases. Based on this Information Portal companies can build a portal for knowledge. Information remains as a flow of messages until the reader processes it and integrates it into his/her tacit knowledge. To speed up the learning process and build a more effective transfer between explicit and tacit knowledge a Knowledge Portal can be used. A Knowledge Portal contains structured information, knowledge networks and communities, discussion forums, collaborative workplaces as well as it can contain an expert locator. All these attributes encourage to better exchange of tacit knowledge. (APO, 2010)

Conference Phones and Video Conference Technology. Tools that may seem obvious in today's society are conference phones and video conference technology. With this kind of equipment geographical distances between people, offices or companies are not a problem. People can talk to each other regardless location, provided that there is an internet or phone connection. When combining for example video calls and screen sharing people will get a richer form of communication and a high level of interaction which is good for knowledge creation, sharing and storing. (APO, 2010)

5.9 Methods for Building the Wanted Culture

Managing and changing a company culture can be hard. To be able to change it in the right direction it is important to first analyse the current culture and find out what kind of culture that is needed and appropriate for the particular company (Baker, 1980; Alvesson, 2002). The gap between current and desired culture then must be closed. (Baker, 1980; Alvesson, 2002).

Both Baker (1980) and Alvesson (2002) lists a few different methods that can be used to close the gap between current and wanted culture and also highlights the importance of using a few different techniques in combination to implement the change more effectively.

According to Baker (1980) Role Modelling is the technique that affects a culture the most. This means that managers behave in a way that they want the rest of the organisation to do. Another technique is Performance Appraisal Systems, which means that when employees behave in way that foster the desired culture they will be rewarded and encouraged (Alvesson, 2002; Baker, 1980). Communication is also a technique through which management can articulate the values and norms wanted. This could be done verbally, through actions or through written arrangements. (Alvesson, 2002; Baker, 1980)

An organisational culture can also be managed through indirect techniques (Baker, 1980). This could for example be through recruitment, by hiring people that support the desired culture (Alvesson, 2002; Baker, 1980) or through promoting or transferring employees that behave in a desired way (Alvesson, 2002). Through organisational symbols, such as

a certain language (slogans, expressions and stories), actions (e.g. the use of meetings) and material objects (logotypes or dress codes); employees can be shaped to behave as wanted (Alvesson, 2002). Even the physical design of the work environment can affect peoples' behaviour. (Baker, 1980).

The techniques listed above are examples for how to manage a culture as such. If instead turning the focus to how to create a culture that emphasise learning, Gill (1998) brings up five things that can help building the structure for a learning organisation. Firstly, communicate openly and honestly, without distorting any information. Secondly, show confidence in employees' abilities, treating them as skilled and competent. Thirdly, listen to and value what employees say, even though the management may not agree. Fourthly, keep promises and commitments at all times. Finally, cooperate with the staff and look for ways for how they could help each other.

Du Plessis et al. (1999) continues to argue that through building a learning organisation one fosters collective learning and unleashes individual creativity, the process of generating new and more effective/efficient methods and routines. In other words, the organisation is getting smarter through planned and systematic learning that are aligned with the organisation's strategic goals (du Plessis, du Plessis, & Millett, 1999).

5.9.1 How to Foster Creativity

Creativity is perhaps the prime tool used for knowledge creation, and thus used for ensuring that knowledge is fostered throughout the organisation. Du Plessis et al. (1999) mentions in their article that through creating a learning organisation, one also fosters individual creativity. Amabile (1998) has another approach to the subject and describes how creativity is a function of the three components: Expertise, Motivation and the ability to put existing information and ideas together in new combinations to find solutions to different kinds of problems.

Expertise includes all the knowledge a person possess and everything he or she can do within the field of his/her work. How the expertise is acquired does not matter, it can be through formal education, practical experience or through interaction with other professionals. Furthermore, even if a person has a great expertise within a certain area and is able to combine existing information to create new solutions; the person may not do his/her work properly; the creativity may be killed, due to lack of motivation. (Amabile, 1998)

There are two forms of motivation, Extrinsic and Intrinsic. Extrinsic motivation is external factor such as a reward in form of for instance money or threats of getting fired. This kind of motivation can make people feel bribed or controlled which necessary does not stop people from being creative but it does not help either. Intrinsic motivation on the other hand, has shown to have a big influence on peoples' creativity. This motivation is based on a person's internal desire to do something, a passion and an interest. When people are intrinsically motivated they will be engaged to the work because of the challenge and enjoyment they get from it. Amabile (1998) summarises this in what she calls the Intrinsic Motivation Principle of Creativity*;* "*People will be most creative when they feel motivated primarily by the interest, satisfaction, and challenge of the work itself – and not by external pressures*" (Amabile, 1998, p. 79). (Amabile, 1998)

What can management do to improve creativity? Amabile (1998) divide managerial practices that affect creativity into six categories: Challenge, Freedom, Resources, Work-group Features, Supervisory Encouragement and Organisational Support.

Challenge. For employees to develop their skills their abilities have to be stretched; they have to be challenged. For the managers this means matching the right person with the right tasks so that it stretches the employee's abilities to the right point. How much the employee's ability should be stretched is crucial. Too little and they will most likely feel bored, while too much will make them feel overwhelmed and they will have a feeling of losing control. (Amabile, 1998)

Freedom. Management should give the employees the freedom to decide upon what methods to use but not necessary freedom concerning the ends. As Amabile (1998) describes it "*creativity thrives when managers let people decide how to climb a mountain; they needn't, however, let employees choose which one.*" (Amabile, 1998, p. 81) This means that through specified strategic goals peoples' creativity can be improved. But it is important that the goals are clear to the organisation is stable for a meaningful period of time. Freedom around processes gives employees a feeling of ownership and it fosters the intrinsic motivation because they can then approach problems in a way that makes the most of their expertise and skills. (Amabile, 1998)

Resources. The resources that affect creativity the most are time and money. In the same way management have to match the right people to the right tasks, they have to match the right amount of time and money to a team or project. When it comes to time, for example, fake deadlines or tight deadlines can lead to distrust or cause stress and too much time can lead to that the people in the project gets lazy. The same goes for money, a too tight budget will push people to use their creativity to find additional funding instead of solving the problem. Too much money has shown to not boost creativity either. (Amabile, 1998)

Work-group Features. Putting together a well-functioning and creative team can be difficult. The team has to be mutually supportive and the members should have a diversity of perspectives and backgrounds. Except diversity, three other features are important. Firstly, the members have to have a shared excitement over the team's goals. Secondly, the members have to show a willingness to help each other through difficult periods. And thirdly, the members have to be aware of the unique knowledge and perspectives that each member bring to the group. If all these factors are in place, Amabile (1988) suggests that creativity will be fostered. A homogeneous team on the other hand, will most likely solve the problems faster with less friction within the group. But the group will not improve its expertise and creative-thinking. (Amabile, 1998)

Supervisory Encouragement. To keep up employees' creativity and passion for his/her work they have to be encouraged. Most people feel that it is important that their work matters to the organisation and if people are encouraged for the work they do they will most likely keep on doing it in a satisfying way. For managers it is important to recognise creative work done by individuals and teams before a commercial impact. It is therefore important for managers to listen to and evaluate employees' ideas and not neglect them directly. Another way for managers to support creativity is through role modelling as described previously. If they can be persistent through tough problems and encouraged collaboration and communication within teams, they will be able to enhance creativity within the organisation. (Amabile, 1998)

Organisational Support. If the organisation's leaders implement systems and procedures to enhance creativity it will be clear to all employees that creative effort is a priority. It is also important that the organisation's leaders support information sharing and collaboration as well as make sure that political problems not get a hold of the organisation. If the organisation manages to support information sharing and

collaboration it will enhance expertise, intrinsic motivation as well as the skills required to combine different sources of existing knowledge into new solutions. (Amabile, 1998)

For an organisation to have a creative culture is a great competitive factor. But if the creativity is killed it will be harder to produce innovative ideas and it can also bring down the employees' commitment to their work. It is therefore in the hands of management to think about how they design the work environment, there may be a need for a culture change. (Amabile, 1998)

5.9.2 Self-Organising Teams

Another way to support creativity and a learning organisation is through Self-Organising Teams. Self-organising teams emerges spontaneously around a specific issue or an activity that motivates people to take action and form an informal and temporary team that usually are not part of the structure. In these teams there is strong sense of shared purpose and personal commitment. The teams are communicating and cooperating until they reach an agreement and can make a response to the issue. (Anderson & McMillan, 2003)

Due to that the self-organising teams come into existence spontaneously they cannot be controlled, but they can be supported and/or influenced. This means that a manager could never create self-organisation but through providing the right conditions it can emerge. Through managing the five factors that have been identified as prerequisites for self-organisation one can improve the possibility to success as well as support a creative and learning organisation. The five prerequisites are presented below. (Marmgren & Ragnarsson, 2001)

Rate of Information Flow. There is a need for a balance in the amount of information that is transferred and shared between the team members, not too much and not too little. Projects are in many cases organised into subprojects. When this happens the interdependencies between the subgroups are often minimized, but this also creates a bigger need for communication to overcome the uncertainties in the project. This inherent need for communication will support self-organisation. To support the communication effectively it is important that the team members regularly have the possibility to meet face to face, even though the use of email and telephones can support communication to some extent. (Marmgren & Ragnarsson, 2001)

Degree of Diversity. For a group to be creative the members need to have different backgrounds, competences and personalities. However, too much diversity in the group will cause communication problems. The goal is to create a culture in which all members' thoughts can be expressed and respected, and become the base for new innovative ideas. (Marmgren & Ragnarsson, 2001)

Richness of Connectivity. If the team members have the opportunity to build on each other's contributions they can create innovative ideas and in the end arrive at a common solution. To make this happen the members need to show respect for each other. To foster creativity the climate must allow both the obvious and the stupid thoughts to be expressed without a risk of being ridiculed. A creative climate also need to be based on trust and a common understanding among the team members regarding what should be achieved. (Marmgren & Ragnarsson, 2001)

Level of Contained Anxiety. In a creative group the members should be able to handle the anxiety that can occur when stuck and when progress seems unlikely. The group should be able to stay in the stat of anxiety until something new emerges, and not close down the project which often is the result. Factors that influences if the group manages to contain

anxiety are trust and the company culture. If the company has a culture that does not allow mistakes or being wrong it will be hard to stay calm in the middle of a creative chaos. If this is not the case the project leader still has to tolerate the uncertainty when the group working at the edge of chaos. The project leader also has a difficult task in distinguish between if the group working towards a creative or destructive chaos. (Marmgren & Ragnarsson, 2001)

Degree of Power Differential. In hierarchical organisations the leaders' power is often increased with a higher position. In these situations it can often be hard to achieve an open exchange of information. Same situation can occur if someone in the group has a very specific area of expertise. A statement from a leader or an expert can close the discussion and kill creativity since that no one dare to question what is being said. In a project within an organisation where power differentials of different kinds exist, through formal education or level of authority; it is important that the project leader thinks about how he/she handles his/her authority. (Marmgren & Ragnarsson, 2001)

These ideas regarding prerequisites for self-organising teams are partly shared by Nonaka (1994). He states that to be able to create new knowledge the group first need to ensure that there is a mutual trust among the members. This is primarily done through sharing experiences through repeated, time-consuming dialogues, which also gives the team members common perspectives. (Nonaka, 1994)

6 EMPIRICAL FINDINGS

Through interviews and observations, empirical material has been collected. In this chapter the findings will be presented in a structure based on the Knowledge Management Framework. It will therefore start with the core; the company's Vision, but here presented in combination with the Strategy due to that they are closely linked together. Subsequently, the findings connected to the other accelerators; Culture, Structure, and System will be presented. The chapter ends with a section regarding the company's Knowledge Process. The chapter aims to give the reader an understanding for how the company functions today with focus on Knowledge Management.

6.1 Vision and Strategy

Stena Renewable's business idea to build and operate wind turbines with a goal of building up to 40 new turbines every year, is well known among the employees even though only a few knew exactly how it was formulated in the business plan. The same goes for the company's vision of becoming a leading player on the Swedish market. Based on the organisation's vision, a business strategy is elaborated, which is also expressed in the business plan. But in the case of Knowledge Management, Stena Renewable does not have any explicit strategy worked out. However, some of their strategic choices in other areas actually foster KM in an effective way, more about this in the following sections.

Moreover, when the employees instead were asked to describe the company's values (Sustainability, Effective & Efficient, and Respect) almost no one knew what they were. However, almost everyone still managed to express the values their own words. Things that were brought up during the interviews were for instance how much they care for people, especially when it comes to people that are affected by the wind turbines. This respect for people has been confirmed through calls from different stakeholders who really appreciate that they make an effort and are listening to what they have to say. Efficiency and effectiveness were brought up a few times in connection to decision making processes, a flat organisation and that the employees are driven to do a good job. The last value, sustainable, was not brought up so many times during the interviews. But as one employee expressed it "*It is hard to not think sustainable when working with wind power*", and referred to both wind power as a renewable power resource and to building and maintaining the wind turbines.

In other words, Stena Renewable's values pervade the organisation even if the employees seem to not be aware of it. Something that instead, based on observation, seem to shape the company even more is the employees shared meaning and genuine interest for wind power and for how the company's production is going. An example of this is that some of the employees can easily check the wind application on their mobile phones on a Friday night together with a glass of wine. All employees seem to share understanding for the company's work and even if they are involved in it in different ways they share a language that makes it possible to discuss wind power and communicate around it.

6.2 Organisational Culture

As mentioned above the organisation seems to be shaped by a shared meaning and understanding for the company and its work. This meaning is most likely what have laid the basis for the existing culture and for the way they are working, it keeps the company together. From both interviews and observations it has been perceived that the culture is familiar, welcoming and open. Stena Renewable care about their employees and everyone

seems to like their jobs and the industry they work in. As one employee expressed it "*Very dedicated and driven people, they really believe in wind power*".

This dedication and engagement among the employees may be the reason for the company's efficiency in their daily work. It seems like everyone strives forward, towards the same goal, and are not afraid to help each other out. One can say that Stena Renewable is permeated by a "we-feeling". Problems and mistakes are met with "how do **we** solve this?" while if an employee has done something satisfactory him/herself the person is individually appreciated for its performance. This "we-feeling" is also visible through the way the employees communicate with each other about things that happens. The employees expressed that they want to share information and knowledge, and as one employee put it "*you don't dare hold on to information*".

The organisation is generally open-minded and there is room for new ideas as long as one has good arguments for them. The employees point out the importance of the open dialog that exists within the organisation which gives everyone the opportunity to express their opinions in both minor and major questions. This openness to new ideas and that the CEO strives towards creating a creative environment may be a result of that the company's entrepreneurial history. The CEO stated that he wants the employee to feel free to solve things in the way they think is the most suitable, he wants them to be creative and not locked in by checklists of different kinds. Due to that the company is relatively young there are no real traditions or fixed ways of doing things, so today the creativity is for example shown through how they continuously try to find best practices within the different departments. They try out new ways of working and new strategies, and if it does not work as intended the process or strategy is reverted to the previous one. If looking at the project department, which is the oldest part of the company, this has progressed for some time already, resulting in a fairly developed "best practise" model for constructing new wind parks. On the other hand, the operations department has quite recently begun to operate and take care of the turbines which mean that a lot of work is still to be done in order to try and optimise the processes. Stena Renewable's creativity is also shown in the way the company has to adapt and learn based on changing conditions, such as new laws and other external factors. They are acting in a relatively young industry where things are changing fast and they cannot afford not actively shaping and adapting the company to fit into this reality. This means that they always have to learn to be able to move forward and get closer to their vision. Furthermore, they are strongly influenced by things they cannot directly affect, such as the global price of coal.

Based on observations, it seems like Renewable's work environment also contribute to their familiar culture and that everyone want to and can share information in an easy way. They have several offices designed with glass walls and doors. All employees have their own office but everyone is working mainly with their doors open which creates a relatively open environment where the employees can hear and see each other. They also have four different meeting rooms all equipped with big screens and whiteboards which enables the use of different communication methods. There is also a common area which is located in the middle of the office. This area contains kitchen facilities, a coffee machine as well as a TV screen which shows live updates of the company's production (more about this screen in chapter *6.5.4 IT-tools*)

6.3 Organisational Structure

Stena Renewable is an independent company under Stena Adactum which is a part of the Stena Group. As a part of Stena Group, Stena Renewable benefits from using the Group's common HR and IT departments. This together with the choice of using consultants for

things as wind and sound measurements etc. makes it possible for the company to focus on their core activities, project and operate wind turbines as well as electricity trading.

Stena Renewable has 13 employees whose background is relatively similar. Almost all of them have a university degree, but within different areas. The employees' previous experience varies a bit, from project leaders within infrastructure to electricity trading and some have built wind turbines before while a few are presently leading their first wind power projects.

The employees are structured into what could be view as three distinct departments (their core activities), Project Management, Operation, and Electricity Trading. In addition to these there are the support functions; Finance and Administration. A full organisation chart can be found in Figure 11. Due to that the company is small the hierarchy automatically becomes relatively flat. A feeling of a flat hierarchy is also affected by the delegated business acumen which pervades the organisation. The flat organisation also leads to that the decision making process is relatively fast. It was however in one interview addressed that the flat organisation leads to that almost everyone wants to participate in the decision making and provide input which sometimes can delay the process.

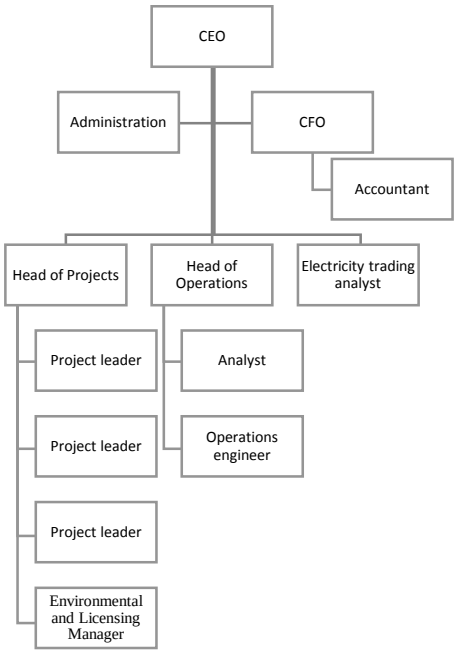

Figure 11. Organisation chart for Stena Renewable

The employees work relatively independently, the project leaders are owners of their own project and they do a lot of their work themselves. Within the operations department, the employees are responsible for different tasks. Even if this is the case there is a team-oriented feeling within the organisation. The analysts support the projects with information when needed and the Environmental and Licensing Manager are always involved in the different projects. So in some sense it can look like there is a team connected to each project, with members from all three departments.

6.4 Leadership

Even if Stena Renewable is a young company, the organisation has already changed from being entrepreneurial to becoming more industrialised. This change has also affected the

leadership. When the company started they were only two employees which resulted in that they had to do everything themselves. As the company grew in number of employees it had to change and the original members started delegating tasks to a greater extent. The leadership can today be viewed as supportive, where the employees are encouraged to share knowledge and information both horizontally and vertically in the organisation. As mentioned earlier, the leadership also relies on individual appreciation and motivation. Furthermore, as the company grew bigger they also had to adapt to the guidelines regarding leadership and responsibilities form Stena Group; all companies should be built upon delegated business acumen. The CEO explained this as all employees receive a lot of responsibility and are more or less owners of their own work. One example of this is that the project leaders are owners of their projects, and have the freedom to solve problems in the way they think is most suitable.

6.5 Systems

When looking at systems, such as procedures, guidelines and instruments, which are in place at Stena Renewable, one can identify relatively clear work processes within the project and operations departments. They also have structures for reports and meetings, as well as a few IT- tools that the employees think works well for the company.

6.5.1 Work Procedures

Stena Renewable's work process from project to operation of the wind turbines is approximately five years. It is a long process where a lot of communication with municipalities, county councils, and the people and associations in the area around the wind turbines is required. It could be quite a daunting task for someone who has never completed such a project before. This is why the way projects should be handled, what documents and agreements that are necessary, and in what order they are needed to be performed have started to be mapped out by the experienced project managers. The idea is to once this mapping is done; create some sort of a checklist that will serve as a guide.

Throughout the project phase they have consultations with the general public in the area surrounding the place where they plan to build new wind turbines. These consultations are held primarily to inform and answer questions about wind power, but it is also an opportunity to collect different opinions from those who might be affected by the turbines. Stena Renewable state that they try to meet all opinions with respect and are discussing and reviewing them in order to find solutions that can make as many stakeholders as possible satisfied.

During projects, and specifically during the meetings with municipalities and county councils etc., the company always try to send both a more junior project leader as well as a senior project leader for support. By sending two project leaders to these kinds of meetings, Stena Renewable believe they can create a faster and more efficient transfer of knowledge from the senior to the junior project leaders. This approach also increases the reliability towards the other participants in the meeting

When the projects are finished, in essence when the wind turbines are constructed ready for operation, it is time for the operations department to take over. This handover process could, according to the employees, be much more structured. They do have a formal meeting where they confirm whether all required documentation is available or not. Most often however, there are still a few things missing which leads to a small overlap in the departments' processes until it is sorted out. Another detail is that during this handover process the right documentation also needs to be copied over from project's folder on the

server to operation's folder. However, a problem that has been identified is since they do not know who is responsible for transferring the documents and because they do not find their way in the other department's folder, all of the correct documentation is seldom transferred at the specified time.

Furthermore, the information, knowledge, and lessons learned gained from projects are today not summarised and reviewed in a formal way. This is also an issue that the employees expressed themselves during the interviews; they sought a way to capture lessons learned. Something else which was also discussed during the interviews was the fact that even though they presently do not have a formal way of reflecting upon their gained knowledge as well as continually challenging the facts and ways of doing things. They still aim to improve their processes in order to be more efficient and effective, especially since suggestions for improvements always are welcomed and discussed.

It does seem also, that projects are not always running smoothly from beginning to end. Due to that all of the projects need to be approved by municipalities, county councils, and the environmental court, it can take some time to receive the green light and start building the wind turbines. Occasionally, the project might even be stuck in the process for long periods of time. For this reason, Stena Renewable tries to run a few different projects in simultaneously, thus the project leaders are responsible for more than one project at a time.

6.5.2 Report Structure

The reporting structure at Stena Renewable can be divided into two types, one informal and one formal. The informal part is based on the daily conversations that the employees have with each other. The relatively small office makes it easy to go in to another colleague's office to inform about necessary topics, this kind of informing also frequently takes place around the coffee machine. It can be viewed upon as an event driven type of reporting which means that it takes place whenever it is needed and it is largely based on the employees will to share information, as one employee put it "*you don't dare hold on to information*".

The formal reporting is based on a few different written reports that are done on a more or less regular basis. An overview of the different reports is found in the Table 4 below.

Type of report	Content	Who reads it/gets it
Weekly Reports	- electricity prices - production	- sent to everyone through email - everyone reads it
Monthly/Quarterly Reports	- financial report - electricity prices - production	- sent to everyone through email - everyone reads it
Operations Inform	- status updates for what is going on in the wind power plants - problems and successes	- written when necessary and sent to everyone through email - everyone reads it
Operations Report	- detailed reports regarding operations work - reports regarding turbines etc	- internal report for operations
Project Report	- status update for the projects - found in different versions	- internal report for project
Meeting Notes	- short notes are taken at management meetings, project meetings, monthly meetings	- for internal use only - can be found at the server

Table 5. Overview of reports used within Stena Renewable

The employees seem to be generally pleased with the report structure which is currently present. There is however a wish from some employees, not connected to the project department, to receive status updates regarding what is happening within the different projects. Important to note however is that this is mostly out of pure interest and not that they want to influence the projects' development in any way.

Finally, the organisation subscribes to a few different external reports with information and analyses regarding for instance the market and electricity prices. These reports are available for all of the employees to read if they so desire, which many do read them out of own personal interest.

6.5.3 Meetings

Stena Renewable has a few different types of meetings that take place on regular bases. Every second week, they have a management meeting. Attending in this meeting are the CEO, the Financial Manager, the Project Manager, and the Operations Manager. For the meeting they try to keep the same agenda every time and the group discusses the organisation and business development, current projects, how the operations are going and from financial aspects. The CEO explained the meeting as: "*it is a chance to discuss relevant topics while the monthly meeting is more for debriefing"*. The monthly meeting is for all employees and is, again as the CEO explained it, mainly for debriefing. There is however room for shorter discussions if needed. The management meetings are in other words where the individual knowledge is brought up to the next level, where it can be discussed and also lay as the base for new ideas. These ideas are then brought to the monthly meeting to share which causes a knowledge transfer to the whole organisation or they are discussed during meetings in the separate departments.

Within the project department the project manager, the three project leaders, and the environmental and licensing manager meet regularly for a project meeting every second week. This meeting is a discussion forum with a pre-set agenda of topics to discuss. In every second of these meetings, one of the analysts attends in order for everyone taking part to have a more thorough discussion concerning wind resources. Project meetings are

held to give the project team a good understanding and overview of the different projects and the status for them. It is also an opportunity to share learnings and outcomes as well as to discuss different problems that someone is facing or which might arise in the future. Within these meetings, the individuals can once again contribute to the group with their own knowledge as well as for each employee to gain new individual knowledge.

In addition to these three pre-set meetings which are being held on a regular basis, the employees at Stena Renewable frequently plan internal meetings within and across the departments in order to discuss different issues as well as to exchange information and knowledge. The culture in all of the meetings is found to be open with an atmosphere that allows people to ask questions without being ridiculed.

6.5.4 IT-Tools

IT-tools are one type of systems that can assist employees in their work. At Stena Renewable tools such as the server, the Intranet and the case management system, called Qoll, have been identified as IT based tools used to share and store information and knowledge. In addition, a mobile application and a computer screen placed in the shared common area also provide a technological mean of receiving updates on the production and selected KPIs etc.

The Server. Today, Stena Renewable uses the central server as the database for storing documentation. On the server there is one folder for Project, one for Operations and one for Finance. All of the employees state that they find their way through their own department's folders, and they believe they have a relatively good and logical structure to them. But when they were asked if they are able to find documents and reports easily in other departments' folders the answer was not as confidently positive. As one employee expressed it: "*I find what I need to find, in other cases I have to ask*".

Intranet. Stena Renewable has an Intranet which set up to be used for sharing documents and information. The employees do not currently see the purpose of sharing information and knowledge through this forum, which has led to that the Intranet not is utilised today.

Qoll. Qoll is a, to Stena Renewable, new Case Management System that will be used for monitoring complaints and feedback from external and internal users. The system will also be used for environmental inspections and risk assessments as well as a register for fixed asset. In the case of environmental inspections, templates for how the inspections should be done will be found in Qoll. The results from the inspections as well as which actions which have been taken will then be documented within the system. The same applies for risk assessments. The fixed asset register will be used as a database to collect as much data as possible about each turbine such as gear box model and manufacturer etc.

Due to that the system is under implementation and information about what the system will do and be used for have not yet reached all employees, the employees' opinions about Qoll differ. Overall, all employees are seem to be positive towards the new system and think that it will support the organisation as a whole. However, they mainly think it will be used by the operations department hence not everyone has chosen to be involved in the implementation process. The only risk that one employee highlighted was the risk for "over documentation". If too much information should be documented, it can become too time-consuming and end up being inefficient which could lead to no documentation is done at all.

Mobile Application. The mobile application is used to make it possible to follow, in real-time, the wind turbines' production, current wind speeds, if some turbines are standing

still etc. All employees have this application installed on their mobile phones and they appear to check it quite frequently, even after work hours as well as during weekends, even though the current production is not one of their responsibilities. This could also be a sign for the employees' shared and genuine interest in the company's production and success.

TV screen. Another tool that Stena Renewable possesses in order to, in real-time, follow the wind turbines' production, the wind speed as well as how well they are doing against the budget is a TV screen located in the kitchen area. Based upon observations, it has been noted that this is a place where conversations often starts, both when employees and guests pass by as well as during lunch times when people are sitting in front of the screen. It has, however, been shown that when the person responsible for the statistics shown, is not at the office the computer that provides the information is not switched on. Other employees have tried without success.

6.6 Knowledge Process

Stena Renewable's current vision, strategy, culture, structure, and systems presented above reflect how they work with creating, sharing and storing knowledge in order to enhance their performance. The company is, as mentioned above, largely affected by the ever changing environment in which they operate. Changing policies and laws as well as the fluctuation in price on electricity and energy resources, both nationally and internationally, forces them to constantly adapt and learn. This is done primarily by a continuous analytic process which leads to conclusions that in turn decides how future processes and strategies will look like. Also other problems and new ideas that are identified within the organisation are first reflected upon and alternatives are considered and discussed before choosing the path that looks most promising. Sometimes it does not work as intended and the process or strategy is reverted to the previous one. New ideas, processes and strategies are then distributed both horizontally and vertically throughout the organisation by for instance meetings and reports.

Stena Renewable is, according to the CEO, largely dependent on reports created by the employees. It is a way to both share and store the organisation's knowledge as well as it can often lead to a creation of new knowledge for the ones who reads them. But the reports are also an important tool used to support the continues improvement process in the sense that by changing the demands of the content of the reports frequently, no one becomes stuck in a certain way of working, but are always exploring new options to do things.

7 ANALYSIS

In this chapter the empirical findings are analysed according to the theoretical framework and the analysis will follow a structure based on the Knowledge Management Framework where theory and analysis regarding methods and tools that can be used will be included when suitable. On basis of the KM Framework, the analysis will start with the company's vision, but here presented in combination with the Strategy. Subsequently, an analysis of the company's Culture, Structure, Systems and Knowledge Process will be presented.

7.1 Vision and Strategy

Since Stena Renewable, and probably many companies in a similar situation as them, has not officially worked with Knowledge Management in the past, there is presently neither a vision nor a strategy for this specific area in existence. Nevertheless, it does not imply that there is no KM taking place at the company. KM is not something new, companies have always worked with it to some degree even though it has not been outspoken, just imagine the apprentice system in medieval blacksmiths for instance. In recent years however, it has been brought to light by scientists and business managers. As stated above, KM exists at Stena Renewable, and as it will be argued subsequently, it is done relatively successfully even though it is not done formally. This is primarily due to that the other accelerators functioning in such a way that they enable the employees to exchange and create knowledge, without specifically having a strategy that facilitates KM.

In the theory it is stated that the vision is the core of the KM Framework. Within Stena Renewable this is not really the case. The company has a vision which is not well known among the employees hence not gathered around. Instead it can be argued that they have a shared understanding for the company's work, as well as the fact that all employees seem to be passionate about wind power. Based on this shared understanding and excitement the employees are able to communicate with each other in a mutual language, which in turn creates their shared meaning. Just the fact that the employees check the wind application on their mobile phones on a Friday night together with a glass of wine proves to some degree that what they are doing means a lot, also since operations might not even be one of their responsibilities. While it might not be exactly the same as a shared vision, which is could be viewed as a the "dream scenario" for which the company should strive to get to, it could be argued that in this case, the shared meaning fulfils the same purpose by gathering everyone into the same focus, though arguably one with a definite shorter time horizon, yet with as strongly emotional connections.

Furthermore, since a strategy is usually closely linked to and often born from the vision, it is understandable that these two areas are not developed yet for KM in the case of Stena Renewable. Focus for young and small organisations are usually not on this area, but on the primary business instead. And so would be the case with the studied company, who has chosen to develop a strategy for building a sustainable and profitable wind power industry, before setting up a strategy for treating knowledge, which could be considered quite sane and does not conflict with any theories presented. However, they have, much because of this case study, started to be aware of the challenges of KM and what gains that might be obtained when managed successfully which might foster a strategy in the near future.

To conclude, though a shared vision and a strategy for KM is not present at Stena Renewable, knowledge is still managed quite successfully much because of a shared

meaning. A first step is to create awareness for the challenges, risks and opportunities that are associated with the area. Subsequently, strategies and visions can be developed that fits the company in question.

7.2 Organisational Culture

Perhaps the most important reason why knowledge is flowing in the office of Stena Renewable is the company culture, which has its base in the strongly shared meaning, discussed above.

Culture has been discussed as a very important factor in order to enable Knowledge Management. But creating and shaping an organisation's culture is not easy. Stena Renewable is however in a favourable situation due to that the company is small and young; shaping their culture would therefore be easier than for a larger organisation. The existing culture within the company is based on in addition to a shared meaning; a mutual language, trust and openness, which are positive factors in connection to Knowledge Management. This means that Stena Renewable may not need to change their culture but they need to maintain and keep it. Moreover, it has also been shown that Stena Renewable is continuously working on improving their processes as well as is continuously adapting to the ever changing conditions on the global market. In combination with being a flat decentralised organisation they can be viewed as having a culture of learning; being a learning organisation.

In the theory it is discussed that a learning organisation is based on the gap between the reality in which company acts in and their vision. Stena Renewable has a vision of becoming a leading actor on the Swedish market; presently they are not however, which means that there is a gap between the reality and their vision.

Another thing that according to the theory makes Stena Renewable into a learning organisation is their ability to, as mentioned, adapt to the surrounding world and its conditions. In other words, they have a system thinking mind-set; they see the big picture and understand that they have to adapt to be able to survive. This system thinking can also be viewed at an organisational level where the members are frequently communicating with each other, which have led to a shared meaning (instead of a shared vision) as well as a team spirit where they solve problems together (team learning). The system thinking also involves managing mental models, which in the case of Stena Renewable can be done as a result of their relative openness to change. They are aware of that they may need to change their pictures of how things are working to be able to adapt to their surroundings as well as they are aware of the fact that they are working in a relatively new organisation where best practises is yet to be found in many areas.

In the theory it is also stated that a learning organisation as well as providing challenges, freedom, resources, work-group features, supervisory encouragement, and organisational support all foster creativity. Creativity was something that the CEO highlighted as being important for the company and something that is needed to be maintained. If looking at Stena Renewable from the perspective of these six managerial practices they all can be found within the organisation. Again, due to that it is a relatively young company where a lot of knowledge is constantly created since the employees regularly faces new situations and challenges. When facing these problems they have the freedom to solve it in the way they think is most suitable. One example is the project leaders' ownership of their own projects, they are responsible for that the project becomes successful but no one tells them how it should be done; while they are not in charge of which mountain to climb, they are in charge of how to climb the specific mountain.

Furthermore, it can be hard for Stena Renewable to manage the time resource since parts of their projects depends on different external authorities and municipals' decision making processes, which they can only influence slightly. However, by making sure that there are several projects managed by a single individual at once, it allows the project leaders to shift focus rapidly when a project is stuck in an external process. Additionally, since the projects do not cost any significant money to have on hold and not much has been invested in them when they are at this stage, it is not an issue in this sense either.

When looking at Stena Renewable's work processes and projects, it can be viewed as they have a team, or work-groups, connected to each project. In the theory it is stated that it should be a shared excitement in the work-group as well as a diversity of backgrounds. In the case of Stena Renewable, a shared excitement exists as discussed earlier, but a diversity of backgrounds is harder to identify. The employees have histories form a few different industries but more or less the same educational and cultural background. Even though the group is quite homogenous however, it does not have to be a disadvantage, but is something to think about. Ensuring that the group does not become too similar so that creativity is restricted is vital.

Stena Renewable clearly has favourable conditions for building a creative organisation. But for the employees to seize this opportunity, it is necessary that the leadership continues to be encouraging and supporting, as well as keep the organisational support in question of new ideas, collaboration and communication. But sometimes this is not enough to motivate people to be creative and do a good job. Within Stena Renewable one can also see that the employees' motivation is based on their genuine interest for wind power and for the company's success. It can therefore be said that a strong intrinsic motivation amongst the employees exists, which is important and preferable. Creativity is important, without it no more innovative ideas will be born and there is a risk that the employees lose their commitment to their work. It is therefore important for Stena Renewable to be aware of the favourable conditions they have but not necessarily push the employees much harder to come up with innovative ideas as this would probably increase stress and lead to exhaustion.

Another factor that can be used for shaping the wanted culture, as well as fostering knowledge sharing and creation, is the physical workspace. To build an environment which pushes the culture in the right direction and that improves the knowledge sharing and creation, one has to understand how the employees interact and the diversity of activities within the company. Within Stena Renewable it is preferable to have the office structure in the way it currently is, where all employees have their own office space since they are working mostly independently and have the possibility to close the door if needed. The offices are designed with glass doors and walls which increase the visibility and create opportunities for spontaneous interactions. The kitchen area creates movement among the employees as it is located in the middle of the office. Furthermore, the computer screen in the kitchen is also a discussion starter and enhances the shared meaning when everyone has the possibility to follow the production. It is however worth a though that it seems like it is just one employee that knows how this screen works. It might neither be a critical factor to the success of the company nor value adding to its core activities, but this is the kind of behaviour that needs to be addressed throughout the company, ensuring that it does not happen where it is important.

A further topic related to creating a creative culture and environment discussed in the theoretical framework chapter was creative chaos. There is some natural chaos occurring due to the very nature of a newly formed organisation since they are continuously facing situations never encountered before. Hence it might not be preferable to promote such

chaos by for instance short deadlines or stressing the technological progresses by competitors since this could lead to unwanted exhaustion.

In the theory it is hard to find specific methods and tools that focus on how to change a culture. It has however been shown that people easier change if they can see what is in it for them or if the idea comes from themselves. One way to make this happen is through telling stories in a way which make employees able to relate to them and start coming up with their own ideas and solutions to issues. Storytelling is also a tool for sharing knowledge, telling stories is part of how leaders and employees communicate with each other and it is thus important, both for Stena Renewable and other organisations, that it is thought of which stories are being told and how these influence the culture.

In conclusion, Stena Renewable has a favourable culture for knowledge to flourish. The company needs to continue maintaining and develop the desired culture using for example the methods and tools suggested above, this is especially vital to think of this when new members join the organisation and it is easier to do when the company is still young and small.

7.3 Organisational Structure

The structure of the company is flat and uncomplicated with two quite obvious main functions, projects and operations. In addition there is the energy trade side and a few supporting roles, hence enabling short communication roads. This is further enhanced by the fact that consultants are frequently used for specific tasks, and even more by having shared functions such as HR and IT with the rest of the Stena Group which allows the company to focus on their core activities and keep a smaller organisation while still enjoying some large scale advantages. Moreover, this allows both the consultants and the shared functions to receive input from several instances which is preferable from a KM perspective.

This kind of structure in an organisation also makes it easier to know where to turn for a specific kind of knowledge. The risk is, however, that in a company like Stena Renewable, where the employees are working independently and have their own responsibilities, is that no one else has the knowledge, which in turn increases the need for sharing even more. A trivial but clear example is the company's computer screen in the kitchen area which cannot be put on by anyone else except the one responsible for the data shown on it.

The company's way of working results in a structure that has a team-oriented feeling. One type of team which has the ability to further foster creativity and create a learning organisation are self-organising teams, which are created around a shared purpose. Self-organising teams as they appear in the theory are not present within Stena Renewable; however the prerequisites for them to emerge are there. One of these prerequisites has to do with the amount of information that is shared between the members, Rate of Information Flow. Through an environment where the members need to share information and knowledge to overcome uncertainties and problems one can create an organisation where people want to communicate effectively. When looking at Stena Renewable this is the case between and within the Project Department, Operations Department and the Analysts. The departments communicate when needed both before and after they have handed over the project, even though most of the communication between them occurs in the handover process. There could be of value for the departments to have an overlap in their work so that issues can be found and addressed earlier. The analysts are however consulted in different questions both during the project phase and the operation.

For a team to be creative they need to have some degree of diversity, as discussed in previous section. This diversity can also lead to spinoffs; they can build on each other's thoughts and create innovative ideas. But to make this possible the team members need to respect and trust each other to be able to express their thoughts. Respect is something that pervades Stena Renewable. To question things is encouraged and there are room for all kinds of questions. This respect together with their common understanding for what they want to achieve are in-line with the theory regarding Degree of Diversity and Richness of Connectivity.

According to the theory it is important that teams are managed to deal with the anxiety that can emerge when being stuck and no progress seems likely. For Stena Renewable whose project can span over a few years this anxiety is likely to be seen. The organisation is however well aware of the long processes and all the waiting time which can be a reason for why this anxiety does not currently appear to be a problem.

The last prerequisite for a self-organising team is the degree of power differential, which means that the team members should be at a relatively same level of authority. Since Stena Renewable is a fairly flat organisation where the employees have a lot of freedom and responsibility for their own work the power differential within the team can then be viewed as low.

To sum up, Stena Renewable is currently structured in a way that is preferable for KM. They are frequently using external consultants as well as using functions that are mutual with the rest of the Stena Sphere which enables them to have shorter communication distances and a flat organisation, something which does not presently appear to be subject for change in the future. There are a few challenges though that the company must consider and be aware of.

7.4 Leadership

In the theory different models for leadership are presented. The different models have their pros and cons but there is one management model that is suitable for promoting effective knowledge creation, the Middle-up-down management model. When Stena Renewable was founded in 2005, it started as an entrepreneurial company with two people practically doing everything. This kind of company can be compared with the Bottom-up management approach. As Stena Renewable grew and developed their organisation they started to move towards a more industrialised company and also a management approach more similar to the Middle-up-down. In today's organisation, one can observe a supportive leadership with a lot of delegated responsibilities. Tendencies of self-organising teams and a team-oriented organisation can also be found. When looking at how the organisation shares knowledge one can see how they try to share it in different ways such as verbally, written reports, and through practice. In other words; the employees try to not hold the knowledge they have within themselves.

As Stena Renewable left the Bottom-up approach they also left the drawbacks that come with it, which for instance could be that it is a time consuming approach. But unfortunately Middle-up-down management has its drawbacks as well. It is now important that the organisation is aware that they are running a risk of losing the overall control of the organisation and that the employees are running a risk of human exhaustion.

7.5 Systems

Effective use of systems such as procedures, guidelines and instruments can help companies be more productive in their use of information and capacities. At Stena

Renewable, a few different types of systems have been identified which are used in a relatively successful way, but as it will appear, there could be a need for a few extensions in some areas. Below follows a deeper analysis of the company's work procedures, report and meeting structures as well as their IT-tools.

7.5.1 Work Procedures

Stena Renewable operates in an industry where the project process takes several years to complete and a large amount of money is invested. When spending such a significant amount of time and money on projects it can be worth to make a summary and review the project afterwards in order to learn and share knowledge created as well as to increase the efficiency of future projects. The value of reviews was also highlighted during the interviews with the employees.

Reviews can be held either formally or informally, but in both cases planning and preparation is needed. To be able to have a successful review the participants need to trust each other to be able express their thoughts. An open environment where people can express their thoughts already exists within Stena Renewable; this means that they are in a preferable situation for having successful project reviews after completion. One type of review that can be useful for Stena Renewable is the After Action Review, where the project team meet and discusses the four questions: What did we set out to do? What actually happened? Why did it happen? What do we do next time?

Another aspect, in connection to the project process, is the interface and transfer process between project and operation. According to the employees they have a "handover-meeting" where they confirm that all needed documentation exists, the problem is however that some documentation often is missing or not finished, which results in an unnecessary overlap in the departments work for some period of time. This overlap could however be turned into something positive. It is possible to save time if the operations department, in a structured way, starts to be involved earlier than they are today, instead of the project department being involved in the beginning when operations has formally taken over. In that way it is possible to control that all needed documentation is done in time, and it is also possible to receive a better understanding for which issues that have occurred during the project phase. When it subsequently is time for the "handover-meeting" it should be less confusion regarding which documents are needed and where these can be found.

In connection to the previously named handover-meeting, the employees expressed some confusion regarding how the documentation should be transferred from the project department's folder to the operation department's folder on the server and who it is that is responsible for doing it. One way of doing this is to for instance create a folder within the project called, "operations". In this folder it is ensured that all required documentation is stored. At the day of the handover-meeting this folder can be transferred into the operation department's own folder at the server. Regardless how it is done, it needs to be done in a structured way so no double-work is performed and no duplications of the documentation are created. It is also important that it is specified exactly what documentation is required by the operation's department.

7.5.2 Report Structure

Through structured reporting, organisations can communicate knowledge in an efficient way. Within the studied company one can find a report structure that the employees seem to be mostly pleased with. Everyone receives the information they need for their daily work and the information they want which satisfies their personal interests. It was

however brought up during the interviews that employees outside the project department wanted to have a better overview and status update for the company's different projects. The project department currently has their own reports with the statuses for their different projects, but it is not shared by the rest of the organisation. Therefore, it could be of value to summarise these reports into a few bullet points with the most important and interesting facts and later share it with the rest of the organisation. Another solution could be to inform everyone where to find the project teams' current reports so that those who are interested have the possibility look for the information themselves. Regardless how it is done, sharing this information in the same way as they already share information through the other reports can increase the shared meaning within the organisation even more, and all employees will have a better understanding for the company's situation.

Furthermore, it is important to consider the question of providing employees with information not essential to their daily routines. Some theories state that it can speed up processes when others state the opposite. Within Stena Renewable, where the employees have a genuine interest in wind power and eager for information even if they do not need it for their daily work, redundant information may have a positive impact on organisation's performance. It will also help employees assist each other with various issues, should it be desired. However, redundant information can also lead to an overload of information. A balance has to be found between the knowledge creation process and the information provided. In the theory, this is referred to as requisite variety which deals with the issue of having information stored at the correct location and easily accessible for everyone who it may concern. In the case of Stena Renewable, who is facing a problem with employees not finding their way on the server, this is something worth thinking about. Through ensuring that the employees know who owns what information and where it can be found, it is possible to prevent information overload and also to create an effective knowledge sharing processes.

7.5.3 Meetings

Planned and structured meetings are suitable for both sharing and creating tacit and explicit knowledge. What type of knowledge which is created and shared depends on the structure of the meeting, it can be a forum for discussion and dialog, or it can be a forum for informing. Stena Renewable has a few pre-set meetings of different character, some discussion based and some are more of an informing structure. These different types of meetings form opportunities for creating and sharing both explicit and tacit knowledge. Based on both observations and interviews, the meeting structure within the company seems suitable for their current situation, no meetings seem to be redundant and no meetings seem to be missing.

7.5.4 IT-Tools

There are several different IT-tools that are developed to help organisations in their Knowledge Management processes. But it is important that organisations consider what they want to achieve with their IT-tools, otherwise they face a risk of spending enormous amounts of money and time for nothing.

Stena Renewable is using their server as a document library or database. This is a suitable solution for an organisation of their size and it works relatively well. However, to be able to use a document library successfully the information has to be well-organised and categorised so that the right information can be easily found. For Stena Renewable this means that they may need to oversee the structure in their folders due to that the employees are having some problems finding information that is not stored in their own department's folder.

Finally, in the case of the new case management system, Qoll, which Stena Renewable has started to implement, it is important that they inform all employees regarding how it should be used. If the meaning with the system is not shared among the employees it will be hard to gain benefits from it, it cannot be any confusion regarding where and what information and knowledge should be stored. Without clear instructions for what should be entered into the system, there is a risk of information overload.

7.6 Knowledge Process

In the theory, the knowledge process is a circular process with no end; this is based upon the idea that no one is ever fully trained. This means that it is a process of continuously improving an individual's and an organisation's knowledge and skills. Within Stena Renewable, it has been identified that they are continuously working on finding best practices in all there major departments, Presently, they are mainly using a trial and error approach; by continuously analysing the current situation and discovering new ideas, they try to find new improved ways of working. This means that the company is constantly developing their knowledge, which is largely what the theory of a learning organisation is about; to learn in order to meet changing demands of the environment in which they operate as well as to become more efficient and effective.

Looking at their work processes, one can see that they have identified a gap of knowledge and information when they turn to external consultants for help regarding wind measurements etc. The same phenomena can also be observed for electricity prices where they have found a need to constantly analyse how it behaves and will behave in the future. By turning to consultants as well as to look deep into the patterns identified in the analyses, new knowledge can be created. Based on the situation discovered, the employees either inform their colleagues directly thus skipping the storing step or the new knowledge is documented and written down in one of their reports. The new knowledge may also be shared through meetings and if the group thinks that this knowledge can affect the way they work in a positive way they will try to apply it into the organisation.

In the process of creating, storing and sharing knowledge one can see how the information and knowledge spreads up and down the organisation; from individual, to department, to organisation and also down again. The way knowledge and information is spread in the organisation though, depends on the situation. However, it can be observed that explicit knowledge is obtained both through externalisation and combination where the latter is perhaps the most common way of creating this type of knowledge at Stena Renewable. Through meetings and telephone calls as well as the continuous analytic processes, new knowledge is documented and reports are created. These sources are subsequently combined with what is already known in order to create new explicit knowledge which can be used to for instance decide whether a location is suitable for a new turbine or if the business plan should be updated.

Furthermore, it can also be said that tacit knowledge is obtained and converted. Some tendencies to externalisation were found for instance when more experienced project managers tried to explain how to interact with people who are against the company building new wind turbines in their vicinity. As this knowledge is converted again into tacit knowledge within the employees, internalization is present. Finally, socialization is identified through for instance sending more than one project manager to important meetings where junior managers have the opportunity to observe aspects of the communication process which otherwise cannot be taught. Moreover, socialization is also something which is continuously occurring when people interact and communicate with each other in the office.

To conclude, Stena Renewable does have a suitable process for creating, sharing and storing knowledge. It could however be preferable to include some of tools and methods that have been discussed in previous chapters, to easier identify what knowledge that is needed for the future, faster create new knowledge, as well as share and store knowledge in a more structured way.

7.7 Outcomes

Since the company have not actively worked with KM in the past, it is hard to pinpoint the positive outcomes of it. But they are however consciously and continuously working with developing their processes to become more efficient. When looking at the project department they have, according to themselves, almost reached best practice in their way of working and the process of building wind parks. The new process is faster than before and they think they today know how to easier establish a positive relationship with landowners and other stakeholders. This result can be viewed as an outcome of an efficient knowledge process.

It can further be discussed that due to the preferable preconditions that Stena Renewable has to implement successful Knowledge Management; positive outcomes will most likely be a result. Things as for example identifying best practice, create efficient and effective work processes, and find new business opportunities are just a question of time before they should have gained from managing the accelerators the way they do while outcomes such as individual and organisational learning are already on-going.

7.8 Knowledge Management Framework

As the analysis was presented to the company's employees, both on an individual and a collaborate level, it could be observed that the employees immediately began to discuss their situation and associate the different elements to their own organisation, agreeing upon the things that the authors suggested as well as making own interpretations and connections to their own work. For instance could the CEO confirm that there was a challenge involved with the project department having a difficult time to report the statuses of the various projects, largely due to the feeling of solving issues related to these projects are more enjoyable than reporting but also that reporting could be viewed as a non-value adding activity. Furthermore, an excitement about the subject could be identified together with a confirmation that this was an important subject.

Based upon this information, it is likely that the framework develop is a suitable model for beginning to work with Knowledge Management. It contains the elements required for an organisation to start discussing the issues and challenges that are associated with the area and also to see what can be gained as well as which risks that can be reduced. Creating awareness for the topic as well as starting discussions about the subject were the objectives with the study from the company's side, and it is probable that other organisations can use the framework to start their journey towards successful Knowledge Management.

8 CONCLUSIONS

In this chapter some general conclusions will be presented and the research questions will be answered. The chapter subsequently ends with offering specific recommendations regarding how Stena Renewable should continue working with Knowledge Management.

Through this study some general conclusions, which are not directly linked to the research questions, can be drawn. Initially, it has been found that Knowledge Management is important for all organisations no matter size and industry. The question is rather how much an organisation needs to focus upon it to gain advantages and when to implement a specific strategy for KM.

Furthermore, it has also been discovered that initially, it is important to create an awareness of Knowledge Management and its benefits among the employees in the organisation. This awareness is created primarily through communication, for example through telling stories about how other companies have utilised KM successfully. Even stories about disadvantageous scenarios have the ability to create the awareness desired, even though it is generally recommended that stories with a positive ending are told. Based on the awareness, it is easier to hold discussions around the framework, which in turn will increase the understanding for the subject and its different important factors.

Through an awareness and understanding of KM it is possible for an organisation to develop a strategy for it. When an organisation starts to discuss the subject they will identify what methods, tools, and processes that already are in place to enhance KM. Through this inventory, it is possible to subsequently improve the methods the company has to gain an even superior outcome as well as expand their arsenal with additional methods, tools, and processes that will enhance Knowledge Management throughout the organisation. However, an actual strategy for KM may not be as necessary for small and young companies as it could be for larger organisations, this does not mean that they not working with it. Small companies are probably working in a way that foster knowledge sharing and creation without being aware of it, meaning that based on an awareness of the subject they will informally talk about it which in turn, indirectly, will lead to improvements of the accelerators and the knowledge process itself. In other words, for small organisations an awareness and understanding for KM may be more important than an actual strategy for it. For larger organisations, on the other hand, a strategy for how knowledge should be shared and stored may be necessary to make all employees work in the same way and not to lose knowledge.

With or without a strategy for KM it has been shown that successful KM within companies is mostly about an attitude among the employees and the organisational culture. A young and small organisation should take advantage of the fact that the culture is easier to influence, hence try to create a culture that fosters knowledge sharing, creation, and development early on. When the company then grows larger and becomes more complex; this culture can follow along which will set a solid base for further successful KM.

8.1 Answering the Research Questions

Main research question: How could a generic framework for Knowledge Management be constructed?

Through this study a framework for Knowledge Management has been developed. The framework is based on a comprehensive literature review which covered theories with different perspectives of KM as well as regarding how both small and large organisations

should work with it. Moreover, since general terms have been used which fit and can be adapted to most organisations, one could say that the framework is generic although it has only been validated on a single company. However, through the application on additional companies, the statement could further proved.

The developed framework is divided into four different sections to, in a systematic way, give an overview of all factors that have been deemed important to consider as well as to visualise the possible outcomes of successful KM. The structure of the framework aims to make the area of KM understandable and easily applicable to an organisation. The words used are broad enough to highlight areas that essentially exist within all organisations, thus it should be adaptable to several companies. What the framework shows, which is also important that everyone in an organisation understands, is that the employees have to gather around a shared vision, they need to have the same starting point and goal to be able to manage the accelerators in a successful way. When the organisation has managed to create an awareness and gained an understanding for the subject, it is possible start managing the other areas of the framework successfully. This awareness and understanding can be created through for instance discussing the subject, and this framework can lay the base for this kind of discussions.

Sub question 1: What main theories exist for Knowledge Management and are they competing against, overlapping or complementing each other?

Through this study both philosophical as well as more "traditional" Knowledge Management theories have been reviewed, the authors therefore believe that they have found theories that overall complement each other. If specifically looking at each part of the theories, starting with theories regarding an organisation's vision and mission, it can be discussed which of them creates the core of an organisation and if the theories compete against or complement each other. In this thesis, it has been argued that the vision, together with a shared meaning, are important and the mission does not have a significant part, the theories can thus be view as complementing each other.

Furthermore, when looking at the different theories regarding KM accelerators, these are mostly overlapping each other, which is the reason for why they, in this thesis, have been combined. Other theories that can be viewed as overlapping are the ones regarding the Knowledge Process. Here it a question of how detailed processes one wants to study. The theories regarding outcomes can also be viewed as overlapping as well as complementing, due to that the studied theories in some cases listed the same outcomes and in some cases different ones.

Finally, there are the theories regarding KM tools. As mentioned in the theory it can be beneficial for organisations to use more than one tool to achieve the wanted result, therefore the tools presented in this thesis can be viewed as complementing each other; a toolbox have been created from which organisations can choose the tools they found most suitable for their situation.

Sub question 2: How does Stena Renewable respond and react when studied upon from the developed framework?

The developed framework aimed to be used as a base for discussion to create an awareness and understanding for the area of KM within an organisation. In order to validate the framework and its usage as a discussion base, it was presented for the employees at Stena Renewable. When the framework was presented for the whole team they started to discuss and comment on the different areas and relate it to their own work as well as to the company as a whole. Even in individual, more informal, discussions with

the employees they applied it to their own situations. In other words, the employees at Stena Renewable responded to the framework as desired and it can therefore seem to be valid for companies in similar situations.

The authors have been working at Stena Renewable's office, which means that daily informal conversations regarding KM have taken place with the employees. These conversations have most likely led to that awareness and understanding for the subject, gradually have been constructed. This pre-understanding probably affected the discussion which started when the framework were presented for the whole team. It can therefore be argued that it is a relatively time consuming process to create a shared understanding regarding the importance of KM among employees; for everyone to be at the same page.

8.2 Recommendations for Stena Renewable

In this section, specific recommendations for Stena Renewable will be presented. Initially, it has to be said that the company has a preferable culture for managing knowledge, mainly due to that a strong shared meaning is present. It is important that the culture is continuously promoted and reinforced, especially when new members join the organisation to ensure that creativity is sustained and knowledge shared. This can be achieved by for instance using different stories of what is desired to achieve. Furthermore, it is important to ensure that the knowledge present today stays within the company by structuring it and through different ways of enabling knowledge sharing and storing.

Although the report may not revolutionise the way the company works with Knowledge Management, it has created an awareness of the issues and benefits that is associated with it, which perhaps is the most important part in a small organisation like Stena Renewable. Hopefully, these ideas will be further considered and developed as the organisation grows, improves, and changes, which means that they in the future, if grown larger in number of employees, need to develop an actual strategy for Knowledge Management.

Moreover, there are a few more specific recommendations for the project and operation department. Firstly, in the project process it would be beneficial to add a "review" step in the end of the process. This could either be in the form of After Action Reviews described in this report, or a different desired method. Additionally, a wish for regular updates on the statuses for different projects has been requested. Since this is not related to improving the core activities of the company, it must be ensured that it is done in such a way that it does not become too much of an obstacle to handle. The benefit, should it be achieved, is naturally an even stronger sense of meaning for the employees and further promote the sharing of knowledge. But it is important to remember that though there are benefits to sharing redundant information with the organisation, too much of it can easily take too much time from the value adding activities. It is therefore vital the report structure is well balanced to what is within the organisation considered requisite.

For the operations department on the other hand, it would the preferable if they designed specific requirements for the handover from project to operations. As both parties will be very certain of what is to be done. Additionally, it would also be advantageous if the handover process would not only be a specific meeting, but an overlap throughout the finalisation of the specific project. An official meeting or date could still exist where the formal responsibility is transferred and files etc. moved, but it is possible that this would go much smoother if everything is basically ready at this time.

Other minor details which are important to consider are the folder structure of the server; ensuring that the content is easily accessible for the one who needs it, ensuring that the meaning of the Qoll system is extensively communicated so that everyone knows what it

should be used for and by whom and finally to continue to use tools such as the TV in the kitchen as well as the mobile application to increase the meaning that is so strong within the company and to share knowledge.

9 DISCUSSION

In the final chapter, a short discussion will be presented concerning the results of the thesis.

In the thesis, an extensive literature study of the area Knowledge Management has been performed and a framework for how small companies should work with the area has been developed. The framework was subsequently validated through testing it on only a single company, Stena Renewable, which can be argued whether it is enough in order to recommend the framework to additional companies. The authors believe that the framework and the conclusions can be applied to other companies since it incorporates ideas from well-known authors and builds on an established model. However, with the help of further studies using different designs such as experimental, comparative, cross sectional, and multiple case studies, it would add more validity to the framework and be able to give more general recommendations and conclusions.

Moreover, one issue which also needs to be discussed is whether the suggested framework is at all preferable to the one for instance presented by APO. Because the framework developed tries to combine several sources with additional material and discoveries in the Knowledge Management field as well as tries clarify some ambiguities with the APO model, hopefully the new framework will capture the important aspects even more clearly.

The scope of this thesis was neither to do a multiple case study nor was it to perform research of the implementation process for Knowledge Management which could have a significant impact on its success. Furthermore, the scope did not include a longitudinal research study to test and study the outcomes of the framework, in monetary terms as well as how it affects customer satisfaction etc., which would also give insight to whether it is a desirable model to work with. In the end though, the most important thing to remember is to begin by creating an awareness of the subject in any organisation for what risks and opportunities knowledge brings. Additional research to implementation models for small organisations would also be of use for organisations in the same situation as Stena Renewable.

Finally, it can be discussed whether or not the authors managed to stay objective throughout the study due to that they on a daily basis have been working in the same environment as the employees at Stena Renewable. It could be argued though that the risk of being subjective was relatively low and worth it considering the ability of being able to conduct comprehensive observations at the company location. This together with that the company, in the beginning of the project, highlighted that they wanted the authors to scrutinise the company properly and not be afraid to give honest and harsh recommendations, convinced the authors even more that the risk would be low and it would be worth it.

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