

Bridging the gap

- finding the processes to adapt a repository-based knowledge management system to the knowledge intense sales organization at IBM Nordic

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Master Thesis LIU-IEI-TEK-A—07/00230—SE
Department of Management and Engineering
Economic information systems

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Abstract

For knowledge intense companies the knowledge and skills of its employees are much more valuable than any physical assets. To share knowledge between its employees, some companies launch knowledge sharing initiatives which aims to spread best practices and increase the expertise of the employees. These initiatives are often supported by technical systems, repositories, which store the information that is to be shared. This report discusses how the value of such a repository, a Wiki containing reference cases of SOA projects at IBM Nordic, can be increased by using processes that aims to better connect it to the organization.

To do this, seven employees at IBM Nordic were interviewed. Four of them were sales people, the main user group of the Wiki. Two were employees at the SOA Acceleration Team, the group responsible for the Wiki. The last interviewee works at Learning and Knowledge, IBM's internal department for organization-wide knowledge management and education. The answers were analyzed using a framework created using academic theory. This framework consists of four different areas of requirements for the processes connecting the Wiki to the organization. The analysis showed that for IBM the most important area to manage is enablement followed by governance, motivation and finally content.

The report is concluded with recommendations for five processes to connect the Wiki to the organization. The process **Internal selling** aims to inform the sales people about the existence of the Wiki and how they are to use it. **Ensure search engine compatibility** makes sure that the sales people are able to find the contents of the Wiki via the intranet based search engines. The process for **adding a new case description** ensures that new case descriptions which are added to the Wiki is consistent and contains the right kind of information. By **validating the case information** that is added to the Wiki the acceleration team verifies that the information is correct, increasing its credibility. In the last process, **ensure information congruence**, the members of the acceleration team updates the guidelines on what information to collect and the information in the Wiki as the information need of the sales people changes. This is done on a regular basis and ensures that the information that is collected and stored is actually useful.

Preface

“Knowledge is of no value unless you put it into practice”

Anton P. Chekhov (1860-1904)

Though there are only five names on the front page of this thesis, many more people have been involved in its making. Our first thanks goes to Stefan Elfström for the guest lecture and discussions which eventually led to this thesis. We would also like to thank the many employees at IBM who has generously given of their valuable time for our interviews. Neither the Wiki nor this report could have been created without your help.

We would like to thank our supervisors at IBM, Sladjan Maras and Veljko Andrijasevic, for guiding us through the fascinating and sometimes confusing world of SOA. Your help has been invaluable during our time at IBM. The discussions we have had on SOA, the IT industry and life in general have been most interesting.

The academic guidance given by Alf Westelius, our supervisor from Linköping University, and Åsa Jernberg, our opponent, has been equally important. Without your feedback and ideas, this report would not be very interesting to read.

Finally, we would like to express our gratitude to our friends and families for supporting us during the writing of this thesis and during our time at Linköping University.

Stockholm, October 29th, 2007

David Backman

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1 Introduction

In this chapter the background and rationale for writing the report is presented.

1.1 Why is knowledge management important?

Today (2007-07-13 Friday) IBM's market capitalization is 162 billion dollars. That means that investors and institutions around the world are paying \$109 for each 1/1.48 billionth of the company. Most of these investors are professionals and some of them work solely with analyzing IBM – every day, every week, and every year. Of course, they are not infallible, but at least they seem to agree that the worth of IBM is somewhere around 162 billion dollars.

Looking at the balance sheet for 2006, we see tangible assets for about 88 billion dollars, having deducted posts for goodwill and intangible assets. What does this mean? Why are seasoned investors willing to pay an extra 72 billion dollars for IBM?

The Nobel-prize winning economist Tobin (1918-2002) defined “Tobins Q” – the quota between a company's market capitalization and the replacement value of its assets¹ (Bjerkeby, Brömer, Ericsson, & Palmefors, 2004). He claimed that when a company's Q was larger than one, it had high expectations from the market. These expectations could derive from assets not visible in the books; investments that had not yet paid off, a strong market position, the specialist knowledge of its employees etc. It means that the market is ready to pay more for the company than the value of its factories, buildings, machines and computers – meaning that the market accepts some sort of unrecorded value or asset in the company. Based on the figures from above, the Tobin Q for IBM would be 1.84, meaning the company is valued at almost twice the value of its physical assets.

Enter Thomas A. Stewart, today managing director of Harvard Business Review:

“The hard assets of a knowledge company contribute far less to the value of its ultimate product (or service) than the intangible assets – the talents of its people, the efficacy of its management systems, the characters of its relations to its customers – that together are its intellectual capital.” (Stewart, 1997)

What Stewart (1997) and a number of his colleagues are saying (Davenport, 1996)(Edvinsson, 1997) is that many companies today contain great value in the knowledge

¹ Tobins Q can be calculated in many different ways, but this is the basic idea. The calculations presented should suffice for illustrative purposes.

embedded in the company. This knowledge is of many types: understanding of customers, technical know-how and documented procedures for important activities. In a special type of companies, what Stewart (1997) calls knowledge companies, this knowledge is more important in the value creation process than the physical assets.

Companies' knowledge can rarely be seen in book-keeping, and though some companies have created special book-keeping for intangible assets (Edvinsson, 1997), the easiest way of seeing it is through a company's market valuation. If the market values IBMs collected knowledge to several billion dollars, it would make sense to take steps to manage this knowledge.

A common way of managing the knowledge within an organization is to use repositories. A repository is typically some type of database or application where people can share information with their colleagues (Davenport, De Long, & Beers, 1998). This report is about how organizations can enhance their knowledge management by understanding the requirements of a repository which needs to be met in order for it to provide value to the organization. This is done by identifying the areas of requirements for the repository and creating processes to meet those requirements.

1.2 Background to the assignment at IBM

During the spring of 2007, an IBM employee and former student at Linköping Institute of Technology held a guest lecture on business process design and Service Oriented Architectures (SOA). SOA is a large and complex topic and lacks a strict definition. The least common denominator seems to be that it is a business architectural style that includes the use of loosely integrated components. It is suitable for large enterprises and is said to enable more flexible business processes. It is not necessary to have an understanding of SOA in order to appreciate this report; it discusses exclusively knowledge management (KM) and not the technicalities of SOA.

IBM has decided to embrace SOA as one of its overall strategies and is trying to get its customers to move over to Service Oriented Architectures. In order to do this, the understanding of SOA must be enhanced across the whole organization. It is especially important to spread information to people working with sales, since it is important that they can explain SOA in a proper way when they are in contact with a customer.

In order to sell more SOA projects, a team was created at IBM with the purpose of accelerating sales of SOA related projects, the "SOA Acceleration Team". The team is organized around geographic regions and the team active in Sweden is the "Nordic SOA

Acceleration Team”, henceforth referred to as “the acceleration team” or “AT”. In addition to working in Sweden, it is also active in Denmark, Norway and Finland.

After the lecture mentioned above, a master thesis at IBM was negotiated and it was decided that it should center on some of the knowledge management aspects of the acceleration team’s activities. Specifically, the AT wanted information collected about all SOA related projects in the Nordic region and have this information published in a Wiki-based repository (a Wiki is a special kind of web site where anyone can change the contents of a page.). The purpose was to provide people working with sales with information about how successful selling of SOA had been done. It was also decided that we would write an academic report on how to make this Wiki a valuable tool for the organization.

1.3 The assignment at IBM

Our work at IBM was divided into several parts. These parts are illustrated in Figure 1 and are described in detail below. The squares in the illustrations are activities, meaning this is something we did during the project. The hexagons are entities, meaning “some thing”, for example a requirement or a recommendation.

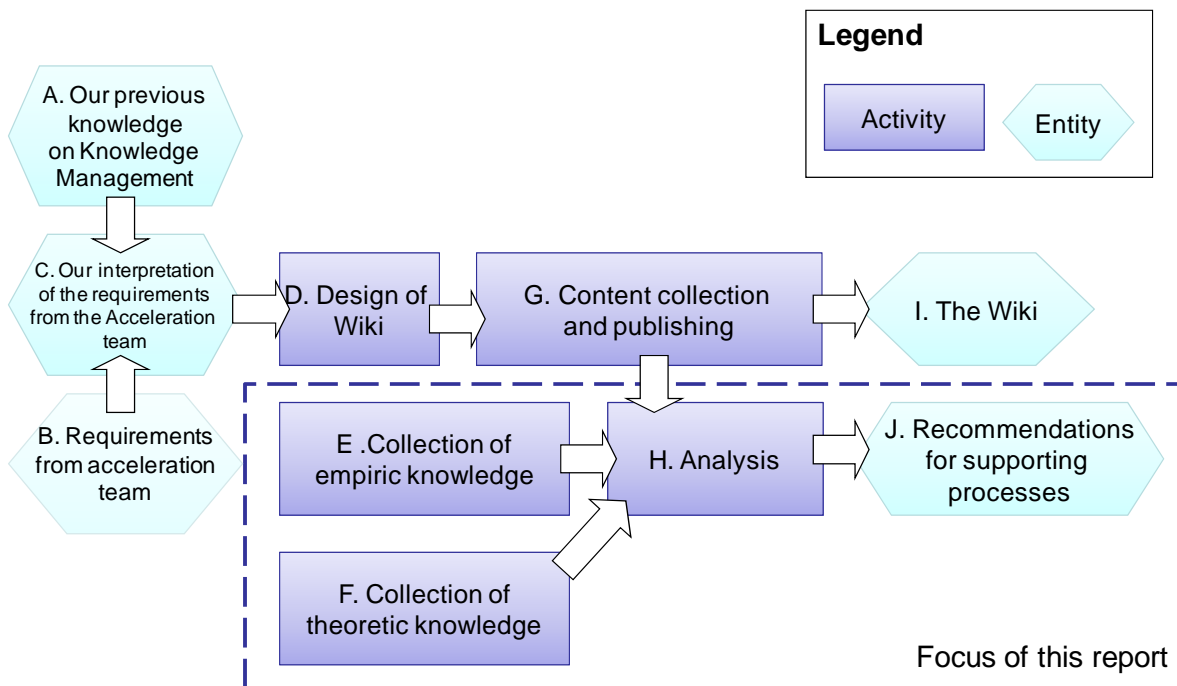


Figure 1: Map presenting an overview of the activities for the thesis.

1.3.1 A. Our previous knowledge on Knowledge Management

Both authors have a background in natural science, but have also both studied knowledge management from an organizational and social perspective. Therefore, it was easy to consider not only the repository itself but also the surrounding processes, the people involved and the control and governance of the information managed. The authors also believe that their studies in various management related disciplines helped them understand the complexity of the problem and see how a repository could never be more than just a part of the complete solution. This was an insight we carried from the first day of the project – that there would be a repository at the core of the solution but that an equally important part would be the processes connecting the repository to the organization.

1.3.2 B. Requirements from the acceleration team

During the first few weeks of the project, we had frequent discussions with people from the acceleration team regarding the purpose of the solution. During these discussions we were informed of the goals and requirements of the system but also that it would be up to us to decide how they should be achieved.

The most vital goal of the project was to talk to the opportunity owners² of all SOA related projects that had been won within the Nordic region. These people were to be interviewed regarding the project and “assets” were to be extracted. At IBM, the word “asset” refers to a piece of information with potential for reuse. This is typically a PowerPoint presentation or some other sort of document containing vital information regarding the project. There are also other kinds of information considered “assets”, for example a number of different industry specific frameworks that are used for several customers, e.g. best practices for processes within the insurance industry. We were also to document the information extracted in the interviews we did with the different opportunity owners and publish case descriptions of the different projects, together with the assets extracted.

As previously stated the acceleration team wanted the information collected to be published in a Wiki. The collaboration aspects of Wikis makes them suitable for sharing information, since one can typically refine information someone else has written by making changes to it or by adding comments. The most well known Wiki is Wikipedia, a Wiki based encyclopedia that a large number of regular users keep updated. In general, Wikis are an important technique for knowledge sharing at IBM and there are literally thousands of them. The reason that a Wiki was selected was that they are a recognized way of sharing knowledge

² The Opportunity owner is the person responsible for a specific sale. This person stays connected to the project from its inception to the delivery.

and that they are the easiest way to publish internal information at IBM. Also, Wikis are a fairly modern and popular technique for sharing knowledge, making it the natural choice for the acceleration team.

1.3.3 C. Our interpretation of the requirements from the acceleration team

We immediately saw both potential and problems with the solution outlined by the acceleration team. For example, we discussed how to get information about new projects entered in the system – who should do that and how should that person be motivated to do it? Who should be allowed to enter new information – anyone or just certain people who had been given authority to do so? What kind of information should be published, more exactly? If too much information is published, it is more difficult for the user to find what she needs; if too little is published, the risk of the user not finding any meaningful information increases. The acceleration team had not made any requirements regarding such things.

We also realized that it would be impossible to describe projects in such detail that someone could get all their questions answered from just reading about the project. Rather, we decided to describe a project on such a level that someone could understand the most important aspects of it and assess whether or not it was relevant to their specific case. If so, the reader could contact the responsible people in the project to get further information. This had the extra value that it encouraged voice communication between people working with related projects, which we believe is key to good knowledge sharing.

1.3.4 D. Design of Wiki

The design of the Wiki was a fairly straightforward activity. Based on the discussions with the acceleration team and employees working with sales, we decided which aspects of the projects that would be of value to describe in the Wiki. Based on this, we created a questionnaire containing questions about these aspects. This questionnaire was used as a starting point when conducting the interviews for gathering information from the SOA projects. It can be found in appendix A.

We decided to create templates and guidelines for the contents of the Wiki so that it would be easier to find things in it. The structure created by the templates and guidelines implies that certain information should be entered, for example the goal of a project. We believed that this structure would help contributors to not forget to describe the most important aspects of the project.

1.3.5 E. Collection of empiric knowledge

This activity entailed the collection of knowledge about the acceleration team, IBM, IBM’s culture, the sales personnel, the sales process and other aspects important to the acceleration team’s work. This activity is described in more detail in the chapter “2.5 Collecting empirical information” and the results are presented in the chapter “4 Investigation”.

1.3.6 F. Collection of theoretic knowledge

In order to analyze the processes connecting the Wiki to the organization, we needed a theoretical framework. The development of this framework is described in greater detail in chapter “2.4 Use of theory” and the results are presented in chapter “3 Literature study”.

1.3.7 G. Content collection and publishing

To get us started with the work of collecting information and assets from interesting projects we were given access to a number of lists containing information about projects within the Nordic countries. The common denominator of these projects was that they were tagged as SOA related and having the status won, i.e. that the contract had been signed with IBM. However, we were informed that these lists would refer to projects in different stages of the implementation process and the projects relation to SOA could vary. Some might be very little SOA related and some would still be in too early phases to provide any interesting information. This led us to believe that performing in-depth interviews with the owners of all of the projects in the lists would be too time consuming. In order to process this vast amount of information and reduce the amount of work we developed a three-step interview model. The purpose of the model was to identify the most interesting projects as early as possible. The model is outlined in Figure 2.

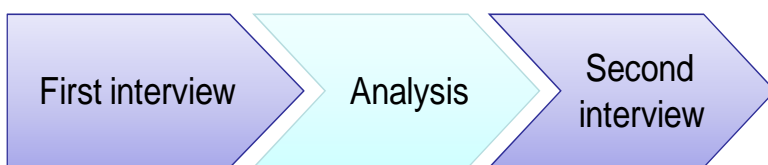


Figure 2: The interview process.

During the first step the model we focused on getting general information regarding the project in order to get an overview of the project’s purpose, goals, technologies used, processes etc. The second step was to analyze the gathered information and determine whether the project was interesting enough to present as a SOA case in the final Wiki. The analysis was based on how well the different aspects of the project coincided with the principles of SOA. If the project was interesting enough we contacted the project owner again and conducted a second interview. This time the focus was on getting more detailed

information from the project. “Lessons learned”, “key success factors for winning” as well as information regarding the delivery of the project, key personnel and assets produced and used were just a few aspects of the information gathered. This information was then compiled into a text that was published on the Wiki together with other assets, such as presentations used during the sales phase and workshops which were relevant for the project.

The interviews we did during this activity also affected the analysis, since we learned a lot from the sales people we talked to during these interviews. The interviews focused on understanding the cases the opportunity owners worked with, but often we also talked about their work with finding the right information and what kind of information they needed. We also talked about the sales process they use, which varies greatly from opportunity owner to opportunity owner and how the Wiki could support it. Finally, on a few occasions we discussed what would make opportunity owners contribute information to the Wiki. It is impossible to say exactly how we were affected by the interview, but the interviews with the opportunity owners gave us a better understanding of the sales processes and culture within IBM that we carried with us throughout the study. At some points in the study, we have made general statements about the opportunity owners and sales people – if nothing else is mentioned, these statements are based on the interviews with the opportunity owners.

The cases that were gathered are considered IBM confidential and are therefore not to be made available outside of the company. For this reason, no results from the interviews are presented in this thesis. In total, about 50 people were interviewed concerning about 80 different projects in 4 countries. Out of these projects, about 15 were chosen for having second interviews conducted and case descriptions written. The information on the remaining 65 projects was archived.

1.3.8 H. Analysis

The analysis conducted is described in more detail in the chapter “5 Analysis”. Essentially, the collected empirical data is analyzed using the framework developed in the literature study. The analysis is then used as a base for recommendations for the processes needed.

1.3.9 I. The Wiki

The Wiki is the first of the two deliverables for the assignment at IBM. The Wiki has been created by the authors and is at the time of writing as a small but carefully designed embryo of a knowledge management solution. It contains the case descriptions written during the content collection, an overview of SOA and a collection of links to material concerning SOA.

1.3.10 J. Recommendations for supporting processes

This is the second deliverable for the assignment at IBM. It is a description of the different processes we recommend to ensure the use of the knowledge management system. These descriptions can be found in the chapter “6 Conclusions”.

1.4 Purpose of the thesis

As mentioned in the introduction, it was decided that the report would be about the processes that connects a repository (for example a Wiki) to the organization that uses it. An example of such a process is the process in which someone adds new information to the repository.

The purpose of this report can be summarized as: *“Examining how to increase the value a repository can provide an organization by understanding the areas of requirements of the processes necessary for connecting it to the organization, describing these processes and exemplifying this with the SOA sales Wiki implemented at IBM”.*

The purpose has been broken down into the following:

1. *Which areas of requirements exist?*
2. *Which processes are needed?*
3. *How should these processes be designed?*

1.5 Delimitation

We believe that the knowledge management activities relating to the Wiki employed by the AT in very abstract terms can be described as a three stage cycle: Collect → Transfer → Use → Collect. The “collect”-stage of the cycle is about gathering information, filtering out what is not important and making it readily available. The most important information is then codified and organized in a way which maximizes its potential value. The “transfer”-stage of the cycle is concerned with spreading this information to other persons. This stage can take many forms – accessing databases, attending conferences and personal networks are the foundations of some of them. Finally, the “use”-stage is about applying knowledge to create value for the individual and the organization.

This thesis focuses mainly on the “collect” and “transfer” stages of the cycle. Not all aspects of the “use”-stage are discussed, especially not how the sales people should apply the information retrieved from the repository during their sales process. The reason for this is that how knowledge should be combined and applied when selling new projects is a very complex matter because of the diversity of the customers across industries and geographical areas. However, the “use”-stage has affected the results of our study to some extent. The

most obvious example is that it is the kind of information that the employees think is of value in the “use”-stage that should be collected in the “collect”-stage.

1.6 Reading guide

A short description of each chapter in the thesis and some recommendations on who might find it interesting to read is presented below.

Introduction – This section introduces the report. It contains a description on the background to our work with IBM and a detailed description of the project of which this report is a part. It also contains an elaboration on the purpose of the report. It is intended for everyone reading the report.

Method – This section starts off with a discussion of research philosophy which is then used to create a research design for the study. It also outlines how empirical and academic information was collected and used. It is intended mainly for the academic reader and the reader interested in understanding in more detail the scientific method on which the report is based.

Literature study – This section contains summaries of the major theories on which the analysis is based. It also develops two different models that are used in the analysis. It is intended for the academic reader and for the reader interested in general knowledge management theory. Knowledge management practitioners would perhaps find the models presented in “3.2 Knowledge management” and “3.4 The OPR model” interesting.

Investigation – This section contains the information collected during the investigation at IBM. The material consists of both structured interview data and descriptions of different initiatives and systems at IBM. It is intended for all readers and is necessary for understanding the analysis.

Analysis – This section contains the analysis of the material gathered at IBM. It also contains a prioritization between the different things that need to be done at IBM. It is intended for the reader interested in understanding the underlying reasons for the recommendations in the final chapter.

Conclusions – This section contains descriptions for a number of processes that IBM are recommended to implement. It also contains a discussion on the generalizability of these processes to other companies. It is intended for everyone.

2 Method

This chapter of the thesis discusses the scientific basis on which the research rests and the method used for the research.

2.1 Research philosophy

There are two main scientific philosophies: positivism and hermeneutics. Hermeneutics is sometime called interpretative research, since the word hermeneutics is to some extent associated specifically with bible studies. Positivism is the philosophy mainly associated with natural sciences (Eriksson & Wiedersheim-Paul, 2001). It is the philosophy the authors are most used to because of their background in natural sciences.

2.1.1 Positivism

Positivism is a widely accepted research philosophy. One of the founding fathers was Francis Bacon, who saw reality as bound by concrete laws that could be observed and understood. He claimed he had a positive view, that science should help society and people. The term positivism comes from the French sociologist August Comte who wrote the book “The ceur de philosophie positive” which states that science should build only on certain, “positive”, knowledge.

Typical positivistic ideas include:

- Science is based on observations
- Science produces knowledge of law bound relations
- Science is agnostic towards the use of its results
- The value of science is in its technical and social use (Mårtensson & Nilstun, 1988)

Positivism allows two sources of information: our own five senses and logic reasoning. It allows three ways of reaching conclusions – induction, deduction and hypothesis-deduction. Induction is based on generalization; if the sun has risen every morning as far as I can remember it will probably rise tomorrow too. The obvious problem of induction is that a situation can easily be construed where induction fails. Bertrand Russel famously describes an inductivistic chicken that is feed every morning and thus induces that it will continue to be fed (Mårtensson & Nilstun, 1988). The chicken is right – until the morning it is killed and had for lunch (Eriksson & Wiedersheim-Paul, 2001). This means that empirical observations cannot logically be used to generalize from, which sometimes is referred to as “Hume’s truism” (Lee & Baskerville, 2003).

Deduction is based on logic reasoning. It draws conclusions from known “facts” or axioms. A classic example is that from the axioms “All humans are mortal” and “Socrates is human” we can deduce that Socrates is mortal. According to Hume, deduction is always hypothetical. It can predict what should happen in theory given specific conditions, but it does not always say something about reality since it is difficult to perfectly represent reality in axioms. (Eriksson & Wiedersheim-Paul, 2001)

Finally, the hypothetic-deductive method combines induction and deduction. A hypothesis is created that can be verified empirically by inductive studies. If the hypothesis is verified it can be used for logical deduction. Typically a number of hypotheses on how to explain a phenomenon are set up and the ones that cannot be falsified are accepted as true. (Eriksson & Wiedersheim-Paul, 2001)

In much contemporary research, a positivistic research philosophy is employed. The problem with it is that it requires quantification of the data used, which often is subjective. For example, in a test of a new psychoactive drug, a nurse typically does observations of the patients and makes an assessment of the drug’s effect. The nurse will then register the assessment that will look quantitative (e.g. “a four on a one to five scale”) but is really subjective. Therefore, much research that seems positivistic includes interpretative aspects. (Mårtensson & Nilstun, 1988)

In the 20th century, Wittgenstein brought pessimistic ideas to the table. He claims that logic is disconnected from reality and therefore is pointless. He claimed that logic could not be used to explore reality since it relies on language and language can only express simple empirical statements. If something cannot be expressed with language, it cannot be dealt with using logic, and since language is not sufficient for expressing complex matter such as ethics, morality and value, the use of logic is limited. Wittgenstein claims that the language of logic could be (and always has been) applied this kind of complex matters, but that the product is nothing but nonsense (Mårtensson & Nilstun, 1988). This also means that a positivistic approach could generate nothing but nonsense when researching more complex matters such as social interaction and organizations. Because of this we believe that a purely positivistic approach would not suit the purpose of this thesis.

2.1.2 Hermeneutics and interpretivism

The word hermeneutic means “the art of interpretation” and is also sometimes referred to as interpretivism. The purpose of hermeneutics is to understand human actions, within a context and not necessarily without any values applied. The hermeneutic spiral describes this process – the scientist starts with some knowledge, and then generates new knowledge

through interaction and interpretation. Through this spiral, the scientist can eventually reach a wider understanding of the actions and relationships within a domain. (Eriksson & Wiedersheim-Paul, 2001)

The objective scientist is one of the pillars positivism rest on and therefore the idea of the subjective scientist is somewhat hard to grasp. In the words of Baroudi and Orlikowski (1991):

“Interpretivism asserts that reality, as well as our knowledge thereof is social products and hence incapable of being understood independent of the social actors (including the researchers) that construct and make sense of that reality.” (Baroudi & Orlikowski, 1991)

Hermeneutics can be perceived as unscientific, since its results are not repeatable, nor can they “prove” anything in the sense sometimes ascribed to positivism. Yet, it does not intend to “prove”, but rather to understand and explain human actions.

2.1.3 Synthesizing a research philosophy

We understand positivism as a very theoretical philosophy that has its greatest value in fields governed by concrete and observable laws, such as applied physics and chemistry. We do, however, appreciate the notion of the value of science as its contribution to society. Being engineers, we have been exposed to a positivistic view of science during our education and therefore we tend to observe reality from a positivistic viewpoint. We believe that though such a viewpoint can be valuable, it is very limiting when studying complex matters such as people’s interaction in organizations and with information systems. Whether Wittgenstein was right or not when claiming that logic cannot be used to deduce knowledge about complex matters, we have decided not to apply a purely positivistic approach in this study.

Rather, a combination of hermeneutics and positivism is used, where our basic perspective is that of hermeneutics but also having a positivistic touch in seeking to quantify what can reasonably be quantified and also in the value of science; its technical and social use. The purpose of the study is therefore mainly to understand and explain, not to prove or disprove.

2.2 Research strategy

There are three types of research strategies; experiments, surveys and case studies, as the main strategies (Eriksson & Wiedersheim-Paul, 2001). According to Yin (2003), there are three conditions that decide which research strategy to use, namely:

- type of research question posed
- extent of control an investigator has over actual behavioral events
- degree of focus on contemporary as opposed to historical events (Yin, 2003)

Neither a survey nor an experiment suits our situation very well. A survey is usually a quantitative study which aims to measure peoples' opinions regarding a specific, often past, event. We have interviewed many employees at IBM during the course of our research study and thus it may have some of the characteristics of a survey. However, since our focus was to gather qualitative material, not quantitative, regarding a contemporary event we felt that a survey was the wrong approach.

In order to conduct an experiment it is necessary to isolate and control factors which are believed to affect the final result. These factors are then varied and observations are made on how the result is affected. Since it is very difficult to isolate factors in an organization and even more difficult to control them an experiment would not be a fitting strategy for our study.

Yin (2003) claims that if the research question is of the type "how" or "why", there is no control over the events and the research is focused on contemporary events, the case study is a suitable research strategy. Since our study is based on questions about "how" a repository should be connected to an organization, we have limited control over the domain we are studying and the focus is on contemporary events, we decided to choose the case study as our research method. Finally, the case study also better suits our interpretative research philosophy. (Yin, 2003)

2.3 Research design

The purpose of a research design is linking the material that is to be collected to the initial questions of the study. When creating a research design, the most important part is to identify the material that needs to be collected and how it can be used to answer the research questions. According to Yin (2003), there are five important components in a research design:

- Its unit(s) of analysis
- A study's questions
- Its propositions, if any
- The logic linking the data to the propositions
- The criteria for interpreting the finding (Yin, 2003)

The last two components are not well developed. There are a few models for how to do this quantitatively, but since this is a qualitative study the underlying logic for these two components is described instead.

The unit of analysis of our study is some of the acceleration team’s work with knowledge management. The team is a part of a north-east European group, but it is largely autonomous – therefore we have decided to focus on the Nordic team. We will also delimit ourselves to the team’s work with the repository for SOA sales personnel. The team has other tasks as well, but these are not discussed.

The questions of the study are (as previously stated):

1. *Which areas of requirements exist?*
2. *Which processes are needed?*
3. *How should these processes be designed?*

The key propositions of the study are basic hypotheses that answer the question(s) of the study. These propositions help the researcher approach the question and give her a reasonable place to start. After much thought and reviewing of literature, we have summarized our propositions in Table 1. Note that these are not propositions that we try to prove; they are rather an account of our ideas at the beginning of the study and are based on our personal experience and academic theory rather than empiric material. These propositions serves as a starting point for our investigation, but our investigation is not ended with them being falsified or proven. In no way are these propositions the only ones possible for our study. We believe that countless other propositions could have been used for same purpose. We were satisfied with these propositions simply because we felt they gave us enough clarification on where to start to look for information.

Proposition	Description
A	Only enabling people working with sales to codify and share their knowledge is not enough. People typically have things to do that they perceive as more important and without further motivation, most people will likely not spend much time codifying their knowledge. (Davenport, 1996)(Stewart, 1997)(Collison & Parcell, 2005)
B	Only the sales people know which information is of use when selling SOA related projects. If AT collects or edits information that sales personnel are to use, it is important there is a shared understanding of what information is of value.
C	The information in the Wiki should not be complete but rather enough so that the sales person can determine if the project is of interest to her or him. If needed, the relevant person involved in the project can then be contacted for further details.

Table 1: The propositions of the study.

The logic linking data to the propositions is what we conceive as the most important part of the case study's setup. This logic concerns the material that is collected and how it is used to strengthen or falsify the propositions.

The study used interviews as its main empiric material, since other relevant sources of were not identified. Three main groups of people were identified as relevant to interview: sales people, members of AT and people working with learning and knowledge management at IBM.

Role	Interviewed because it was necessary to understand...	Used in discussion about proposition...
Sales person	...what motivates codification and sharing of information	A
	...which information is important for sales process	B
	...how information should be structured to be valuable	C
AT	...how involved AT can be in codification of knowledge	A
	...which differences exists between AT's perception of which information is valuable and the sales people's perceptions	B
KM Expert	...if there are any cultural aspects that affects if a repository can be successful	A, C
	...how other knowledge management initiatives affects AT's work	A, C

Table 2: Why each role needs to be interviewed.

Table 2 summarizes why each role was interviewed and in the discussion of which proposition the answers could be relevant. A closer description of the interview design can be found in "2.5.1.1 Interview design". Of course there are a number of other stakeholders whom it would have been interesting to interview but for a number of different reasons we choose not to. The most obvious example is the customers of IBM; it would have been very interesting to see what kind of information they need from IBM in order to consider signing a contract with them. However, we realized it would be too difficult and time consuming to get in contact with employees on a high enough level in the customers organizations to acquire any such information.

It would also have been interesting to compare this initiative with similar initiatives conducted by companies similar to IBM, i.e. their competitors. However we believed no competitor would willingly share their knowledge to improve IBM's performance.

The criteria for interpreting the findings are concerned with how the collected material is interpreted to draw conclusions about the propositions. Based on our hermeneutic approach, we did not use specific criteria for interpreting the findings. Instead we applied our own intellects and then reasoned and explained our conclusions with the intent that our audience understands and accepts these conclusions.

2.4 Use of theory

As we have previously stated we had some knowledge of KM before we began working on this thesis. KM had been discussed in some of the courses we had taken during our last year at the university. This knowledge gave us a starting point when looking for new information. Conducting this study, we have read literally thousands of pages of academic literature; books, articles and proceedings from conferences. The first reason for doing this was to understand the research area of KM. In the study, much of this theory is reflected upon and a discussion of it can be found later in the study. The second reason for reviewing this literature was to make sure to ask the right questions and to start at a reasonable place – close enough to accepted theory so that we can build on it, but not so close that we just apply what others have suggested (Yin, 2003).

The theory framework was built using mainly academic articles and books. We started out with reading a few books by authors we had come across during our studies of Knowledge management, namely Thomas Davenport, Ikujiro Nonaka and Thomas Stewart. After that, we looked through some of the references from these books and also articles by authors mentioned in the books. The purpose of this was to try to build an overview of the whole discipline of Knowledge Management. When we considered ourselves to have an overview, we used academic search engines to find further reading on the topics that often were discussed in connection with repositories, for example motivation, knowledge management systems and knowledge workers. In some cases, we went into other disciplines, such as economics, in order to find suitable theory. We are aware that the theories presented during the literature study are not verified within this study's setting and can therefore not be guaranteed to be applicable. However, we have accepted them as generalizable to our setting.

The purpose of the theory presented in the report is to give the reader an understanding of what KM is and what activities it may include. When the groundwork is laid, a discussion on

how processes can help increase the value a knowledge management system provides to its organization is presented.

2.5 Collecting empirical information

The collection of the empirical material is a very important part of a case study. To increase the readers understanding of the methods we used to collect information and the principles we adhered to while doing it are described below.

2.5.1 Methods

There are six ways of collecting information: documents, archival records, interview, direct observation, participant observation and physical artifacts. *Documentation* is written material, for example letters, agendas and newspaper clippings. *Archival records* are different sorts of kept records, often service records and personal records. *Interviews* are formal guided conversations with selected persons of interest. *Direct observations* are about observing some phenomenon in person, for example by watching someone doing their task at work. *Participant-observation* is related to direct observations, but here the researcher does not take a passive role but rather participates in the phenomenon being studied. Finally, *studying physical artifacts* is about gathering information by studying for example materials used or created in the studied phenomenon. (Yin, 2003)

Our main source of information for this thesis has been interviews, and their design is described in “2.5.1.1 Interview design”. A number of systems were also studied, specifically IBM’s internal knowledge management related systems. Finally, Wikipedia has been used as a source for basic information although its use in academic research has been questioned. We have decided to use it for basic information that does not directly affect the quality of the thesis.

2.5.1.1 Interview design

In a case study, interview technique is critical, or in the words of Yin (2003): “...*case studies require an inquiring mind during data collection, not just before or after the activity*” (Yin, 2003). Since the researcher cannot anticipate what the respondent will answer, the researcher must always be ready to challenge her own assumptions when confronted with new facts, while still considering that she is just getting one of many opinions about reality. To enhance the material collected during our interviews we have decided to always do them together, using two interviewers. The purpose of this is that the interviewer not asking questions is less preoccupied and can more effectively think about the respondents’ answers and what new questions they lead to.

In order to create the processes necessary to connect a Wiki to an organization, a lot of information on the organization was necessary. To collect this information, a number of interviews were conducted. The respondents were in three groups: sales people (defined as someone working at least part of their time with sales), members of the SOA acceleration team and people working with learning and knowledge in the IBM Nordic organization.

Three different interview guides were created for these interviews. They can be found in appendix A. These guides were constructed to understand:

- how the Wiki would be received;
- what would make people use or not use it;
- what sort of information it would be useful for it to provide;
- what incentive models could be used;
- how the Wiki could be managed and,
- how the different respondents rated different properties about information.

According to Davenport (1996), there are six properties that can be used to value of information. They are presented in chapter “3.1.2 Information”. During each interview, the respondent was allowed to rank these properties from most important to least important. The idea behind this was to discover any major discrepancies between the perceptions of the different roles or between the people within the role. The result of these rankings is presented in section 4.2.2.

2.5.1.2 The respondents

In total, seven respondents were chosen. Four of them were sales people, two were from the acceleration team and one was from IBM’s learning and knowledge (L&K) department. All respondents are employed within Global Business Services (GBS), IBM’s consulting division. They are presented briefly in Table 3.

Respondent	Role	Comment
S1	Sales	Head of consulting department, working with sales on C-level ³ .
S2	Sales	Working with sales towards the communications sector.
S3	Sales	Senior consultant. Working with sales in the Small and Medium Business sector.
S4	Sales	Account manager for company within forest and paper.
AT1	AT	Leader of the acceleration team.
AT2	AT	Senior managing consultant. Working in the acceleration team.
LK	L&K	Consultant. Working at Learning and Knowledge.

³ The C-level typically consists of the senior executives; the CEO, CFO, CIO etc.

Table 3: Brief presentation of the respondents.

The respondents were chosen according to a number of factors. Both role (Account manager, senior consultant, consultant, etc) and sector (communications, forest and paper, etc) were taken into account to have a wide set of opinions represented. Most of the selected respondents work with sales; this is because we wanted to develop a good understanding of the needs of the final users of the system. The fact that we developed a good understanding of the acceleration team while working together with them meant that we needed fewer formal interviews with the people working within the team. Only one person from L&K was interviewed. This is because the interview itself was intended primarily to extract some general information regarding knowledge management within GBS; consequently one interview was enough.

2.5.2 Principles

Three principles apply when collecting data: *use multiple sources of evidence, create a case study database and maintain a chain of evidence* (Yin, 2003). The reason for *using multiple sources of evidence* is to enhance the study's validity by showing that the same conclusions can be reached through data collected in different ways, so called "triangulation". Unfortunately due to limitations in time no data triangulation could be performed in this study and we are limited to data and information collected through interviews.

By *creating a case study database* the data collected is kept apart from analyzed material. The purpose of this is to enhance the reliability of the study by allowing others to view the data and analyze it differently. Since our main source of data is interviews, we have kept careful notes of these. We decided not to record our interviews using a recording device as our previous experience shows that this often affects the respondent negatively and that the use of the recordings is very limited when analyzing the interview. We realize that our notes are somewhat subjective, but we believe that this was the better approach.

We have *maintained a chain of evidence* by keeping all interview questions as well as the protocols and notes from the interviews. The idea behind this is to allow other researchers to go through the chain of evidence.

2.6 Validity and reliability

Several measures of a study's quality exists, the most commonly discussed being validity and reliability. Validity is defined as an instrument's ability to measure what it is supposed to be measuring. Validity is divided into two aspects: inner and outer validity. Inner validity measures the congruence between a concept and the measurable definition of the concept (Eriksson & Wiedersheim-Paul, 2001). For example, if a study is measuring how satisfied a

customer is with its supplier, a definition of “satisfied” must be created. Inner validity is defined as how well this definition corresponds to some general notion of what “satisfied” means. What “satisfied” means is obviously subjective and therefore every measurable definition of it will be subjective – one goal of a study should therefore be to find a suitable definition of what is being measured and carefully explain this to the reader.

Outer validity is the congruence between the values received when measuring according to the measurable definition and reality (Eriksson & Wiedersheim-Paul, 2001). For example, if a good definition of “satisfaction” has been created in the study mentioned above, but the device used to measure the customers’ satisfaction was bad, the result would have low outer validity.

Reliability indicates how stable and trustworthy study is. Can the study be repeated by another researcher with similar results (Eriksson & Wiedersheim-Paul, 2001)? Measuring reliability in an interpretative/hermeneutic study is obviously complicated, though some aspects could potentially be interesting. If, for example, a researcher assesses a number of events on a scale, say 1-5, it could be difficult for another researcher to arrive at the same results since she could assess the events differently. In such a case the scale would need be made very explicit, to make the assessment as objective as possible.

At the end of the report the validity and reliability of the findings of our study are discussed. The discussions are presented in the end of the report so that the reader has a better understanding of our findings and how they were reached. These discussions can be found in chapter “6.8.2 Validity” and “6.8.3 Reliability” respectively.

2.7 Generalizability

The problem with Hume’s truism as discussed in “2.1.1 Positivism” implies that the results of a study are not generalizable outside of the study’s sample, regardless of the amount of empirical observations made. An increased number of sources for empirical observations would increase the validity and reliability of the study but not its generalizability. The results would still have to be empirically tested and proven in a new setting to make any claims of validity there. For our study, this would mean that an increased number of interviews would probably give us a better understanding of IBM and its unique situation. Thus, the results would have had a better foundation and therefore be more plausible. However, the increased number of interviews would not make the results more likely to be applicable outside of IBM.

The aim of a purely positivistic study of the KM initiative would be to draw a set of conclusions that would be widely generalizable whereas a purely interpretive study would aim to describe the KM initiative and not necessarily make any claims of generalizability. Since our study is mainly interpretative our focus is to describe this particular KM initiative within its setting at IBM. On the other hand we also believe that the problem of relying too much on a repository supporting a KM initiative is quite common in many organizations and that people outside of the AT who are facing similar problems could probably gain some benefit from reading this report. Note that according to “Hume’s truism” the result of the study cannot logically be generalized outside of its setting, i.e. be applied at another company. However, we believe this perspective is too strict to be of practical use and that the results could be generalized to some extent, even though this is incorrect from a strictly logical viewpoint. The generalizability of the results we arrive at during the study is discussed in more detail in the end of the report in chapter “6.8.1 Generalizability”.

3 Literature study

This chapter starts by discussing the definitions of some important terms and concepts. It then goes on to discuss the theories that are later used in the analysis and finally presents a few models and ideas synthesized from the theory.

3.1 Definitions

The following chapter is used to present some definitions in order to help the reader get a better understanding of some of the different viewpoints on commonly used terms.

3.1.1 Data

There are many different definitions of what data is. Three of them are:

“Observations of the world” (Davenport, 1996)

“Discrete objective facts about events” (Davenport & Prusak, 1998)

“Data can be regarded as the cellular level of an information system that may or may not contribute to a wider understanding”. (Powell & Swart, 2005)

These definitions agree on that data is simple to collect, structure, transfer and quantify. However, data by itself has no value; *“Data describes only a part of what happened; it provides no judgment or interpretation and no sustainable basis of action”*. Since data by itself is worthless there can be a danger in collecting too much of it. If there is too much data to sift through it will become more difficult to find the data that is actually needed (Davenport & Prusak, 1998).

Langefors' (1995) definition is somewhat different. He describes data as *“...signs used to represent information”*. He says that since written language is also signs used to represent information, all language is also data. In addition he says data is the only thing that can be transferred to a new person. (Langefors & Dahlbom, 1995)

Hereafter when we use the word “data”, we refer to basic facts without any context in the same sense as Davenport (1998) i.e. discrete, objective facts about the world.

3.1.2 Information

One definition of information is *“Data that has been imbued with relevance and purpose”*. When humans reflect on and analyze data they can derive information from it (Davenport, 1996). Another definition is *“Data that makes a difference”*. This definition is intentionally ambiguous since something can be extremely useful information for one person but

incoherent numbers to someone else. Information can also be described as a message between a sender and a receiver that has the purpose to change the receiver's opinion regarding something. (Davenport & Prusak, 1998)

Davenport (1996) has presented a set of six attributes he claims decides the value of information.

1. Accuracy - there were no errors when the data was measured and aggregated and the source of the information can be trusted.
2. Timeliness - the information is up-to-date. This can be different for different situations. If the information will be used for strategic planning, it can be old but still useful. If it is used for the planning of the production at a factory for tomorrow it needs to be current.
3. Accessibility - the information should be structured and easy to find.
4. Engagement - the information must be noticeable. For example, should it be presented in a text document, an image or in a video?
5. Applicability - the information can be applied directly to help solve a problem.
6. Rarity - the information can be used to increase the value of a specific company. More common information will probably not be as useful to me as rare information. (Davenport, 1996)

These attributes all discuss what makes the information valuable to a person receiving it, for example the user of some knowledge management system. It should also be noted that these attributes are not independent. For example; if the accuracy of a piece of information's is increased, its general applicability can decrease since it then becomes more specific and bound to its context. This means that it is not a good idea to try to maximize all these attributes simultaneously; a better approach is to assess which attributes are most important in the specific case and try to find a good balance.

3.1.3 Knowledge

"Information that has value" is one definition of knowledge. Persons can give information additional value by giving it a context and meaning with the help of her previous experience. Knowledge is deeper and richer than data and information and can only exist within persons, not in objects. *"One of the reasons that we find knowledge valuable is that it is close – and closer than data and information – to action"*. To have knowledge is to know how to act given specific information. (Davenport, 1996)

Langefors (1995) describes two kinds of knowledge; factual and methodological knowledge. He explains factual knowledge as *"... the knowing of some fact"* which can be used to

interpret a certain situation. Methodological knowledge is then applied in order to decide how to act given the interpretation. Both kinds of knowledge are gained through interaction with and observations of the world and by communicating with others. In addition, Langefors makes less of a difference between knowledge and information than Davenport (1996) and says that “... *information is structured knowledge, structured in such a way that it can be communicated. Furthermore, knowledge that can be communicated can be stored, so information is storable knowledge*”. In order to store or communicate knowledge, it has to be represented with data. In addition, one needs knowledge about a concept in order to be able to interpret the data representation of that concept. For example, the word “car” is only a representation and one needs to know what a “car” is in order to understand what the word signifies (Langefors & Dahlbom, 1995).

Another commonly used taxonomy for knowledge is tacit and explicit knowledge. Tacit knowledge is intangible and difficult to transfer between two persons since the person who possesses it finds it difficult to express it. The difficulty can arise because the person simply does not know she possesses the knowledge or that the knowledge is deeply rooted in conceptual models which the person takes for granted and cannot express in words. An example of tacit knowledge is to know how to ride a bike. Explicit knowledge on the other hand is formal and systematic and therefore more easily articulated and transferable between persons (Nonaka & Toyama, 2003).

Through the interaction with other persons and reflection, tacit and explicit knowledge can be transformed and shared. This allows for new knowledge to be created. The SECI cycle explains these processes, as illustrated Figure 3. (Nonaka & Toyama, 2003)

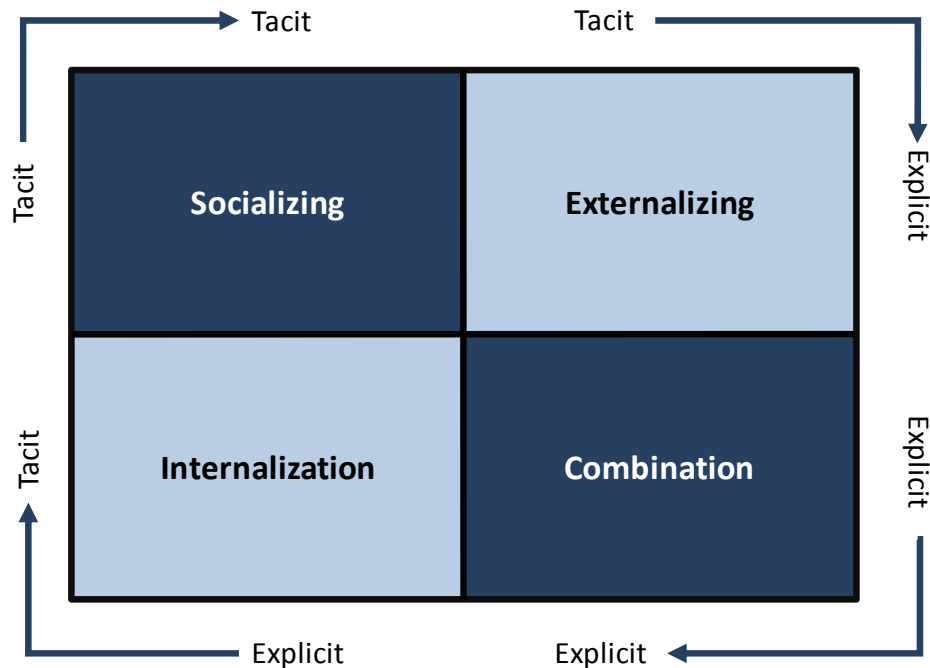


Figure 3: The SECI cycle. Source: (Nonaka & Toyama, 2003)

Socializing is the process where tacit knowledge is transferred to another person and/or new tacit knowledge is created. The knowledge stays tacit during the transfer and thus the person who receives it will still have difficulty expressing it. The person who receives the new knowledge can combine it with his existing knowledge in order to create new knowledge. An example of this process is an apprenticeship where a student watches and imitates the master and thus gains new knowledge.

Externalization is the process when a person transforms tacit knowledge into explicit knowledge or information. This can be done in dialogue with other people in which the person is forced to try to articulate the knowledge, or by internal reflection. The result is typically recorded in a person-independent form, such as written down or recorded.

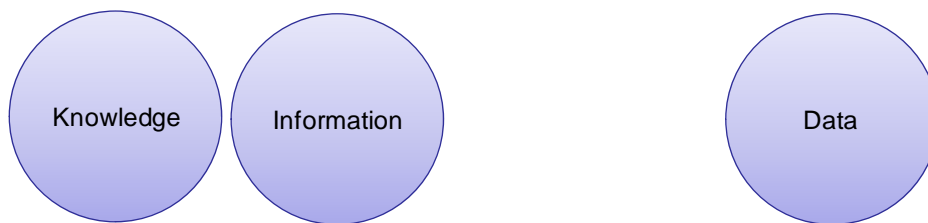
Combination is the process of creating new knowledge by the combination of existing explicit knowledge sources. This can for example be done by taking existing reports created inside and outside of the organization and gain new knowledge by combining their results.

Internalization is the process of converting explicit knowledge into tacit. This can be done by reading manuals and going through training programs. The new tacit knowledge adds to the person's knowledge base and will influence the decisions and actions the person will take in the future.

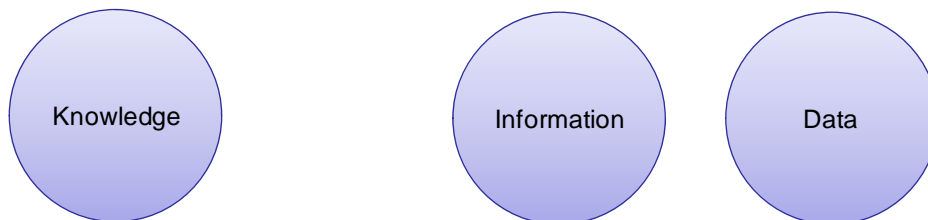
These processes form a spiral where new knowledge is created in each cycle. When one cycle is completed the new knowledge that has been created can be combined with the existing knowledge thus allowing the cycle to begin anew. (Nonaka & Toyama, 2003)

3.1.4 Discussion regarding data, information and knowledge

The different definitions of data, information and knowledge have many similarities but differ on some fundamental levels. One of the biggest differences encountered during our study is how different authors define information. Our view is that the more theoretical definitions (e.g. by Langefors (1995)) states that information is structured *knowledge*. Some of the more practical definitions (e.g. Davenport (1996) and Stewart (1997)) states that information is structured *data*. This difference is illustrated in Figure 4.



Langefors (1995): Information is closer to knowledge than to data.



Davenport (1996) and Stewart (1997): Information is closer to data than to knowledge.

Figure 4: A visualization of the different views on data, information and knowledge.

The taxonomy of tacit and explicit knowledge presented by Nonaka (2003) is quite similar to the one presented by Langefors (1995). “Tacit knowledge” corresponds well with the definition of “knowledge” given by Langefors (1995). “Explicit knowledge”, that is, formal and systematic knowledge that *can* be expressed is related to “information” as defined by Langefors (1995). The difference is that explicit knowledge *has to be* expressed in order to be considered information according to Langefors’ (1995) definition.

When we use the word “knowledge” from now on we mean both tacit and explicit knowledge that *exist within people* as visualized in Figure 5. With “information” we mean

explicit knowledge which *has been expressed* and exists outside of a person, e.g. in a repository. We have chosen this model since we need a way to clearly express the difference between knowledge within people and knowledge that has been physically expressed and therefore can be stored and transferred.

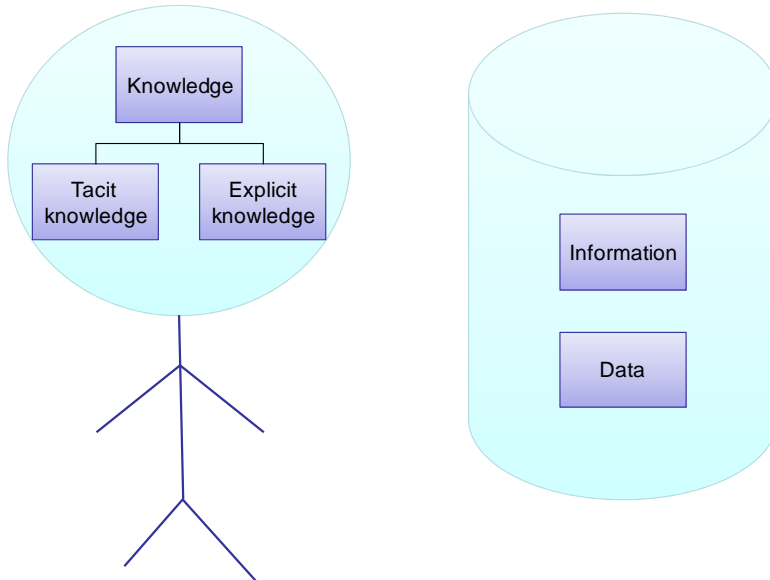


Figure 5: Explicit and tacit knowledge can only exist within people. Repositories can only handle information and data.

The definition we made above states that knowledge is more valuable than information which in turn is more valuable than data. However information and data are easier to transfer since this can be done with the help of computerized systems. Knowledge can only be contained within persons and is thus more difficult to transfer to another person. This concept is illustrated in Figure 6.

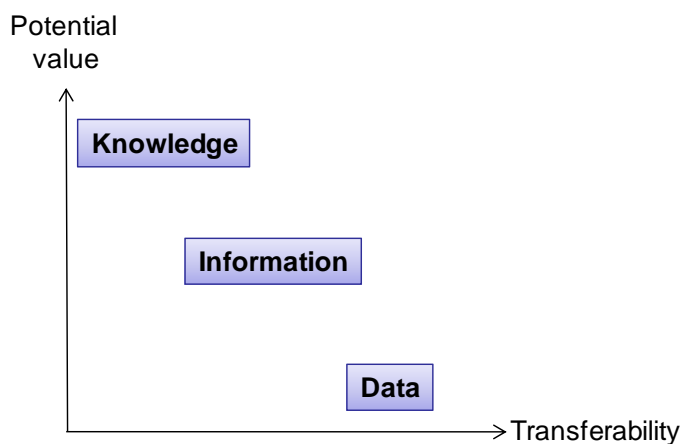


Figure 6: Illustration of the potential value and transferability of knowledge, information and data.

3.1.5 Intellectual capital

As with data, information and knowledge there are many different definitions of intellectual capital. One definition is presented by Klein & Prusak in Stewart (1997) and defines intellectual capital as *“intellectual material that has been formalized, captured and leveraged to produce a higher valued asset”*. This means that phone numbers which are memorized by people are considered intellectual material, but when they are written down to create a phone book it becomes intellectual capital. Another definition is *“knowledge that can be converted into profit”* (Harrison & Sullivan, 2000). Yet another definition, but quite similar to the second one, is given by McConnachie (1997) who makes a difference between intellectual capital, *“knowledge of potential value”* and intellectual assets, *“knowledge defined for a particular purpose within a particular context”* (McConnachie, 1997).

The difference between these definitions is whether the knowledge and information needs to be codified in order to be classified as intellectual capital. We use the broader definition by Harrison & Sullivan(2000) and McConnachie (1997) since we believe that any knowledge and information may be of value to an organization, whether it is codified or not.

Furthermore intellectual capital can be divided into two sub-categories; human capital and structural capital. Human capital is the knowledge and skills of the people within an organization. This kind of capital cannot be owned and the organization loses some of its human capital every time an employee leaves. Structural capital are the assets which can be used to create value and that stays with the company even if people leave the organization, for example databases and formalized processes. The structural capital is created by the people within an organization but owned by the organization and can create value by being used to speed up the work and help the members deliver consistent results. This categorization is illustrated in Figure 7. (Edvinsson, 1997)

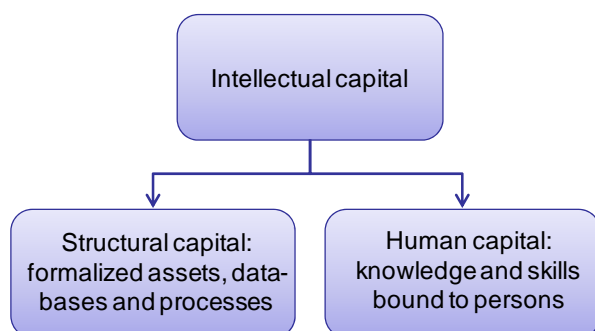


Figure 7: A general breakdown of intellectual capital.

3.1.6 Mintzberg's professional bureaucracy

A professional bureaucracy is one of the five organizational configurations described by Mintzberg. What defines this kind of organization is the fact that the employees themselves decide, to a very large extent, what they need to do. In general the employees are well educated, knowledgeable about their field of work and value their time highly. This kind of configuration is common in organizations providing professional services in close contact with its customers. The employees in professional bureaucracies typically identify themselves with their profession, sometimes making them more loyal to their own profession than to the employer. (Bruzelius & Skärvad, 2004)

3.1.7 The invisibility of intellectual work

Suchman (1995) says that one thing that makes intellectual work and services different from traditional labor is that it is difficult to determine what kind of competences and skills the person performing the said service require. It is also difficult to determine how much time and resources an employee needs to produce the results. Suchman (1995) states "*In the case of many forms of service work, we recognize that the better the work is done, the less visible it is to those who benefit from it*". This means that work that seem very trivial can actually be both difficult and time consuming. Suchman's (1995) example describe employees at legal firm whose jobs were perceived as trivial. However, when studied more carefully, it was found that these employees made important interpretations and judgments on a daily basis, though this was not realized by the attorneys of the firm. Thus, it is important to remember that detailed knowledge of a person's work is needed to understand its full scope. (Suchman, 1995)

3.2 Knowledge management

The term knowledge management is not clearly defined. Most of the definitions found are phrased differently but have many similarities. A few of the general definitions encountered during the literature study are presented below:

"a discipline that systematically *leverages* content and expertise to *provide* innovation, responsiveness, competency and efficiency"

"Knowledge management is nothing more than managing information flow; *getting the right information to the people who need it so they can act on it quickly*"

"the *production, mediation, and use* of knowledge; the management of intellectual capital"

"the *coordination and exploitation* of organizations knowledge resources, in order to *create benefit and competitive advantage*" (Call, 2005). (Italic added by the authors for emphasis)

“The objective of KMS is to support *creation, transfer, and application* of knowledge in organizations”. (Alavi & Leidner, 2001)

The emphasized words show a pattern in the definitions. It seems that KM is typically about collecting knowledge (*production, creation (of explicit knowledge)*), transferring knowledge (*provide, mediation, transfer, coordination, getting the right information to the right people*) and using knowledge (*leverage, act on it, use, exploitation, create benefit, application*). It seems that knowledge once collected can be transferred and then used. When knowledge is used, new knowledge can be created, codified and then shared. This creates a cycle of Collect -> Transfer -> Use -> Collect. We call this the Knowledge Management Cycle and it is illustrated in Figure 8. Given the words chosen to describe the stages in the cycle, it could be interpreted as being valid mainly for knowledge management initiatives using repositories. Rather, we believe that this is a generic cycle that can be used to describe any initiatives aiming at managing knowledge according to the above definitions. We also believe that for a knowledge management initiative to be successful, all stages must be conducted in some form and to some extent.

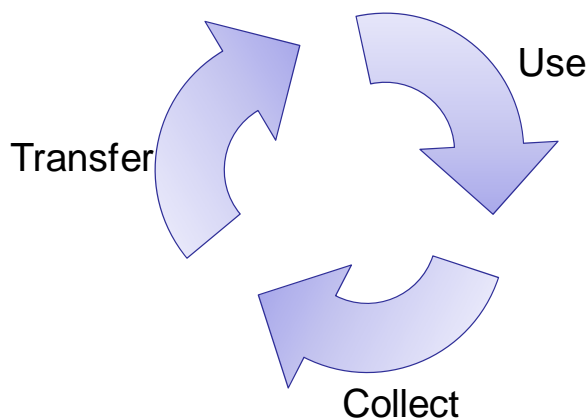


Figure 8: The Knowledge Management Cycle.

Collect

The “collect”-stage of the cycle includes a number of different activities. On a general level this stage includes the discussions and decisions regarding which kind of knowledge and information that is important for the organization and what it should help them achieve. On a more practical level this stage includes codifying knowledge within the organization. With codifying we mean the activity of making knowledge easier to transfer between persons. This might be done by converting it to a more transferrable form, i.e. to information or data, or simply by encouraging interaction between persons within the organization. The actual

collection can be carried out in a number of different ways, for example interviews with project participants, encouraging people to document their experiences in repositories or by keeping their notes in a systematic way.

Transfer

The “collect”-stage should enable efficient transfer of information and knowledge to persons. With the “transfer”-stage we mean the actual activity of transferring data, information or knowledge from either a person or a system to another person. It can be done in a multitude of ways, for example by accessing repositories and reading texts, having face to face discussions or conducting phone conferences.

Use

When persons have gained new information and knowledge from the “transfer”-stage their knowledge base has increased. We define the “use”-stage as when this new knowledge, together with any existing knowledge, is applied to a task in order to solve it more efficiently. In this stage we also see the largest potential for creation of new knowledge, which can then be collected in the next iteration of the cycle.

But when is knowledge created? We do not believe that knowledge creation is an isolated stage in the cycle but rather that knowledge can be created in all the different stages. However, according to the SECI-cycle, new explicit knowledge can be created by combining existing explicit knowledge; this would correspond with the collect and transfer stages of the KM cycle. Tacit knowledge is created by socializing and this can occur in the “transfer”-stage and the “use”-stage of the cycle.

Please note that the KM cycle describes knowledge management in general. The “use”-phase consists of persons applying knowledge in a specific task, and not *using* a repository or any other technical system that exist to support the cycle. Accessing a repository to gain new information would be a part of the “transfer”-stage of the cycle.

3.2.1 Achieving effective knowledge sharing using repositories

The KM cycle we presented in the previous chapter is a very general model of the different areas which to some extent may exist within any KM initiative. Specific initiatives can be quite different and focus on different parts of the KM cycle. A common type of KM activity is knowledge sharing. The aim of those projects is to codify tacit knowledge in order to share it with more people within the organization (Davenport, De Long, & Beers, 1998). In this chapter, knowledge sharing using knowledge management systems and repositories is discussed.

There are three common types of knowledge management systems (KMS). One is the coding and sharing of best practices, a repository used for internal benchmarking with the purpose of sharing effective work processes. The second is the creation of corporate knowledge directories which are organization-wide “Yellow pages”, containing contact information for all the organization’s members. In addition to contact information it can also contain the members’ interests, areas of expertise and similar information in order to help the people find the person with the knowledge they are looking for. Finally, the creation of knowledge networks is common. These are formal groups where specific areas of knowledge are discussed. (Alavi & Leidner, 2001)

The area of knowledge sharing using information repositories has been discussed and studied carefully. Many authors have examined different initiatives and a number of critical success factors have been identified. Some of them are presented below.

First, it is important to model information repositories in accordance with the user’s own processes. Since the user is already familiar with her own process, the likeliness of her using the system is larger if the repository is modeled closely after that process, using the same steps as the process. (Collison & Parcell, 2005)

Egbu (2004) has examined a number of KMS initiatives and claims that a clear purpose and a shared language are very important when working with knowledge management. He also claims that the technical infrastructure is important and that systems not only for storing information are necessary, but also technical systems for communicating, such as intranets and videoconferencing. Finally, he also concludes that education and formal training are important when trying to initiate a KM system. (Egbu, 2004)

Problems arising when working with knowledge management systems have also been studied and discussed by a number of authors. According to Christensen (2007), some of the most common problems identified are:

1. **Stickiness of knowledge.** Tacit knowledge is inherently difficult to express and require time and resources if it is to be shared.
2. **No common identity.** The sender and receiver of the information have difficulty understanding each other. This can be quite common when trying to share information between members of two different specialist groups, since they usually have different frames of references and internal language.

3. **No relation between the sender and receiver.** In order for information to be shared a connection between the sender and receiver need to be made. If no connection can be made, no information or knowledge can be shared.
4. **No willingness to share.** The culture within an organization can make its members unwilling to share their knowledge with the other members.
5. **No knowledge of knowledge.** If a person who has a lot of knowledge is unaware that other people need it will be more difficult to initiate a transfer. (Christensen, 2007)

According to Milton (2007), many organizations are too unfocused and passive in their work with knowledge management. Popular initiatives like sharing lessons learned from previous projects require them to have run into problems in order to learn any lessons; with proactive KM many problems can simply be avoided. Similar initiatives usually only manage the knowledge that is the most visible. Organizations should instead take a more proactive approach to knowledge management and define what kind of knowledge is important to them and how they can use it to help them in their work. By focusing on the knowledge that is important for the organization they can significantly improve the value gained from the KM initiative. (Milton, 2007)

Since there are very different kinds of KM initiatives it is very difficult to define what makes an initiative successful. Knowledge is a intangible asset and it is very difficult to measure the effects of it on the organization. (Davenport, De Long, & Beers, 1998) This typically means that organization can only quantify the cost side of a knowledge management initiative, making it much easier to see the costs than the benefits. When evaluating such an initiative, this must be taken into consideration.

3.2.1.1 Media richness

The media richness theory discusses different media having different potential for the transfer of information and knowledge. Leaner media, such as mass e-mails and numerical documents, have a lesser potential of transferring information than richer media such as telephone conversations and face-to-face meetings. Some factors that affect the media richness are its capacity for immediate feedback and the number of cues and channels available. Face-to-face meetings are richer than e-mail because the receiver can ask questions immediately if there is something she does not understand. The receiver also gets additional information from the senders tone of voice and body language, something that is lost if the same message is sent via e-mail (Daft & Lengle, 1986). Tacit knowledge can only be transferred by socialization, which is sharing an experience (Nonaka & Toyama, 2003). This shared experience can be visualized as the apprentice watching the master, asking questions and being guided. To achieve this shared experience a very rich media is required.

3.2.2 Knowledge sharing and motivation

Different people are motivated by different incentives. Some people want tangible rewards while some people share their knowledge unconditionally (McLure Wasko & Faraj, 2000). A common taxonomy for incentives defines three general kinds, moral, social and economic. A moral incentive is simply a strong belief that it is the right thing to do (*"I should really recycle so that I don't contribute to global warming"*). Social incentives come from the expectations of and pressure from other people (*"I should recycle so that other people don't think I don't care about global warming"*). Finally economic incentives arise when a promise of a reward or fine is made. The reward or fine does not have to be purely monetary (e.g. cash) but compared to the moral and social incentives it is much more tangible, i.e. "If you don't stop coming in late you will be fired" is much more tangible than "If you don't stop coming in late your colleagues will think less of you". Although the moral and social incentives are not as tangible as economic incentives does not mean they are any less powerful. For example, in some states in the USA the authorities have begun publishing names and photographs of the persons who are convicted for a number of different crimes. The belief is that the shame (social incentive) is a stronger incentive than any fine (economic incentive) could be. Naturally some actions are motivated by a combination of different incentives. (Levitt & Dubner, 2006)

One interesting aspect regarding economical incentives is that they can actually decrease the motivation to perform a specific task if the reward or fine is not large enough. The motivation provided by moral and social incentives is highly subjective and very hard to quantify or measure. If an economic incentive is introduced it is easier to assign the activity a specific value. An experiment with day care centers showed that the number of parents who arrived late for picking up their kids *increased* after a \$3 fine was imposed for late pick-ups. Before the fine was introduced the parents were affected by moral and social incentives since they knew they were treating their children and the employees at the day care badly. After the fine was introduced the moral and social incentives was replaced with an economic incentive; the parents could buy themselves out of feeling guilty for the cheap price of \$3. The economic incentive created by the \$3 fine was much weaker than the moral and social incentives it had replaced and thus, the number of late parents increased. If an economic incentive is to be introduced it is important that the magnitude of the reward or fine is big enough not to belittle the activity it should promote. (Gneezy, 2003)

3.2.3 Governing the knowledge management initiative

Governance of knowledge management systems can include many things, but they typically center on the responsibilities for adding to and maintaining the information in the system. Existing KMS needs governance in order to keep providing any value to the organization

(Collison & Parcell, 2005)(Adelman & O’Niel, 2007). Any information in a database will eventually become too old to be useful and needs to be updated or replaced. In general there are two different ways of doing this. The first one is to have experts employed and let them handle the governance of the KMS. The second way of doing it is letting the users of the KMS manage its contents.

If experts handle the governance of the KMS the information it contains will be more reliable and hopefully be of greater value to the users, since the experts by definition are the one with the best knowledge of what is needed. One danger is that if the group of experts who handle the KMS is too small their perspective can be too narrow and they can limit the information that is published to that which is interesting to them (Collison & Parcell, 2005). If this happens the other users of the KMS can find it less useful and eventually stop using it. If the users manage the contents of the system a greater speed and flexibility will be achieved. One problem that might arise is that the information is less reliable; the many different people who manage the contents will probably have different views on what the correct definition of terms is and what kind information that is useful. The users might also misunderstand some terms and publish information that is incorrect or outright dangerous to act on. (Adelman & O’Niel, 2007)

“Governance lite” is a concept where the two different kinds of governance are combined. Any user can add or modify the contents in the KMS but it will then be flagged as “user contributed”. The role of the group of experts is then to verify the new entries and either approve or discard the changes. If the changes are approved the “user contributed” flag will be changed to “authorized”. This enables the speed and flexibility of the system to be retained while the reliability of the contents can be improved. This kind of governance puts a lot of responsibility on the users since they have to judge the credibility of the newly added information before the experts authorizes it. They will have to assess themselves whether the information can be relied upon, or they wait for the experts to verify the material and flag it as “authorized”. Also, the processes the users have to go through to add content to the system cannot be too complicated or it will deter them from sharing their knowledge. (Adelman & O’Niel, 2007)

3.2.4 Knowledge managers

Who should be responsible for the KM within an organization? Knowledge manager is a common and loosely defined term for managers who have some kind of responsibility for the knowledge within an organization. The responsibilities of a knowledge manager can vary greatly and can depend on the kind of organization and its culture, among many things. (Davenport & Prusak, 1998) (Stewart, 1997)

A librarian is a quite common kind of knowledge manager. Her responsibility is to help the other members of the organization to find information and persons with the knowledge they need. Librarians have normally been working within the organization in order to be considered credible as sources of information. There are some disagreements to using the term librarian for this kind of work. When Stewart (1997) uses the word he says the librarians work proactively by seeking out persons involved in new projects. Davenport (1998) on the other hand think that the word librarian implies a passive role, the members of the organization need to contact the librarian themselves in order to get help they want. A potential drawback according to Davenport's (1998) definition is that the librarians may also be too occupied with being good librarians by protecting their information in order to keep it structured and that they may become too focused on storing the information and not enhance and share it (Davenport & Prusak, 1998). No matter what definition is used a librarian need an organization with a knowledge oriented culture where people are willing to share their knowledge in order to produce value. In addition they need funding and their effect on the business is very difficult to measure (Stewart, 1997) (Davenport & Prusak, 1998).

The goal of KM is to develop sources of knowledge and help members of the organization to understand and use information. This means that the knowledge managers need to be more than just passive librarians. It is a complicated task which requires understanding of the business, IT, the internal politics and culture as well as knowing what useful sources of information are available. (Davenport & Prusak, 1998)

If the knowledge managers also are responsible for maintaining the system as well as the contents a problem that can arise is that they give too much focus on the technology and functions of the system when it really is the content of the system that is actually valuable. One solution to this problem is to have some persons handle the content of the system (content editors) and others who manage the technical aspects. (Davenport & Prusak, 1998)

We believe that the tasks of a knowledge manager are to identify, filter, sort and publish important information. This means her tasks are primarily those of a librarian and content director. Another important aspect of the knowledge manager is her credibility. It is important to remember that how the information the knowledge manager provides is perceived is affected by her political standing within the organization. Therefore, it is important that the knowledge managers are credible and have a strong position within the organization.

3.3 The value of knowledge management

KM and KMS creates no value for an organization by themselves. Knowledge only generates value when it is applied by members of the organization. A KMS can have *potential* value, based on its content – a knowledge management system with a lot of useful information is worth more than a knowledge management system whose contents are of poor quality. However, neither of those KM systems can create any value by themselves, though the first one has a larger potential for creating value. This is the concept of structural capital – just as normal capital (a building for example) does not itself create value, but rather can be used to create value, so can structural capital create value when being used.

It is important to make the distinction between the structural capital stored in a KMS, the human capital stored in a person and the value actually created by people applying knowledge in their activities.

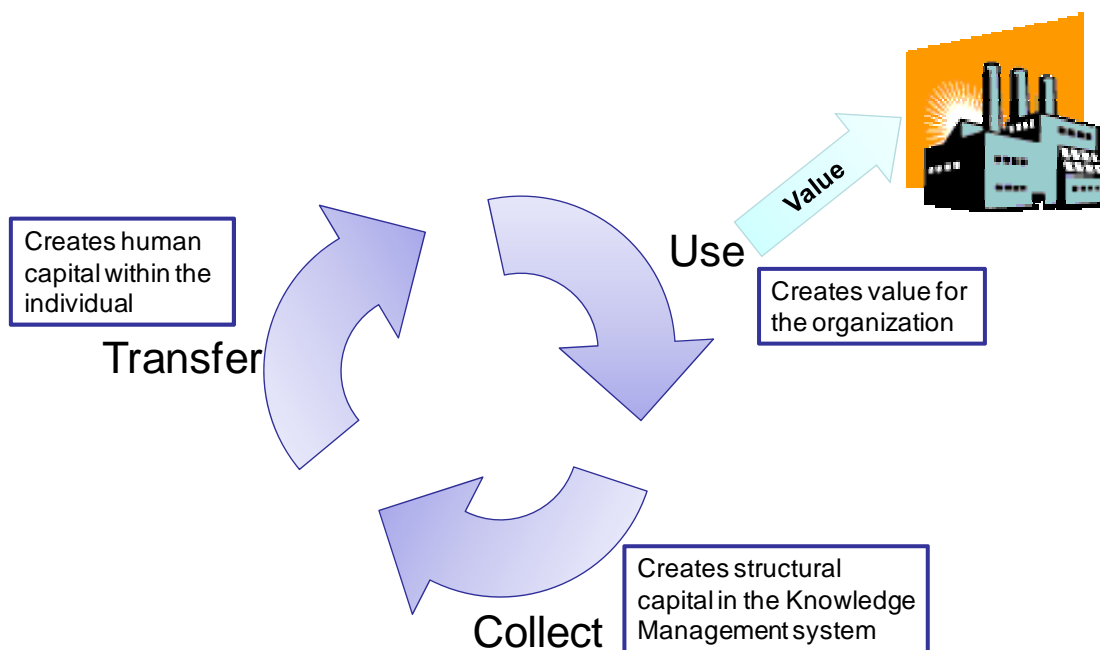


Figure 9: Value is only created when knowledge is used.

Figure 9 shows the value and potential value created in the KM cycle. In the collect stage, structural capital is created when knowledge is codified and stored in a repository. In the transfer stage, human capital is created within the individual to whom the knowledge is transferred. Finally, when the individual applies the knowledge, actual value is created for the organization.

As discussed in the delimitations, this report does not discuss specifically how knowledge should be used, that is, how the people possessing the knowledge should apply it in their tasks. This means that the processes for managing this are not described. Instead the focus is on increasing the structural and human capital at IBM.

3.4 The OPR model

During the literature study, we discovered that there seems to be a gap between the organization and the repository in the typical repository scenario, as illustrated in Figure 10. This gap manifests itself through a lack of knowledge of and interest in the repository. A common scenario seems to be that an organization implements a repository without a concrete understanding of how the repository is to be connected to the organization (Markus & Benjamin, 1997)(Collison & Parcell, 2005)(Christensen, 2007). After much consideration, we believe that carefully crafted processes can bridge the gap between the organization and the repository. These processes can vary greatly depending on the organization and the repository, and therefore a general framework was created for identifying the needed processes.

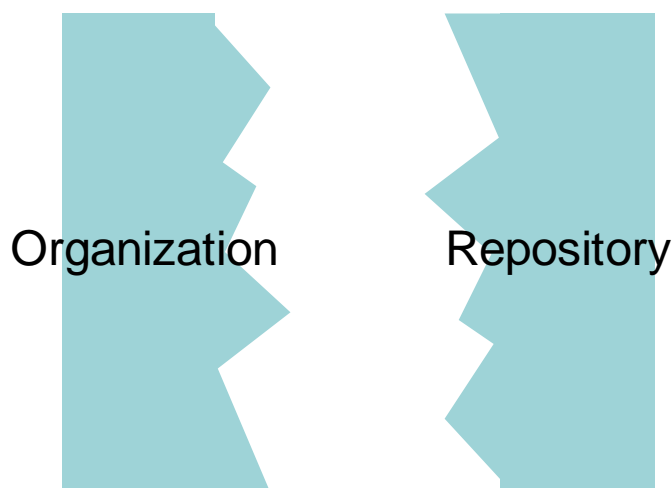


Figure 10: Organization and repository without processes.

In order to develop this framework we needed to understand what the processes need to accomplish, and for this, we turned to theory. By studying a number of relevant articles and books, we tried to find common problems and critical success factors and categorize them. This work stretched over an extended amount of time and a number of different models and categorizations were created but eventually discarded. Finally we were able to identify four general areas that seemed to include all of the important aspects, critical success factors and common problems presented in the literature.

These areas are *enablement*, *motivation*, *governance* and *content*. We have decided to refer to these areas as *areas of requirements* since they are areas that require consideration when launching a repository. Some sources of these areas can be found in Table 4.

Area	Source
Enablement	(Davenport, 1996)(Stewart, 1997), (Borovits & Neumann, 1986)
Motivation	(Collison & Parcell, 2005), (Adelman & O’Niel, 2007), (Petri, 2001)
Governance	(Stewart, 1997),(Adelman & O’Niel, 2007)
Content	(Stewart, 1997), (Milton, 2007), (Collison & Parcell, 2005), (Christensen, 2007), (Powell & Swart, 2005)

Table 4: The requirements of the processes

We realize that these four areas of requirement are not necessarily completely exhaustive. They are limited by the authors’ understanding of knowledge management, by the situation of trying to bridge the gap between an organization and a repository and ultimately by IBM’s unique context within this kind of situation. However, we do believe that they are four important areas and we have not been able to identify additional areas by studying IBM or our literature. Also when we applied the model on our empirical study we had no difficulty categorizing each KM related statement from the interviewees under one, and only one, of the four areas. This implies that the four areas cover the most common aspects of KM and does so without overlapping each other.

Enablement - With the processes relating to enablement we mean the processes which let the users access and use the system as intended. This includes for example training, support and availability of the system.

Motivation - In order for the system to provide any value, users must both provide information which will be stored in it as well as access it and find new information in it. The processes affecting motivation should make sure that there are enough incentives for people to use the repository.

Governance - With governance we mean the processes which relate to the responsibilities for managing the contents of the repository. Who should be responsible for adding new information to the system? Who should be responsible for maintaining the information and make sure it is of high enough quality and still relevant? This definition is quite narrow; sometimes governance is also said to include elements of motivation. However, we have chosen to define governance and motivation as two separate areas.

Content - The processes relating to content handles the decisions regarding what kind of information should be stored in the system. What is the purpose of the information and what kind of tasks should it help the users with?

These areas are used as a basis in the analysis of which processes are needed in the specific case. Ideally, the processes serve as a bridge between the organization and the repository, as illustrated in Figure 11.

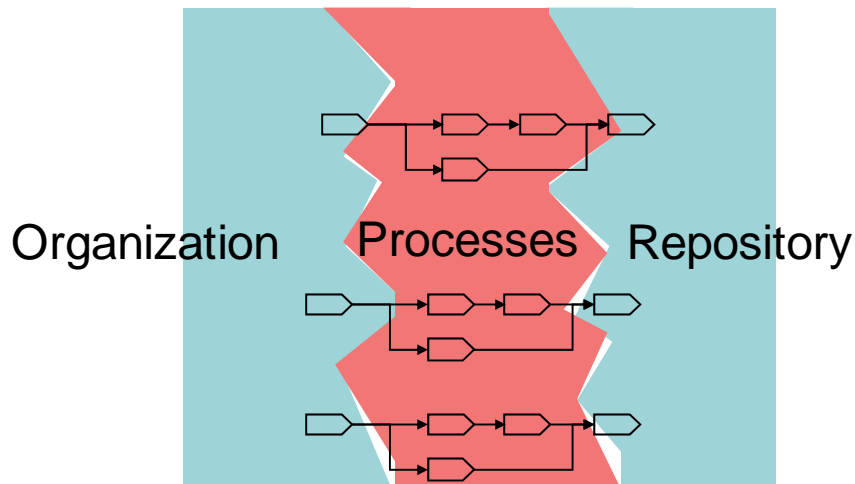


Figure 11: The organization connected to the repository using the right set of processes.

4 Investigation

This section of the thesis is meant to describe the information collected during the study. Most of the information was collected during interviews with a total of seven respondents. Also, the information about IBM and a number of programs and initiatives within IBM was collected using publicly available sources. Whenever a source is not cited below, it is because the source is on IBM's intranet and therefore not publicly available.

The first part of the section describes IBM and a number of programs and initiatives at IBM that are later used in the discussion. The second part contains an in-depth discussion of the information gathered during the interviews conducted.

4.1 IBM - Some important programs and initiatives

In this section, IBM and a number of its programs and initiatives are described.

4.1.1 The basic facts on IBM

IBM is the world's largest information technology employer. Currently, it employs around 350 000 people worldwide, having an annual turnover of around 90 billion USD. IBM has a wide array of services and products including hardware, software and consulting services. It is one of the few information technology companies with a long history; it was founded in 1889 in Armonk, New York. (Wikipedia - IBM)

IBM is a technology driven company – in 2005 it had 2941 patents which is more than any other company (Ibm.com - Background). They consider their capability to find new uses of technology and transform them into business value one of their core strengths (IBM, 2006).

4.1.2 Personal business commitment

IBM's single most important people management tool is the Personal Business Commitment (PBC). The PBC is a set of goals that each employee sets each year, together with the responsible supervisor. The supervisor makes sure that the employee's goals are aligned with the department's goals, which are aligned with the division's goals, which in turn are aligned with IBM's goals. The PBC is thus the last step of an organization wide goal breakdown structure that assures that each employee's goal is aligned with the corporate wide goals.

At the end of the year, the employee is evaluated on how well the personal goals were met. The employee is responsible for recording achievements during the year in a specific database that the manager uses during the evaluation. The evaluation places each employee

in a category based on relative performance. This means a specific percentage of the employees are rated as “top performers” each year. The idea behind this is to not only motivate people to fulfill their goals, but also to perform better than their peers. This, according to IBM, fosters the sought “top performer culture”.

4.1.3 Individual development plan

The PBC does not include personal development. For example, an employee needing to improve his presentation skills would not enter this in his PBC. Instead, this goes into the Individual Development Plan (IDP). The IDP is created after a career discussion between an employee and her manager and is renewed each year.

4.1.4 The SOA Acceleration Team

IBM’s strategic management has identified SOA as a strategic area for IBM. It is believed that IBM has the right resources to become the most important player worldwide in SOA. In order to raise the awareness about SOA within IBM, the SOA acceleration team has been created. The team has several purposes. First, it is responsible for helping to spread information about SOA within IBM. Members of the team are also supposed to hold expert roles in SOA related projects and sales activities. Finally, it is also responsible for the different education initiatives around SOA. The SOA acceleration team is a global team and is divided into local teams across different geographic areas. The team referred to in this thesis is the Nordic acceleration team, consisting of ten people in the Nordic countries.

4.1.5 Learning & Knowledge

Learning & Knowledge (L&K) is a subdivision of GBS. It is responsible for education programs within IBM as well as for facilitating knowledge sharing. One of their more ambitious initiatives is called “Knowledge View”. This is a large database containing assets and information collected from various projects executed by all sections of GBS. Employees within IBM can access this database and gather information which can help them when executing or selling projects similar to the ones described in Knowledge View. This makes Knowledge View very similar to the database created by the authors, but on a much larger and wider scale.

Among L&K’s other responsibilities are mapping communities of practice and their members to make it easier to get in contact with experts or people who share your interests and work tasks. At the moment are 841 different communities of practices registered at their webpage. The number of members in each community varies greatly, from no more than 20 in the smallest to several thousands in the largest. L&K also provides benchmarking information on a multitude of different factors across many different industry sectors.

4.1.6 Wiki Central

The Wiki central is a web space where employees can register to create a Wiki. The scopes and purposes of the wikis vary a lot - some are created to support the work on a project and is used privately by just a few members involved in the actual project. Others are public and functions as the base of communication for the larger communities of practice.

4.2 Review of interviews

The notes from each interview were analyzed and all statements made were categorized into the areas of requirements: Enablement, Content, Governance and Motivation, according to the theoretical framework developed in “3 Literature study”. All knowledge management related statements that were documented during the interviews could be categorized in one of these four categories. The questions for the interviews were devised before the theoretical framework was completely developed which means we did not have the areas of requirements in mind when we devised the questions. The fact that all KM-related statements could fit in one of the areas indicate their validity. However, some of the interviews were conducted after the framework was completed which could have led us to subconsciously filter out statements that could have been relevant but that did not fit into our framework.

When the statements from all the respondents had been categorized into the categories above, a careful comparison within each area was made. When identical or very similar statements had been done by two persons or more, they were grouped together as one statement. The purpose of this was to reduce the amount of data to analyze and create a more cohesive image of the data collected. The statements can be found in Table 5 through Table 8. Each area has then been divided into sub-categories in order to break down the data even further. The division has been done according to the statements made, so that each statement falls into one single sub-category.

The “**Content**” area has been divided into three categories:

Purpose – statements about the purpose of the specific information;

What information – statements regarding which specific information is needed for each case;

Properties – statements about which properties the information should have.

Sub-category	Statement	Respondent
Purpose	Having reference cases available is important for the sales process	S1, S2, AT1, AT2

Purpose	Having cases available is valuable when preparing for a sales pitch. It is important to know about previous approaches and conditions for different countries and industry sectors.	S2, AT2
Purpose	Sales people want to get in contact with other sales people to get information for sales pitches.	AT2
Purpose	A reference case is most valuable if it is from the same industry or sector as the sales pitch for which it is to be used.	S4, AT1, AT2
What information	Presentations and general descriptions of the project including architectural descriptions and price calculations are useful.	S1, S2, S3, S4
What information	Examples of business value created in a project is valuable – both qualitative and quantitative.	S1, S4
What information	It is valuable to know how large an investment the project was to the customer, the background of the project, the balance between IBM consultants and the customer’s people, how involved the customer’s business side was and the critical success factors.	S1
Properties	Less is more – information should be short and concise. Rather too short than too long.	S1, S2, S3, S4

Table 5: Statements categorized into Content.

The “**Enablement**” area has been divided into:

Internal selling – statements regarding how the Wiki is to be marketed and communicated internally;

Adding information – statements about how people should be enabled to add information to the Wiki;

Finding information – statements about how people should be enabled to find information in the Wiki.

Sub-category	Statement	Respondent
Internal selling	Selling the Wiki internally is important if people are to use it.	S4, AT1, AT2
Internal selling	It is important to make the Wiki as visible as possible – a link at the intranet’s start page would be good.	AT2
Internal selling	It is hard to find good databases and also to communicate new ones that have been created.	S3
Adding information	If people are to add information themselves, there need to be good guides and policies.	S4, AT2
Finding information	A good structure and search capabilities enhances a Wikis value.	S1, S4
Finding information	There are vast amounts of information and databases at IBM, making it more difficult to find what you need.	LK
Finding information	Since there is a huge amount of information available within IBM, it is hard to create confidence for any specific piece of information.	LK

Table 6: Statements categorized into Enablement.

The “**Governance**” area has been divided into:

Adding information – statements about who should add information and how it should be done;

Validating information – statements about who should validate and maintain information added to the Wiki.

Sub-category	Statement	Respondent
Adding information	Two people at IBM Nordic are working with harvesting information from projects by interviewing project members, using special checklists. The results are documented in Knowledge View. These people typically have a consultant background	LK
Adding information	Opportunity owners must be responsible for documenting the case, since they are involved in the whole project, from sales to delivery.	AT1
Adding information	The acceleration team’s members have difficulties finding time to work with collecting information.	AT2
Adding information	It would be interesting to automate the collection of information gathering. Perhaps a mail form could be used – “please submit your case here”?	AT2
Adding information	If sales people were to add new information to the Wiki, the quality would be too low and uneven. Someone has to work specifically with collecting information.	S1, S4
Validating information	It would be hard to find someone who would find it interesting to work with maintaining the Wiki. Could it be done from an Indian delivery center?	AT1
Validating information	A junior consultant could probably maintain the Wiki if given about one day a week.	AT2
Validating information	The members of the acceleration team must have good knowledge of what is in the Wiki in order to be credible.	AT2

Table 7: Statements categorized into Governance.

Finally, the “**Motivation**” area has been divided according to Levitt’s (2006) incentive taxonomy. Each statement refers to some type of incentive and has therefore been placed in that incentives sub-category. The sub-categories are:

Economical – statements regarding all incentives that are related to a person’s economy, e.g. if a person achieves her PBC goals or are economically rewarded.

Social – statements about social incentives such as when a person avoids doing something she believes her peers would dislike;

Moral – statements about moral incentives such as when a person does something she wants to do because she believes it is the right thing to do.

Sub-category	Statement	Respondent
Economical	PBC is each person’s goal and should be used for motivation. It is connected to salaries.	LK

Economical	PBCs can be used but it is hard to measure knowledge work. It is better suited for things that can easily be quantified.	S1
Economical	PBCs would be the classic IBM way, but it won't work here. An award for contributing to the Wiki would be better.	S3
Economical	The control system is mostly about the amount of billed hours, making it hard for employees to prioritize knowledge work.	LK
Economical	If sales people find that the system will help them fulfill the goals in their PBCs, they will use it.	S1, AT2
Economical	Documentation of project is supposed to be done within the frame of the project. Project management is responsible.	LK
Economical	If documentation is to get done, it has to be done within a process. There are no processes outside of projects – therefore the documentation must be done as a part of a project's process. Consequently, the documentation must be a part of each project.	AT1
Economical	Obligatory never works! The sales people are important people; they will prioritize their own way.	AT2
Economical	I would probably contribute to a Wiki, just in order to promote myself, the work I do and my customers.	S2
Moral	People really want to help and contribute, but they feel they don't have the time.	S1, LK
Social	If you ask someone, they will most likely help you, especially if you call them rather than email.	AT2, LK

Table 8: Statements categorized into Motivation.

4.2.1 Review of the areas of requirements

In this section, each area of requirements is discussed in some detail. Using the statements from the interviews, we try to conclude what opinions have been presented within the categories and if there seems to be a consensus or if a range of opinions are represented.

4.2.1.1 Content

Most respondents agree that having reference cases is important when selling new projects. These reference cases are most applicable if they are within the same industry sector or country as the project for which it is used. According to the respondents, these reference cases can be used in two ways. First, they can be used to prepare to meet a customer – then they need to contain information on the approach taken and how the customer was convinced. Secondly, a case can be used to show to the customer what positive effects a similar project had and the benefits achieved by the customer. In that case, it needs to contain details of the results of the project and information on the customer's own work in the project.

The acceleration team also believes that that sale people would appreciate the possibility to identify other sales people working on similar projects. The sales people seem to support this, though none of them have specified it as an important without being asked directly.

This discrepancy between sales people and the acceleration team could stem from the fact that contacting other sales people for information is something most sales people do every day and they therefore consider it a natural part of their work.

There is also a major consensus that most cases are too long, too hard to read and too specific. In one interview, the phrase “..we don’t need the typical 100 slides presentation..” was used. Rather, it seems that the sales people need short and general information on cases.

4.2.1.2 Enablement

The acceleration team and some of the sales people believe that it is important to sell the Wiki internally. One of the sales people agrees that this is important but also very hard to do since there are so many database initiatives for different things. The L&K expert commented that there are vast amounts of databases and information available through the intranet, making it more important to provide good search tools.

One person from the acceleration team thinks that a visible link on the intranet could drive sales people to the Wiki; several of the sales people talk about being able to find information from the Wiki when using the intranet search engine. It is quite evident that the acceleration team does not fully understand how the sales people search for information. The acceleration team seems to be under the impression that one Wiki could contain enough information for the sales person, being a “one stop shop” for all SOA related information. The sales people rather work by using many sources and combining information from these sources. Working like this, they cannot look through each source separately for what they are looking for, but rather need to search for it using a search engine.

Typically, when combining information from many sources, they have trouble knowing how reliable the material they find is and what the intended use of it is. Sometimes, the material is marked with the author’s name, but often it is not. This leads to that the sales people often use material given to them by people they know and trust. Consequently, small informal groups of people with similar information needs are formed and they share information among them.

Finally, both acceleration team and sales people agree that if sales people are to add data about their cases to the Wiki themselves, they need very good guides and templates, making the process easy.

4.2.1.3 Governance

The largest issue in governance of the Wiki solution is who should be responsible for gathering and publishing new cases. Since the cases are published in a Wiki, anyone is allowed to enter new cases, but just being enabled is not sufficient. Someone needs to be responsible for having cases written on all new SOA projects and having them published in the Wiki. There are two possibilities for this identified by the respondents.

The first possibility is that the acceleration team interviews the opportunity owner of a case, writes the case and publishes it on the Wiki. There are multiple advantages with this approach. First, the acceleration team has more motivation to publish cases and consequently more cases will be documented. The acceleration team's members also have a better understanding of SOA and are therefore better equipped to write better cases. They would also be able to write cases with more even quality since they would develop their case writing skills over time. Some of the sales people specifically support the possibility of the acceleration team assuming responsibility for writing new cases.

The second possibility is to hold the opportunity owner responsible for writing the case and submit it to the acceleration team. According to the leader of the acceleration team, the opportunity owners are obliged to do this during a project. The sales people have the view that if they were to write these cases, they would not hold the right quality and would be too unreliable. Also, the sales people have trouble prioritizing writing cases over selling, meaning they cannot spend much time on it. That could lead to fewer cases actually being written and lower quality of the material.

Besides adding new cases, another important governance task is the maintenance of the Wiki. Since anyone can add to or change the material in the Wiki, someone must actively maintain it. This means to look through changes and new material and make sure that it is fit to be published. If cases contain major errors or omissions they need to be recognized and corrected as soon as possible. Also, in order to be credible within the organization, the acceleration team needs to be familiar with the content of the Wiki. If someone asks about a case, at least one person within the acceleration team needs to be able to answer. If the acceleration team does not maintain the Wiki, it could lose credibility if someone finds a case in the Wiki and the acceleration team does not know any of the details about it.

The acceleration team is uncertain on how to manage the maintenance of the Wiki. The leader thinks it would be hard to find someone willing to do the work, since it will probably be quite simple and monotonous. This person would still have to be at least somewhat

knowledgeable on SOA, making that person even harder to find. Another member of the acceleration team suggest that a junior consultant working for the team could take on this task, using around a day a week to maintain the Wiki. They both agree that it will be difficult to fund the activity, even though they recognize the necessity of it.

4.2.1.4 Motivation

How people should be motivated to contribute to the Wiki and use the information from it is an important question. Both the acceleration team and the sales people seems to agree that as long as the Wiki provides useful information, the sales people will want to use it. The issue is rather about the contribution to the Wiki. How difficult and time-consuming it will be to contribute is largely dependent on the governance model selected (whether the acceleration team or the opportunity owner should write and publish the case), but at least the opportunity owners needs to be involved in the collection of case information.

The respondents do not agree on how people should be motivated to contribute to the Wiki, though there seems to be a general agreement on that the motivation should be economical or at least be connected to the PBC. The L&K expert thinks that the PBC should be enough to motivate people, whereas some of the sales people think that the PBC is not well suited for activities that are not easily quantified, such as knowledge work. One of the sales people suggests that a simple monetary reward for each documented case could be used.

Contrasting opinions exists within the acceleration team on whether making contributing obligatory is a good idea. One respondent believes it is necessary in order to get contributions and another believes that the sales people would not care whether it is obligatory or not. There also seems to be some confusion on whether writing cases on a completed project is actually obligatory today – it seems clear however that opportunity owners would not voluntarily write case descriptions for the acceleration team today.

A few non-economical motivations have surfaced during the interviews. One sales person says that external motivation is not necessary – he claims that he would write his cases in order to promote himself and his customers. It is not certain whether this is the case with the other sale people too. Both one of the sales people and the L&K expert are certain that people really want to contribute and that time and prioritization is the problem when they do not. Finally, both people from the acceleration team and sales people claims that people typically helps when asked, though more often if asked via telephone rather than email.

4.2.2 Ranking of information properties

During the interviews, each respondent were allowed to rank six properties of information presented in (Davenport, 1996). The idea was to find out if there are any major discrepancies between the different roles, for example between the sales people and the acceleration team, with regards to what makes information valuable. The rankings have been summarized in Table 9.

Property	Respondent							Mean
	S1	S2	S3	S4	AT1	AT2	LK	
Accuracy	6	2	4	5	5	4	4	4,29
Timeliness	5	5	3	6	4	5	2	4,29
Accessibility	1	4	2	4	3	1	1	2,29
Engagement	2	3	5	2	2	2	5	3
Applicability	3	1	1	1	1	3	6	2,29
Rarity	4	6	6	3	6	6	3	4,86

Table 9: Respondents' ranking. Ranking 1 means most important, 6 means least important.

How the respondents perceived the different factors have probably affected the results. For example, should accuracy be perceived as exactness ("The contract was for 1.4782 MSUD") or correctness? During the interviews, we explained the different factors to the respondent, which could also be a source of bias on their meaning. Finally, since the set of respondents are so small, the statistical relevance is low. Still, we believe that these answers give a general idea of the information property prioritization of the respondents. This survey is combined with the qualitative analysis to arrive at more reliable conclusions.

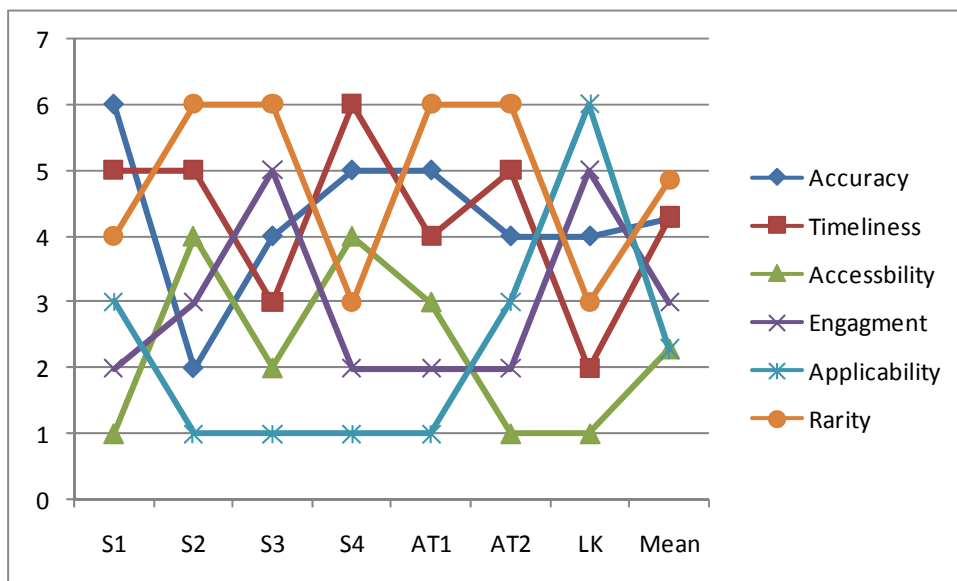


Figure 12: Ranking of properties.

In the chart in Figure 12 the rankings of the different people have been plotted. The three properties with the lowest ranking (i.e. most important) are accessibility, engagement and applicability. Looking at the mean values from Table 9, it is evident that these three properties are the most important one. These properties stay in the lower part of the graph for most of the respondents, though there are a few exceptions. The ranked importance of the properties varies greatly among the respondent, within as well as between groups (sales people, acceleration team, L&K expert). Therefore, the only conclusion that can be drawn is that accessibility, engagement and applicability is more highly valued than accuracy, timeliness and rarity.

5 Analysis

In this chapter each area of requirements (Content, Enablement, Governance, and Motivation) is analyzed. After that, it is discussed how the different areas affect each other. Finally, some points are made regarding the prioritizations needed by the acceleration team.

5.1 Content

Note that “content” refers to the processes relating to what kind of information the Wiki should handle, what it should be used for and which attributes it should have. Making sure that the information is of high enough quality is the responsibility of the processes relating to governance.

The result of our survey shows that there is no consensus regarding which attributes of the information the employees regard as the most valuable. However, it can be deduced that applicability, engagement and accessibility are more highly valued than timeliness, rarity and accuracy. This means it is those three attributes are most important in order to make the sales people at IBM more interested in using the Wiki. The L&K expert’s opinion differs from those of the acceleration team and the sales people. We believe that this is because the L&K expert understood the attributes differently, since she is likely to have developed different values because of her work with learning and knowledge. We do not believe that the difference in results represent a genuine difference in opinions, but rather that the L&K expert gave the terms (applicability, accuracy, rarity, etc.) a different meaning when ranking them.

To make information more applicable it is important to provide a rich context. The most basic context to provide for the customer cases is metadata regarding the company and which industry it is active within. This will make it easier for the sales people within IBM to decide whether the case might be of interest for the project which they are selling. If information regarding why the project was initiated is given, i.e. if the specific problems the customer wanted to solve are described in detail, this will become even easier. The more detailed the given context is, the easier it will become to find aspects of the case that is applicable for new projects. This can be important since many companies have very similar processes, e.g. processes for procurement, regardless of what industry they are active in. Finally, if the information is not very detailed it will be more applicable in a wider area. Very detailed information may be very applicable within its context, but the value of the information lessens the further you move away from the specific context.

The sales people also want the information to be engaging. All of the sales people we interviewed said that the information in the Wiki should be kept general and mentioned that large PowerPoint presentations actually would be deterring. If they would need to spend a lot of time looking through the information presented on the Wiki in order to find any useful material they would be less inclined to access it. In fact, if the amount of information was too great, they would assume that no useful material could be found and simply stop using the Wiki since it would be faster to create the material themselves or look for it in their personal networks.

One theory is that by mapping the KMS to the users' processes they would be more interested in accessing the system (Collison & Parcell, 2005). We believe that this is true for IBM as well since that should increase two of the most valued attributes. If the Wiki has a structure that is similar to the sales process it would show the sales people that the AT has an understanding of their work and therefore their information needs. First, it would improve applicability since it would provide a better context for where and when the information is meant to be used by the sales people. Second, the accessibility would be increased if the sales people could use their own process as a reference when looking for information.

One definition of information is that it can be understood as a message between a sender and a receiver (Davenport & Prusak, 1998). For the receiver to make any sense of the message there needs to be an understanding of what the message should convey for it in order to be applicable for the receiver. In other words, the sender and receiver should share an understanding of what the purpose of the message is. In order to make the information applicable it should be clearly stated who the receiver is and what the information transferred should be used for. This can be a problem if the sender and receiver belong to different specialist groups (Christensen, 2007). In a large organization like IBM this can be a major problem. The information need of the employees vary greatly between the different areas within IBM. For example, for a specific reference case the consultants will probably be interested in the actual effects on the organization, the software specialists might be interested in the architecture of the solution and the hardware specialists might need information regarding the hardware choices and encountered problems.

If the sender of the information is a system a predefined purpose of the information is even more important. If the sender is a person, she possesses more information and knowledge than that which is given in the first message. This makes it possible for the receiver to ask questions and ask the sender to clarify if there are some aspects she does not understand. If

the sender is a system the information that can be transferred is predetermined and it is possible that the information the receiver is interested in is simply not available. To reduce this problem it is important to have a clear understanding of the information needs of the primary users of the system and make sure that the information entered into the system corresponds well with those needs.

Since the selling of new projects is a very complex process it requires that the sales people possess tacit knowledge. One cannot simply follow a checklist for selling that can be applied for every new project. Each customer is different and will respond to different selling techniques. The fact that tacit knowledge is important during selling means that the use of a system is limited. Since the richness of a repository is low it does not support the socialization necessary to transfer tacit knowledge. This means that the purpose of the information in the Wiki at IBM should not be to provide a complete and detailed understanding of all aspects of the case project. Instead the material presented should only be detailed enough to give the reader enough information to be able to decide whether the key persons involved in the project may have knowledge that can be useful for the selling of the project. If the project seems to be interesting enough the reader should then contact the key persons in order to get more detailed knowledge regarding the project. We also believe that the ability to find people who have worked on similar projects or who possesses relevant knowledge is valuable to both experienced and inexperienced sales people. This gives the Wiki the potential of becoming a meeting place for sales people on all experience levels.

Finally it is important to know that this analysis is based on a study done during the summer of 2007. The information needs of the sales people will probably change in the future. In order to keep the Wiki useful it is important to regularly align the contents of the system with the information needs of the sales people.

5.2 Enablement

By enablement, we mean the processes which let users access and use the system as intended. This includes training, support and availability of the system.

At IBM there are databases for a lot of things and, for some things, there are a lot of databases. One of those things is customer reference cases. Customer reference cases can be found in a lot of places – in Knowledge View, on the intranet, in some specific reference case databases and also in the Wikis and homepages of a number of organizational units and communities. When sales people use the available databases, they typically use databases they are familiar with and have successfully used before, or they use aggregating search

engines such as the one on the intranet. Since similar information exists on different places within the intranet it is important that the aggregated search engines finds and present the information regardless of where it is located.

The sales people in the study ranked the information properties “Accessibility” and “Applicability” among the most important. This corresponds very well with their descriptions of using the internal databases. The problem is not that the needed information is not available; the problem is knowing where it can be found. Christiansen (2007) refers to this problem as “No knowledge of knowledge” – not knowing who has the needed information or where it can be found in a codified form. We believe that two goals have to be achieved in order for the sales people to use and gain value from the Wiki. First, the existence of the Wiki and its content must be communicated in a convincing way to the sales people. Secondly, the Wiki must be tightly integrated with the aggregating search engines so that its contents can be found easily without having to access the Wiki directly.

There is a number of conceivable ways of communicating the Wiki’s existence to the sales people. One way mentioned on several occasions by the acceleration team would be to get a link to the Wiki on the intranet’s start page. The disadvantage of that approach is that the link would be displayed to a number of people who did not specifically need it (administration, technicians, etc). It would also make the list of links on the start page longer, making it even harder to find the needed resource there. A more interesting choice would be an internal selling campaign. This campaign would primarily need to target sales people (including consultants) but not technicians or administrators, since it is unlikely that they would find the information in the Wiki useful. The sales people should be reached with a combination of email information and direct selling – basically, people from the acceleration team should spend a few days personally speaking to the key sales people, explaining to them the purpose of the Wiki and selling them the concept of helping maintaining it. This also have the positive side effect of strengthening the acceleration team’s position and giving them the opportunity to get in contact with sales people working on sales that could become SOA projects in the near future.

When the campaign is initiated, it is important that there is a large enough quantity of information in the Wiki and that the information maintains good quality. Sales people contacted in the selling campaign will likely visit the Wiki and quickly assess whether it seems useful or not. If they are to come back, they need to perceive the information as interesting and potentially useful. Consequently, it is important that there are a number of

good cases from a wide range of sectors and solution types in the Wiki from the start, so that the visitors do not leave feeling that the Wiki contains nothing for them.

The campaign's purpose should be to have sales people accessing the Wiki directly, but those who only use aggregating search engines should be able to access the information as well. This has several implications. First, the Wiki needs to be integrated with the most commonly used search engines, primarily the intranet's search engine. For the Wiki to be usable to the sales people using mainly the search engines, having such an integration is essential. For a search engine to work well, it should take into account keywords and tags made in the Wiki. Keywords and tags could help when trying to find material and could also connect material to the sales people's own processes. A document tagged as "Insurance/Quotation" could help a sales person when writing a quotation on an insurance case, but would not be useful in an early sales phase. This way, information is connected directly into the sales people's own process and thereby becoming more valuable to them. It is not reasonable to expect all sales people to learn to use the Wiki directly. Some of them have standard routines for searching for information, and it does not seem likely that they will make major changes in how they work to accommodate for a new Wiki. For these sales people it would be best to offer the data from the Wiki directly in the intranet's search engine. This way, they get access to new information without having to concern themselves with the Wiki.

An important factor for introducing a new knowledge management system in an organization is having a common technical infrastructure. This includes all potential users having access to computers, networks and most importantly, the right knowledge to use the system. At IBM, this is a smaller problem than at most companies, but one that still should not be ignored. Nearly everyone working at IBM has their own computer and a standardized set of software. They also have access to a range of systems via the intranet. One of these systems is the Wiki Central, a platform for managing and using Wikis. Everyone having access to Wiki Central does not imply that everyone at IBM uses it or knows how to use it, but it does however mean that there is a higher awareness on what Wikis are and how they can be used. It is not realistic to expect the sales people to look up specific information on how to use Wikis when they need it. Instead, it is important to provide help and written guides to the sales people as needed. According to Egbu (2004), education is a critical success factor for any knowledge management system, since such a system can only be considered successful if it is used and users can only use it if they know how to use it. We believe that the selling campaign should include educational information *on the purpose of the Wiki*, informing the potential users of how the system could be of help and value to them.

Considering the “No knowledge of knowledge” problem discussed earlier, this is probably the most important educational task in introducing the Wiki. Practical help, such as guides, policies and frequently asked questions should be available in the Wiki, preferably in the context in which they are to be used. Guides on how to write cases should also be made available for download, so that a user does not have to have an internet connection in order to work on her case.

Using a Wiki, it is significantly easier to view information than it is to add or change information. This means that most likely only a sub-set of the people viewing information in the Wiki will also add or change information in it. What information is added to the Wiki and how this is done has a great potential effect on the Wiki – especially on the applicability and accessibility properties of the information. According to Christiansen (2007), there needs to be a relation and a common identity between the sender and the receiver of the information, which in this case translates to a need for the person adding or changing information to have an idea of who the final user is. This is also an important goal of the education about the system’s purpose mentioned earlier.

In addition, we believe that it is important to create the perception of a community within the Wiki. This could be done by achieving discussions in the comments of different cases, having people posting ideas and comments on the start page of the Wiki or by posting success stories about people successfully using information from the Wiki in new sales. We believe that if the perception of a community can be achieved, a better understanding between the senders and the receivers of information in the Wiki can be created. This could result in higher quality of the submitted information and more applicable contents.

5.3 Governance

With governance we mean the processes relating to deciding who should be responsible for adding new cases as well as validating and maintaining the information presented in the Wiki. One purpose of the processes relating to governance is to increase the trust the users can put in the information presented in the Wiki. The biggest question relating to governance is whether it is the AT or the users of the Wiki who should be responsible for making sure new cases are added to it.

Today the AT is active in IBM’s day-to-day operations by holding expert roles in some of the more SOA-heavy customer projects. If they were to be given the complete responsibility for adding new reference cases as well as maintaining the information on the Wiki their workload would be increased significantly. This would mean that their involvement in the day-to-day operations would decrease, which in turn would make them more isolated from

the main organization. This would make them less of active knowledge managers and instead make them take the role of more passive librarians. This isolation would decrease the AT's understanding of the information needs of the sales people which would diminish the value of the material presented on the Wiki. It would also be more difficult for them to identify new and interesting cases the more isolated they become. The biggest problem, however, would be monetary. If the AT would solely be responsible for the Wiki they would need a considerable budget to support their work. Since work relating to KM is very intangible there would be little or no measurable effects of their work on the organization. With a result oriented culture such as the one at IBM an initiative which appears to drain money without producing any tangible results would not last long.

The L&K department within IBM Nordic uses a similar approach with experts who manage a repository. They have two full time employees who harvest information from interesting projects and enter this information into Knowledge View. They believe this approach works quite well but think that the resources are too limited and would like to have more than two persons harvesting information. The fact that the AT uses a Wiki and not a closed system like Knowledge View makes it possible to involve the users in the information gathering process which should hopefully relieve the amount of work the AT need to spend gathering information.

Giving the users of the Wiki complete responsibility for adding new cases would not be a very good idea either. Since IBM can be classified as a professional bureaucracy the employees decides to a quite large extent what they should do. Since the KM work that needs to be performed in order to keep the Wiki valuable is quite time consuming and not very stimulating it would require powerful incentives for it to be done. The fact that the sales people are not evaluated on this kind of work today means it would require either a change in the culture or in the motivational systems, both of which are very difficult to achieve. Even if the sales people would write case descriptions for their won cases the quality would probably be too uneven without any coordination since the sales people cover a wide difference of areas and industries, each with slightly different information needs. This would make it more difficult to find useful information in the Wiki and decrease the credibility of the material found. Finally it is not really economically viable to let the sales people handle the Wiki. Their time is simply too valuable to spend on much else besides selling new projects.

Neither of the alternatives where one group takes complete responsibility for the Wiki is feasible. Instead an approach where they share the responsibilities, called governance lite, is

more realistic (Adelman & O’Niel, 2007). The basic principle of governance lite is that the sales people are authorized to do any changes to the existing material as well as add new cases. Their contribution would then be tagged as “user contributed”. This would alert the users of the Wiki that the material is not approved by an expert and may contain errors or be incomplete. The AT would then be responsible for validating the material and the changes made by the sales people, thus increasing its credibility. However, just because the sales people are allowed to add new cases do not mean that they actually will do it. The problems described above will still be present. In addition to verifying the changed material the AT would also have to act as a catalyst and facilitator for adding new case descriptions to the Wiki. The AT would be responsible for making sure case descriptions were written for any interesting cases. Since the AT would be involved in the day-to-day operations of IBM it will be easier for them to hear about and identify interesting new projects. For the sales people this approach means that they can focus on the work with sales the majority of their time. When they are contacted by the AT they can take the little time needed to help write a case description. Some sales people with a special interest in SOA will probably write case descriptions themselves and actively work on the Wiki without being contacted by the AT.

The important aspects of governance lite is to have the AT make sure that new case descriptions are added while not hindering the sales people from changing or adding information to the Wiki if they want to.

For adding new case descriptions, the governance lite approach would mean that when the AT finds an interesting project, they can contact the opportunity owner and ask her to write a case description, interview her to get enough information and write the case description themselves or write it together with the opportunity owner. The sales people can also initiate the process, either by simply writing their own case description and adding it to the Wiki and let the AT validate it, or they can contact the AT themselves and let them know they are the owner of a case that might be of interest. The fact that AT would be active in the day-to-day operations means that they would have a better understanding of the information needs of the sales people and thus have a greater credibility within the organization. It also means that they would have a better understanding and knowledge regarding which SOA project that are active at the moment and would have better knowledge regarding who new opportunity owners can talk to in order to find useful information. The AT can also identify competent and active users of the Wiki and give them special authority as super users to validate any newly added information.

For the validation and maintenance of the information on the Wiki the governance lite approach means that the AT and any super users should go through the material on the Wiki on a regular basis and see what changes and comments that have been made and take appropriate action e.g. approve or delete the changes. It is also important to make sure that the case descriptions are updated and remove any outdated cases if needed.

The biggest problem when it comes to the governance of the Wiki is that it is incredibly difficult to measure the effects of the work that is put in. Since it is difficult to measure the value of the Wiki, any KM activities relating to it will be regarded as costs. Since the acceleration team's consultants are fully billing consultants, it would be quite expensive if they were to be used for governance. So, who else could be used and what competencies would be required? First of all, it is important to understand that the work of governing the Wiki is not necessarily easy. According to Suchman (1995), the complexities of the work that are conducted by others are often overseen, and we believe that this is the case with governing the Wiki. The person or people governing the Wiki must both understand the varying sales processes of the sales people and know enough about SOA to be able to publish information and review the information published. The person or people governing the Wiki must also be credible within the organization; otherwise there is a risk that the potential users will not accept their authority and subsequently stop contributing material to the Wiki. Also, the person or people governing the Wiki must be in close contact with the acceleration team since it will be assumed that the members of the acceleration team will have knowledge and understanding of all cases presented in the Wiki. If the acceleration team is contacted regarding some details of a case and cannot immediately give an answer their credibility will decrease.

The first option for governing the Wiki is that it could be outsourced to an IBM Global Delivery Centre, for example one located in India, in order to minimize costs. The downside with this approach is that we believe it would affect the quality of the contents negatively. If the Wiki is managed from a remote location they would not have the same incentives to keep the quality of the material good since they would have little or no contact with the people who use the material in their daily work. If the Wiki is managed by people in the acceleration team they would be more motivated to keep the quality of the content high since they frequently have contact with the people accessing the Wiki and since they are the owners of the Wiki. The users would also find the material as more credible since it has been validated by someone they know. It would also be possible to have all the members within the AT spend very little time, maybe half an hour every week, to manage the contents of the Wiki. This would mean that all the AT members would be somewhat familiar with the

contents of the Wiki and should be able to help colleagues who have any Wiki related questions. However many AT members are already overworked today and additional responsibilities would not be welcomed. Another solution would be to employ a junior consultant in the AT and let her work part time with managing the Wiki. This solution would keep the cost lower than having an AT member do it and still keep the quality high. A problem with this is that when the junior consultant's workload on other projects increases, the work with the Wiki is likely to be given lower priority.

We believe that the acceleration team should keep the governance of the Wiki within the team, even though it will be costly. Discussing new cases and talking to opportunity owners of newly sold projects will help them stay connected to the development of SOA at IBM; it will also be a great way of influencing and educating the sales people. Governing the Wiki, the acceleration team will also know exactly what information is published, which we believe is necessary for remaining credible when a sales person calls to discuss a published case. The problem with this approach is that the cost is quite high, since the time members of the acceleration team use for governance otherwise could be used on customer projects. However, we believe that this is the best alternative, although it is not perfect.

5.4 Motivation

IBM is a typical example of Mintzberg's professional organization. The employees work primarily with their minds, using knowledge as one of their main resources. Direct control is not a feasible option in these kinds of organizations, for good reason. If an employee in such an organization is ordered by her manager to do A, she might still be certain that doing B is the better option. In such case, actually doing B is probably the better course of action, since ultimately the employee is likely to have a better understanding of A and B than the manager. Steve Jobs of Apple corp. once stated this as: *"It doesn't make sense to hire smart people and tell them what to do. We hired smart people and let them tell us what to do"* (Feldstein). Consequently, it is necessary to create personal incentives that aligned with the organizations goal – what is sometimes referred to as "goal congruence" - and let the employees create value for the organization by reacting to their own incentives, doing what is good for the organization and themselves simultaneously.

There are two activities carried out by IBM employees that may need to be motivated: reading material from the Wiki and contributing information to the Wiki. We believe that no motivation is needed for the sales people to read material from the Wiki, as long as it can provide them with the information they need without much effort. By providing accessible and applicable information, the Wiki decreases the total time the sales people needs to spend searching for information, making them return to the Wiki when other information

needs arises in the future. In order for people to contribute to the Wiki, we do believe motivation is necessary. In a professional organization, most people have more things to do than time to do them. This means that people prioritize and the tasks with lowest priority do not get done, important or not.

According to Levitt (2006), the three basic types of incentives are economic, social and moral. We believe that the economic incentives that are the most frequently talked about in the management control system discussion could be complemented with both moral and social incentives. Below follows a discussion on a number of different, perhaps complementing, incentives that could be used to motivate sales people to contribute to the Wiki.

Most economic incentives at IBM are centered on the PBC (described in “4.1.2 Personal business commitment”). How well each employee fulfills her PBC affects her salary, promotions and bonuses. Thereby, each employee has an economic incentive to fulfill her PBC. So why not include contributing to the Wiki in the relevant sales people’s PBCs? First of all, it would be very hard to include contributing to the Wiki in the PBC, because it is difficult to measure and quantify a Wiki contribution. The Wiki contributions need two properties – quality and quantity. The contributions need to be of good quality, and if they are, they need to be as many as possible. It would be very difficult to create a PBC that could take both these aspects into account in a fair and just way.

Also, for an economic incentive to work, it must be large enough to replace all non-economic incentives that might already be in effect. For example, if a \$1 cash reward was offered to everyone contributing to the Wiki, one possible outcome is that people would stop contributing, thinking that a single USD was an insufficient reward for their work. By offering a single USD in exchange for contributions, the non-economic incentives such as work ethics or social pressure would be replaced by a strictly economic one, which may not be powerful enough to motivate contribution. This means that for an economic incentive to be effective, it needs to be more powerful than the sum of all non-economic incentives. This can potentially make economic incentives expensive and, since it is hard to value information, make it very difficult to know whether collecting the information or not is actually a good business proposition.

An approach to knowledge management motivation is making it obligatory. One of the respondents from the acceleration team is quite certain that this is the best way of ensuring contributions. Another respondent believes that making contributions obligatory would not

help and that the sales people would not contribute more because it was mandatory. So, what would happen if contributions were to be made obligatory?

First, making contributions obligatory would not be a very strong economic incentive. Since obligatory contributions would make contributing the norm, the only possible economic incentives would be economic punishment for failing to contribute. We believe that this would be a far too mechanistic approach to be used in a professional organization and that the employees would not accept paying fines for failing to contribute case descriptions. The moral incentives are probably also weak, since the sales people could not be expected to develop the moral conviction to contribute case descriptions on their own in the near future. Even if this is possible, for example by engineering a culture to support it, it would take a long time and be very expensive. We believe that only social incentives could be expected to have an effect if making contributions obligatory, but this would also require that someone noticed whenever a sales person failed to contribute case descriptions. This could be achieved through a control system, where someone actively monitors sales people and exerts social pressure on those who do not contribute to the Wiki. Ideally, people could monitor each other and exert social pressure as needed, although this would require strong cultural support.

One of the sales people claims that he would voluntarily contribute information to the Wiki in order to promote his customers and his work. This could be a typical manifestation of moral incentives – actually wanting to contribute. It could also be a manifestation of an economic incentive, meaning the sales person is reacting to his PBC goal to share his information. It can often be hard to tell a moral incentive from an economic incentive, and since moral incentives are genuinely hard to engineer, we do not consider them a realistic option.

Using proactive knowledge managers to motivate sales people to contribute is another incarnation of social incentives. With this model, people working with the acceleration team interview the opportunity owners about their projects and writes the texts about them. Since the opportunity owners are asked to help by a colleague, they will feel the social pressure to help. They have no obligation to help the knowledge manager, but in most cases they will because of this social incentive. One disadvantage is that it is time consuming for the members of the acceleration team who have to spend time on every project that could be of interest; on the other hand it is probably the only way to investigate all interesting projects. This type of social motivation is also well aligned with IBM's current culture. During the study at IBM, we learned that people typically responded very well to social pressure,

which also leads us to believe that this model would suit IBM. At one point, we sent emails to 15 respondents, asking them to book phone interviews with us. A total of 2 persons answered. When we called the remaining 13 respondents, we were able to book interviews within a week for most of them. This is social incentives in action – the respondents find it very hard to “say no” to another employee, since they are a part of a culture that promotes helping and sharing. E-mails are easier to ignore since they are far less personal, especially e-mails with multiple recipients.

An advantage of this model is also that it allows for a more easily manageable management control system. With this model, the sales people are not rewarded (through the PBC) for contributing to the Wiki – instead only the acceleration team is. Since the acceleration team should spend a reasonable part of their time working with Wiki contributions, it makes more sense to evaluate them on the amount of Wiki contributions. This gives them an incentive to exert social pressure on the opportunity owners to help contribute to the Wiki. One important disadvantage that must be considered is that social pressure can only be used to a certain point. If too many activities are motivated by social pressure, the employees’ attitude towards helping will change and social incentives will no longer be a viable alternative. For example, if an employee is called up and asked to help with something too often, she will finally refuse.

5.5 The four different areas are interrelated

The enablement and governance of the Wiki affect each other. If the users of the system are highly enabled (i.e. they find the system easy to use) it is likely that more of them will use it. This will lead to an increase on the demands on the governance. If many users contribute to the system it will need stricter governance in order to keep the materials congruent with the purpose of the system. However, it is important to remember that there can be incredible value in having a wide user base, as it enables the sharing of knowledge and expertise across divisional and industry borders. If the enablement is low, the need for governance will diminish as well since fewer users will add new information to the Wiki making its contents easier to manage.

The governance of the Wiki is very central since it will affect the motivation of the users and the contents of the system as well. Strict governance helps ensure good quality of the contents of the Wiki, i.e. the contents of the Wiki will more likely be aligned with the purpose of the Wiki. However, too strict governance can be deterring for the potential users since if the process of getting new information approved is complex and time consuming they will be less inclined to contribute with new material. Less governance will keep the users more motivated since it will require a smaller effort to contribute. This however, will

make the contents of the system less valuable since it is more likely that some of the users have misunderstood the purpose of the system and added irrelevant material. This is a fine line to balance since either of the two extremes will be negative for the Wiki. If the governance is too strict the value of the Wiki will decrease as no new information will be added, if it is too loose the value will decrease since it will be difficult to find any useful material.

The contents of the Wiki will affect the users' motivation to read material from the Wiki as well as their will to contribute new material. If the purpose of the Wiki is well aligned with their information needs they will be more likely access the material presented on the Wiki. If a user has used information from the Wiki to help her in her work we believe she will be more willing to share similar information regarding her own projects in order to help other employees in theirs.

The users' enablement of the Wiki is directly linked to their willingness to use it. Simply put, if the Wiki is difficult to use their motivation to use it will decrease since it would be more efficient to search for the needed information elsewhere.

5.6 Prioritization for IBM

We do not believe that the importance of and priority between the four different areas of requirements can be generalized. Instead, they need to be analyzed within the context of each specific company and system. The importance of the different areas will also vary over time. For the Nordic SOA Wiki, we think that the following prioritization should be made.

Enablement should be managed first. IBM generally has problems communicating the existence of new systems; they can easily drown in the vast amount of information that already exists within the company. If the employees within IBM do not know that the system exists or how to access and use it, it will not matter what kind of information it can provide or how motivated the users are to share their experiences.

Governance is the second most important area since the form of governance will have great influence on the kind of incentives the users will need to use the system. The kind of governance is also an important factor for the users' level of confidence in the presented material. Motivation is highly dependent on the kind of governance that is in place for the system. Thus, the form of motivation needs to be aligned with the chosen kind governance in order to encourage the right kind of behavior. Since governance and motivation are interdependent, it is not possible to prioritize between them. Rather, they should be managed together. It is likely that motivation will be less important at the start though, since

the acceleration team will probably initiate most of the contributions in the early phases. Once the Wiki gains a wider user base, motivation becomes more important since it is needed to get the user base to contribute without interference from the acceleration team.

Content is, at the moment, the least important area. The purpose of the contents of the Wiki is well defined; it is known who the potential users are and what they should use the material for.

6 Conclusions

As stated previously the purpose of this thesis is to recommend processes which we believe are needed in order for the Wiki to generate value. In the previous chapter we have discussed the different areas of requirements that are linked to the AT's SOA Wiki. In this chapter this discussion is used as a basis for describing the processes we believe are needed in order for the sales people to gain value from the Wiki.

Each process is described on a general level. Our focus is on describing what should be done and the effects we hope it will have on the organization and the Wiki. We believe that in order to implement these processes a more detailed study is required in order to determine how the actual work of the processes should be carried out.

As discussed in the previous chapter we believe that some areas of requirements of the Wiki are more important to affect than others. In order to reflect this, the processes described below are listed in order of importance, from the most important to the least important.

6.1 Process: Internal selling

Since the Wiki only generates value when its content is used, it is important to get as many sales people as possible to access it. In order to do this, it is necessary to sell the Wiki internally, to the potential users. This selling should include letting the sales people know the purpose of the Wiki, since understanding why the information in the Wiki is valuable is key to using it. Selling the Wiki internally can be done in many ways – email information, telephone sales or an article in the monthly newsletter or at the intranet. Targeting is very important when selling the Wiki internally. A lot of people at IBM are not interested in the Wiki and have no use of it whatsoever. Therefore, the selling of it should be closely directed to the people who have a use for it. This way, the communication can also be more tailored to the relevant people. A new round of internal selling should be initiated regularly, perhaps twice a year, but also if usage of the Wiki is decreasing or assessed as too small. The usage of the Wiki, including key indicators such as viewings of cases, file downloads and contributed cases needs to be constantly monitored. Each round of internal selling should also be followed by a measuring of the effect of the communication, for example by analyzing the usage patterns of the Wiki. This process needs to be carried out by the acceleration team.

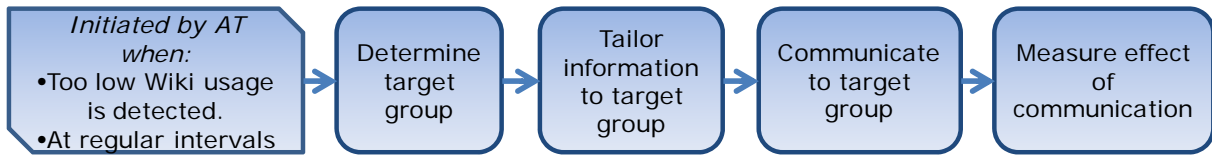


Figure 13: The process for selling the Wiki internally.

The aim of this process is to effectively communicate the existence of the Wiki to the sales people who might have use of it. It should also educate them about the purpose of the Wiki and how it is supposed to help them in their work. A targeted selling campaign will also exert social incentives on the persons contacted, making them more likely to access the Wiki compared to if they were to be sent an impersonal mass e-mail.

6.2 Process: Ensure search engine compatibility

All sales people cannot be expected to use the Wiki directly. Instead, some sales people use aggregating search engines such as the intranet's search engine instead. These people should also be able to access the information in the Wiki, as it would still be used to create value for the company. Because of this, compatibility between the Wiki and the most commonly used internal search engines must be assured. At regular intervals, the acceleration teams should verify that material from the Wiki can be found using the most common internal search engines. Since verifying this is just a matter of minutes, we recommend that it is done regularly.

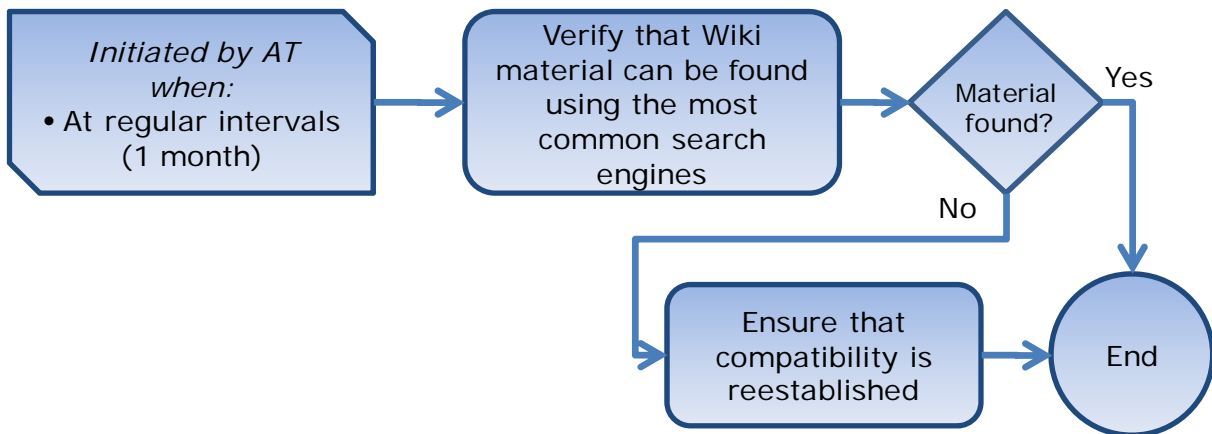


Figure 14: The process for ensuring search engine compatibility.

The existence of this process is important since it is needed to make sure that the contents of the Wiki are accessible without having to access the Wiki directly. This is important since some of the interviewed sales people seldom accesses individual sites in order to find the information they are looking for and instead uses the aggregated search engines that exist within IBM. If the Wiki is not connected to the search engines we believe that many potential users would not be able to make use of the material on the Wiki.

6.3 Process: Add new case information

The process of adding a new case can be initiated by people of two different roles: the acceleration team or a sales person. A sales person can initiate the process in three ways – either by contacting the acceleration team about publishing a case not yet written, by writing a case and sending it to the acceleration or by writing a case and publishing it on the Wiki. The acceleration team can only initiate it by contacting a sales person, asking for help to write a case. The reason the acceleration team should contact sales people working on interesting cases is that that all sales people do not have the proper motivation to write a case description and contribute it to the Wiki. By calling the sales person and asking for help, a social pressure is created, which often is enough to make the sales person help write the case. The sales people who have the proper motivation will write the case description and either send it to the acceleration team or, if capable, publish it themselves on the Wiki. It is likely that the acceleration team will initiate the process most frequently. If the case description is published on the Wiki by the acceleration team, it is first validated in the information validation process described below.

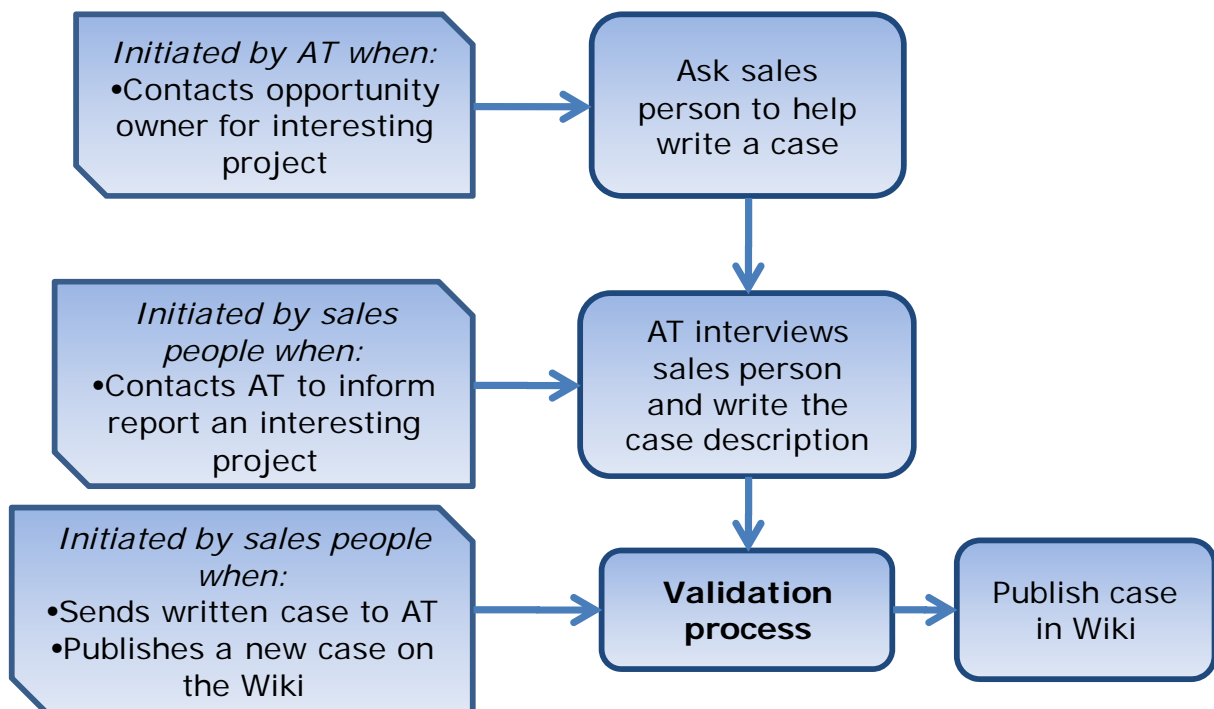


Figure 15: The process for adding a new case.

This process is needed to make sure that new material will be added to the Wiki and increase the structural capital within IBM. We hope that the sales people are willing to initiate this process frequently. However, we believe this is unlikely and that it will be the

responsibility of the acceleration team to make sure that interesting projects are identified and that case descriptions for them are written.

6.4 Process: Validate case information

It is important for the sales people that the information in the Wiki is at the right level of detail, contains the right information and is of the right quality. To ensure this, all material in the Wiki should be validated by the acceleration team, in accordance with the principles of Governance light. The validation consists of checking the material against the current information needs of the sales people, as dictated by “6.5 Process: Ensure information congruence”. The information need could be documented with for example check lists or templates. If the information is not congruent with the current information need, superfluous information can be removed or, if important information is missing, the sales person can be contacted for additional information.

The validation process can be initiated in several ways. Information can be submitted to the acceleration team for publishing by a sales person or the acceleration team interviews a sales person and writes the case description. The acceleration team must also look through the changes made in the Wiki at regular intervals to see what changes and additions has been made there and validate them. If they are accepted, their status is changed from “User contributed” to “Acceleration team approved”.

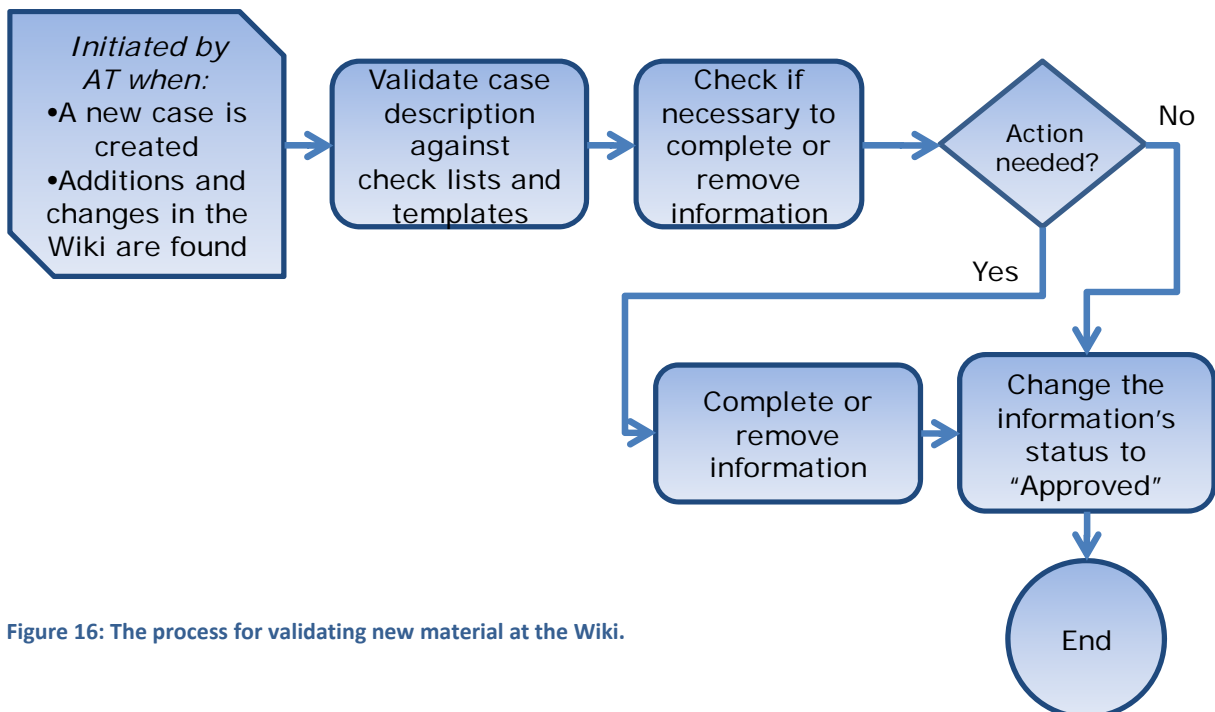


Figure 16: The process for validating new material at the Wiki.

This process is needed to make sure that the user provided information corresponds with the purpose of the Wiki. It can also be used to identify people who have taken extra interest

in the Wiki and consistently provide good and accurate information; these people can then be given special “super user” status and help the acceleration team with managing the Wiki.

6.5 Process: Ensure information congruence

Since it has become evident that providing the right content to the sales people is crucial, a process is needed to assure that the information managed in the Wiki is the right one. Unneeded information in knowledge management systems clearly have a negative effect on the users at IBM and should therefore be avoided. In this process, members from the acceleration team must examine the information needs of the sales people at regular intervals, for example by interviewing a number of sales people. If they discover that the information needs of the sales people have changed or that the information in the Wiki is misaligned with the information needs of the sales people, they need to take action. First, they need to make sure the new information needs propagates to the sales people, so that they can adjust what kind of information they enter into the system. This can be done by changing the templates used to enter new information in the Wiki and by making sure that the right changes are made to the Validation process checklist (see “6.4 Process: Validate case information”). Secondly, they need to realign the information in the Wiki to meet the new information needs. This might include removing existing information that is no longer needed and contacting the information’s author for complementary information to be added. We recommend this process is initiated every 6 months.

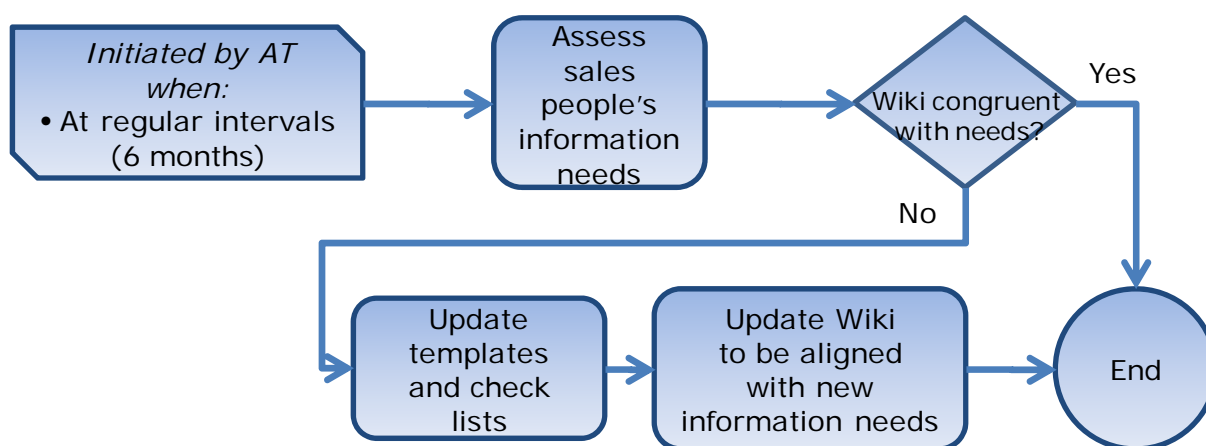


Figure 17: The process for keeping the material in the Wiki congruent with the user needs.

The purpose of this process is to make sure that the contents of the Wiki is aligned with the information needs of the sales people over time. It is important that the information needs are evaluated regularly to ensure that the information collected and published actually is of use for the sales people and that it is not done purely out of habit.

6.6 Summary of the impact of the processes

The purposes of the processes are described above. How the different processes impact the different areas of requirements is summarized in Table 10. We do not try to quantify how much each process affects each area of requirement since this should probably be done with a study when the processes have been used for some time.

Affected areas / Processes	Governance	Motivation	Enablement	Content
Internal selling		X	X	
Ensure search engine compatibility			X	
Add new case	X	X		
Validate information	X			X
Ensure information congruence				X

Table 10: Summary of the processes' impact.

6.7 Dynamic importance of the processes

Some of the processes are more important at the launch of the repository whereas others are more important in the longer perspective. Therefore, some of the processes should be given higher priority during the launch of the Wiki and other processes should be prioritized during the continued use of it.

The internal selling process is the most important process during the launch of the Wiki since its purpose is to gather a wide base of users to the Wiki. Once a user base is established, the Wiki will gain some gravity and start to attract new users by itself, simply by providing the right information. Consequently, the need for internal selling decreases.

The processes ensuring that the Wiki's content can be found using the internal search engines are important through the Wiki's whole existence since this process is in place to assure that the Wiki creates the maximum amount of value for the organization. The process for adding new cases is less important during the first few months since case descriptions of the ongoing projects are already written and it will take some time before new interesting projects have been won. Only when a user base has been established can people be expected to contribute to the Wiki and it is then that the process for adding new cases becomes important. The process for validating cases follows the process for adding new

cases in importance since the process for validating cases is mainly needed after the process for adding cases has been executed.

Finally, the process for ensuring information congruence is not very important at the launch of the Wiki since the information already in the Wiki is aligned with the sales people’s need at the launch. It will take some time before new information is added to the Wiki and also until the sales people information needs have changed. Therefore, the process for ensuring information congruence increases in importance with time. How the importance of the different processes change over time is summarized in “Table 11: The importance of the different processes over time.

Processes / Importance for..	..launching the Wiki	..continued survival of the Wiki
Internal selling	High	Medium
Ensure search compatibilities	High	High
Add new case	Medium	High
Validate case information	Medium	High
Ensure information congruence	Low	Medium

Table 11: The importance of the different processes over time.

We do not believe that it is likely that the Wiki will ever be completely self sufficient. Instead, we think that there will be a need for constant monitoring, supervision and internal selling of it. However, if a large enough user base can be achieved, we believe that some individuals may chose to work more proactively with the Wiki and thereby relieve the acceleration team of some work. We also believe that the need a for SOA sale Wiki will fade away with time as SOA becomes a more a integral part of all sold projects and reference cases will be handled through the normal channels. It is difficult to say anything about how long time this will take since it is dependent on the uptake of SOA in the industry, but the acceleration team’s goal of dissolving itself within two years at least gives an indication.

6.8 Concluding remarks

We believe it is essential that the acceleration team is able to successfully implement these processes in order for the Wiki to provide any lasting benefit for IBM. The vast amount of information that exists within IBM today makes it difficult for its employees to find the kind of information they need to help them in their work. The acceleration team will need to effectively communicate the existence of the Wiki and the purpose of its contents in order to enable the sales people to use it effectively. If the Wiki is to continue creating value, it is important that new case descriptions will be added to it in the future. To do this the responsibilities of the different roles within the organization needs to be made clear by establishing a governance structure. This structure needs to be aligned with the company’s

culture in order to provide the right kind of incentives in order to motivate the persons involved.

6.8.1 Generalizability

Since the study was performed at IBM, some the conclusions we have arrived at and some of the processes recommended are not applicable outside of IBM. The purpose of this section is to explain to the reader how generalizable we believe our results are.

We consider the knowledge management cycle to be very generalizable. It exists in many different forms in different literature, and though we have chosen our own words to describe the different stages, it is the same cycle.

The OPR model including the four different areas of requirements of the processes that connect repositories to people is a formalization of ideas presented in a wide range of books and articles. We believe that this model is generalizable for technical knowledge management repositories, such as databases and Wikis. It probably does not lend itself to more human oriented knowledge management initiatives such as expert groups or mentoring programs.

The discussion on how the different areas affect each other is probably generalizable, but that the prioritization between them is not. The prioritization is based on empiric facts from the interviews with the employees at IBM and we believe that the needed prioritization will differ from company to company; for example, if another company has perfectly structured information databases but their sales people do not care to use them, motivation would probably be the most important area.

Finally, when generalizing the findings in this report to other situations and companies, we do not believe that SOA is an important factor. This means that the results in this report probably are as valid for projects concerning other types of reference case repositories, not only SOA cases.

6.8.1.1 Generalizability for the specific processes

Internal selling is probably a very generalizable process since making the potential user base aware of a solution is always necessary. IBM's employees are experienced in using different databases, making formal training less of a problem. However, since there are an abundance of databases for different things at IBM, this process is probably more important there than in other companies.

The need to **ensure search capabilities** is dependent upon the existence of an aggregating internal search engine and users that prefers these to using repositories directly. Since that is not always the case, this process is less generalizable.

The processes for **adding new cases** as well as **validating cases** as described in this report assume that a governance lite approach is taken. If another approach is taken these processes would have to be designed differently.

Finally, the process for **ensuring information congruence** is probably also very generalizable since the information needs of organizations and its employees are very likely to change, no matter what industry they are active within. We believe that the main difference between companies will be how often this process needs to be carried out.

6.8.2 Validity

We believe that the validity of the results of the study is high. We believe that our general definition of KM, the KM cycle, presented in the chapter presenting the literature study is valid since it is derived from the synthesis of a number of different definitions. The definition of the four different areas of requirements relating to the processes connecting the organization to a repository should also be valid. We have two reasons for this belief; the importance of each area was supported by two or more different authors. Also when we applied the model on our empirical study we had no difficulty categorizing each KM related statement from the interviewees under one, and only one, of the four areas. This implies that the four areas cover the most common aspects of KM and does so without overlapping each other.

The discussion regarding how the four areas of requirements of the processes affect each other is the result with the least academic validity of the study. They are supported neither by theories in academic literature nor empirical facts observed at the company. However, much thought has been put into this result and, given the definitions of the areas of requirements, we believe them to be realistic.

6.8.3 Reliability

The KM cycle presented in the literature study should be reliable since it was developed from a number of literature sources. We believe that other authors might have given the creation of new knowledge a more prominent role in the cycle and given that a step of its own. We, however, believe that the creation of knowledge is not a discrete step of its own and rather that new knowledge is generated continuously during the other steps of the

cycle. Also the terminology we use (especially “collect”) implies a repository. Authors with a more human-centric point of view might have given that step a different name.

The OPR model and the four different areas of requirement are developed through the literature we found during our study. The articles we have read have had a great influence on this model and we believe it might have been different if we had come in contact with other/different literature. It is incredibly hard to say if other authors would have come up with the same links between the areas and how they affect each other.

The fact that we interviewed in total seven different employees at different departments within IBM should increase the reliability of the priority of the different areas of requirement and the recommended processes. Since we got opinions from employees with different positions, experience and job roles we believe we got an understanding of the information needs of the company as a whole instead of the needs of a single individual.

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Interview: Sales personnel

“Explain the purpose of the system.”

Contain information about successful projects.

How the work in the sales phase made IBM win the opportunity.

The effects of the actual project. Which aspects of the company was improved? How much money will be saved?

“How do sales work? Is there a typical sales process?”

Are there any specific tasks that recur often?

Are there any phases during sales that have different information needs?

“In order to use a system like this, what kind of information would you need to get from it?”

For example: Powerpoints, calculations, quotations, etc?

Can documents (files) be reused? Is there any value in being able to find previously used presentations for example?

Are there any information needs that come back in many sale processes?

What business needs do they need to solve using the information?

What would they use the information for?

“If the system existed today and you found it easy to use, would it actually help you in your work?”

Is there an actual need for a system like this or is your work too varied?

Is a database-system the best way to go? Could other ways work better – mentoring programs, weekly meetings, etc?

“What would make you consider a knowledge management system as not useful?”

Quality of the information?

Technical requirements? Response times etc?

Governance – editors that make demands etc?

“What would you require in order to add information to a system like this?”

Motivation? The information I get from the system is actually useful? Monetary rewards?

How much time/energy could you put into it?

Do you perceive that people are very willing to share their information? Have ever felt that someone is hoarding information?

“Are you using any kind of similar systems?”

Do similar system exist?

How many?

Do you use them? Why / why not?

Strengths / weaknesses with these systems?

“Do you have any other kinds of KM-related responsibilities?”

What kind of responsibilities? Evaluate / document completed sales?

Are you active within any kind of “community”?

Non-electronic KM-activities? Mentor programs?

“Please rate the different criteria from ‘1’ (unimportant / adds little value) to ‘10’ (very important / adds much value)”

Knowledge management guru Thomas A. Davenport has presented 6 different criteria which makes information valuable:

Accuracy; no errors occurred during the creation of the information, I can trust the source of the information.

Timeliness; the information is up-to-date and still relevant for my needs.

Accessibility; the information is easily accessible. It’s structured and easily interpreted.

Engagement; the information is noticeable.

Applicability; the information can be used directly to solve a business problem.

Rarity; the information is unique, requires privileged access.

<input type="checkbox"/> Accuracy
<input type="checkbox"/> Timeliness
<input type="checkbox"/> Accessibility
<input type="checkbox"/> Engagement
<input type="checkbox"/> Applicability
<input type="checkbox"/> Rarity

Interview: Acceleration team

“Please rate the different criteria from ‘1’ (unimportant / adds little value) to ‘10’ (very important / adds much value)”

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- Accuracy
- Timeliness
- Accessibility
- Engagement
- Applicability
- Rarity

“What is the purpose of the SOA Acceleration team here at IBM?”

What kind of work do they do?

How should their work help the other employees at IBM?

Rights and responsibilities? How much money/resources do you have?

“What does knowledge management mean to you?”

How does AT:s view of KM differ from that of the sales people?

Do their view of KM focus on the technical (databases) or people/organization?

Do they regard their work as KM?

“When creating KM systems like this, what is AT:s role?”

Create the system/processes?

Provide content?

Who is responsible for the parts AT doesn't manage?

“What will AT:s role be in the future?”

What should AT accomplish before being terminated?

“What is AT:s view on governance?”

Who is responsible for maintaining the database? Making sure that all the information in it still is relevant? Change the processes for adding information to the system, quality vs ease-of-use?

“How active do you think AT will have to be in their work?”

Passive “librarians” or active “knowledge managers”. Will the sales people actively seek out the information AT provides or will AT have to “push” the information to them?

“What kind of information do you think it's most important to provide the sales persons with?”

Information regarding key persons?
Customer presentations?
Actual results from the projects?

“How do you perceive employees willingness to share knowledge within IBM?”

Are people willing to share their knowledge? Willing but don't have enough time?

“What do you think will motivate people to use a KM systems like this?”

What kind of motivational factors? Monetary, reputation?

Has monetary rewards ever been used?

Is it enough to provide a good system?

Voluntary or compulsory.

Interview: Learning and knowledge expert

“Please rate the different criteria from ‘1’ (unimportant / adds little value) to ‘10’ (very important / adds much value)”

Knowledge management guru Thomas A. Davenport has presented 6 different criteria which makes information valuable:

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Accessibility; the information is easily accessible. It's structured and easily interpreted.

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Applicability; the information can be used directly to solve a business problem.

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<input type="checkbox"/> Accuracy
<input type="checkbox"/> Timeliness
<input type="checkbox"/> Accessibility
<input type="checkbox"/> Engagement
<input type="checkbox"/> Applicability
<input type="checkbox"/> Rarity

“What is your view on the general view of KM within IBM?”

Focus on technical systems / databases or increase contact between people?

Value from mixing types of systems, i.e. databases with mentor programs?

“What steps have IBM taken in order to manage the vast amount of information which flows through the company?”

Formal knowledge workers? A CKO? Other kind of knowledge managers and/or librarians?
How does it work today? How does IBM want it to work?

“How do you perceive employees willingness to share knowledge within IBM?”

Are people willing to share their knowledge? Willing but don't have enough time?

“Does IBM provide special motivation for increased knowledge management?”

Monetary rewards? Other kind of rewards?

“How does employee education work?”

Internal/external education?

Up to the individual employees or do IBM suggest relevant courses?

“How do you see IBM's knowledge workers?”

As knowledge managers, librarians – or everyone is a knowledge worker?

If everyone is – do some have special responsibilities? As librarians, knowledge managers or editors for example?