MEANING-MAKING KNOWLEDGE SHARING

LEARNING ASPECTS OF A SANDVIK KNOWLEDGE MANAGEMENT SYSTEM

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SWEDISH TITLE
Meningsskapande kunskapsdelning, Lärandeaspekter hos ett kunskapsdelningssystem på Sandvik.

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Dedicated to grandpa

ABSTRACT

The focus of this thesis is the knowledge management system (KMS) at a Sandvik design department. Purposed to deal with information overload using user-generated content, it is also intended to enable the employees to share knowledge. Previous research has studied what motivates employees to use technology for knowledge sharing. This study seeks beyond what is motivating and instead asks what it is that creates meaning for the employees in using and contributing to the KMS. Based on what is found to be meaning-making the thesis discusses and highlights design considerations for the KMS. Qualitative methods as well as theories on learning, motivation and meaning-making is used. Six employees were interviewed and the analysis suggests using thematization that what is meaning-making for the employee is linked with the approach towards work tasks. Meaning-making aspects is seen as either instrumental or social. The use of communicative and social features should be considered.

KEYWORDS: meaning-making, knowledge sharing, knowledge management system, qualitative research, learning, motivation

SAMMANFATTNING

I uppsatsens fokus står en kunskapsdelningsplattform på en av Sandviks konstruktionsavdelningar. Plattformen ska med användargenererat innehåll underlätta informationssökning samt tillåta användarna att dela kunskap. Tidigare forskning har studerat vad som motiverar anställda att använda datorsystem till att dela kunskap. Denna uppsats söker bortom vad som motiverar och frågar istället vad det är som skapar mening för de anställda i att använda sig av och bidra till denna plattform. Utifrån detta diskuterar och föreslår uppsatsen designförslag till plattformen. Kvalitativa metoder samt teorier om lärande, motivation och meningsskapande används. Sex anställda intervjuades och i den efterföljande analysen som bestod av tematisering framkom det att vad som skapar mening för den anställde går hand i hand med hur denne ser sina arbetsuppgifter. De meningsskapande aspekterna betraktas som antingen instrumentella eller sociala. Användning av kommunikativa och sociala funktioner föreslås till utformningen av plattformen.

NYCKEL-ORD: meningsskapande, kunskapsdelning, kunskapshanteringssystem, kvalitativ forskning, lärande, motivation

FOREWORD

Ever since I was little and first interacted with a Macintosh LC II in the early 1990s I have been interested in the topic of "what can I do to make everyday life a little bit easier". This interest led me down in two parallel paths – I became passionate about how one can teach others about technology in the best way possible, but also in how one can develop and design easy-to-use software that could make tasks of everyday life simpler.

This thesis marks the pinnacle of that journey. Not only is it the end of the *Master of Science and Education* program; but as it takes on theories on learning, motivation and meaning-making, so has it also transformed my own learning, motivation and meaning-making during the course of designing this thesis. It was all made possible thanks to:

Tanja – for pushing me to see the bigger picture,

Anders – for helping me noticing the small details, and

Mårten – for believing in me.

Thanks also goes to Sandvik the company for all the cake, post-it-notes, a desktop and the employees participating in the study. Tove and Alejandro for *bollplank* and feedback. Erik for being opponent and to those of you who were in my supervision groups at both KTH and SU.

Thank you Kersti and Jon for being there by my side.

Oscar Björkman

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ACRONYMS

CAD Computer-aided design

CMS Content Management System

ICT Information and Communications Technology

IMS Information Management System

KMS Knowledge Management System

1 INTRODUCTION AND BACKGROUND

This chapter gives a bigger picture and narrows it down to how this thesis came to be, through an introduction and background.

1.1 INTRODUCTION

As technology has evolved and media have become more digitized, the speed, volume and reach separates new media from the past (Lindenius, 2012). This has changed how information is accessed, communicative patterns (Kress & Selander, 2012) and the "transferability of knowledge across time and space" (Roberts, 2000, p. 429). In an organization, knowledge is a potential source of competitive advantage and knowledge sharing a critical factor to a company's success (Davenport and Prusak as cited in Agrawal, Muhammed, & Thatte, 2011; Cabrera & Cabrera, 2002; Oye, Salleh, & Noorminshah, 2011).

But information and communications technology (ICT) rarely alone suffices in facilitating knowledge sharing, instead researchers have searched for what it is that motivates the employees (Brazelton & Gorry, 2003; Hendriks, 1999; Lam & Lambermont-Ford, 2010; Vuori & Okkonen, 2012; Yu & Liu, 2008).

1.2 BACKGROUND

Sandvik is a Swedish company with advanced products and world-leading positions in machining solutions, materials technology and construction among other areas. The business includes research and development, production and sales of high-technology products (Sandvik AB, 2013).

At one department involved in tool development, main tasks include designing these tools using 3D modeling computer-aided design (CAD) software. Each of the five employees work individually with creating drawings for quotations and orders in an open plan office. At their help they have several information systems and databases to aid them in their work, but because of the amount of information and how it is spread out, information search procedures takes a lot of time. This was noted as an area of improvement by the manager of the department in 2011.

As a result, a project centered around knowledge- and information-management was initiated the same year to address this problem, among others. The suggested solution was to build a knowledge management system (KMS) using social software. As of this study, a pro-

totype of a web-based platform is being developed using WordPress[1] and beta tested within the department.

The purpose of this platform is to save in time by being the number one go-to source for information, ease the search process by filtering out non-relevant information and provide the employees a uniform way of sharing knowledge within the organization. It is intended to be a user generated knowledge sharing platform supplementing already existing resources, containing undocumented information needed for daily routines, processes and projects. Although developed using WordPress, it takes the shape of a content management system (CMS) rather than a blog or a wiki.

This study revolves around this department, from here on referred to as design department A, and this knowledge management system, from here on referred to simply as *the platform*. The study aims to discuss how the platform can be designed in order to create meaning for the employees.

1.3 ABOUT THE THESIS

This thesis is a degree project in technology and learning, the final part of the program *Master of Science in Engineering and of Education* (300 credits). The program is a collaboration between KTH Royal Institute of Technology and Stockholm University (SU).

It follows the course plan of UMK900[2], with main supervision given at SU and secondary supervision given at KTH. The thesis will therefore be more oriented towards learning than technology. The course is 30 credits, estimated 20 weeks work, where 15 credits must take place in a learning environment outside of SU and KTH, in this case at Sandvik.

1.4 THESIS OVERVIEW

Following this introducing chapter, chapter 2 sets up the foundation for this thesis, describing the purpose and how the research question was chosen. Chapter 3 details the theoretical basis, from previous research on knowledge sharing and knowledge management systems to theories about learning, motivation and meaning-making. The methods used to answer the research question are then addressed in chapter 4. Because of the qualitative approach, results and analysis are presented together in chapter 5. Results in this thesis refer to direct results followed by the methods used while the results of the analysis is summarized in chapter 6 as conclusions. Finally in chapter 7 the conclusions made will be discussed in a broader perspective along with criticism of the used methods.

1 Open source web software for blogs and websites, see http://wordpress.org/

2 See http://www.kth.se/student/kurser/kurs/UMK900?l=en

2 PURPOSE AND RESEARCH QUESTION

This chapter narrows down the problem leading up to this study, followed by the thesis' purpose and research question.

2.1 THE PROBLEM

Within Sandvik in general, and at department A in particular, information resources are frequent. Digital libraries, manuals, reference guides, tables and alike lessens the burden on the employees to memorize large amounts of data. However, all these libraries has spawned another problem, the one of *information overload* or rather *information filtering*. With larger and more scattered information resources, more time is required when searching for the right information. As the purpose of the platform is to solve this problem, another problem arises – what makes this platform not just another information system?

Unlike current information resources, which are maintained externally to department A, the content within the platform of this study is user-generated. Therefore the value of the platform will be dependent on the employees' participation. So when developing and evaluating this platform it is of significance finding out what makes the employees interact with the platform.

Possible factors affecting participation could be rewards given workers and/or if the interface is satisfying enough. Because the platform is currently a prototype being tested in one department there are no management forces in place. Participation is not externally rewarded and there is no punishment for not using it. Also, there are constraints to designing the interface and the user experience because the platform is a prototype built using WordPress rather than custom made from scratch.

The problem is then reduced to why the employees themselves would want to use a KMS, rather than to what the company can do, or how the interface can be designed, to make them use it. Previous research has searched for the answers within *motivators*, asking questions similar to "what motivates employees to share their knowledge through a knowledge management system" (e. g., Vuori & Okkonen, 2012). However, motivation can be difficult to define and the concept of motivators has some drawbacks (see section 3.2).

Another approach is widening the problem from motivation to instead look for what it is that creates meaning for the employees in interacting with the platform. Aspects of interaction with a KMS can be either *producing* or *consuming* information, however this thesis sees

the aspects of *using* and *contributing to* the platform. The former refers to when an employee browses the content while the latter refers to when adding, editing, commenting and deleting the content of the platform.

Approaching the problem from the employees' point-of-view gives at least two benefits: a platform not fulfilling its purpose can be explained using the employees relation to and perception of the platform, rather than only in the platform's implementation. Did they find the use of a platform meaningful enough? Also, if the employees do find the use of a KMS meaningful then the reasons for that can be used to further develop the platform and related strategies.

The bigger problem of understanding why some knowledge sharing systems ends up as "just another information system" has now been narrowed down to the specific problem of understanding what meaning the platform creates for the employees at department A.

2.2 PURPOSE OF THESIS

The purpose of this study is to highlight and discuss some aspects to consider when designing ICT for knowledge sharing, based on what meaning employees find in using and contributing to a knowledge management system.

The aim is that the aspects highlighted by this study will be useful when developing the platform and strategies for knowledge sharing at the department, and in similar companies, mainly because of the user perspective it provides.

2.3 THE SEARCH FOR A RESEARCH QUESTION

The bigger driving question which built a foundation for this thesis has been "What makes a KMS successful?" Even if successful is further defined as successful in engaging workers and affecting organizational performance, it is still an abstract question which doesn't take into consideration who the platform should be successful for. The question went through a lot of changes in narrowing it down and making it less abstract over the course of this thesis. The focus shifted mostly from the design of the prototype and motivation theories to the whole context of the prototype and the employees along with theories about meaning-making. This was done because of the platform being in early development, drawbacks found with first suggested theories and because of personal interest.

2.4 RESEARCH QUESTION

The research question this thesis aim to answer is:

- For the employees of a Sandvik design engineering department, what is it that creates meaning for them in...
  - using a common web-based knowledge management system?
  - contributing to a common web-based knowledge management system?

The aim of the thesis is to provide a set of answers which together gives a good description and a new perspective in regards to the context. The aim is not to provide one specific answer that applies to all individuals and all kind of situations.

2.5 LIMITATIONS

The thesis is limited to department A and the KMS, the platform, described in section 1.2. Department A consists of five design engineers which have provided some content for the platform where they've described typical routine work. Although one goal is to deploy and use the platform within the whole company of Sandvik, this study will not take that into account. The platform will serve many purposes but the focus of this study will be the features of information (and knowledge) sharing.

Among all the possible reasons for the employees to use a KMS for knowledge sharing, this thesis focuses on those that are about meaning-making. More specifically, what it is in the process of contributing to a KMS and using it that creates meaning for the selected employees.

The study focuses on knowledge sharing between the individuals and does not look at knowledge sharing at team or organization levels. Although answers to the research question may reside within fields like psychology and business management, this study will concentrate on the fields of pedagogics and qualitative research and with some help from human-computer interaction for the discussion.

3 THEORY

This chapter addresses the theoretical foundation for the thesis, along with related terminology. Two bigger different perspectives on learning are presented and the use of them is motivated.

3.1 A POSTMODERN PERSPECTIVE

Is the reality constructed out of individuals consciousness or does it exist *outside* and *independent* of the experiencing person? Two philosophical positions which tries to answer this question are positivism and postmodernism. Positivism, which revolted against religious views of the world in the middle of the 19th century, assumes that the world can be described using unbiased, unambiguous and reproducible data free from human values (Kvale, 1997).

A postmodern perspective on the other hand assumes that the world can not be described independently from the humans who lives in the world they experience – man and world can not be separated. Reasons for this includes that the one who describes can not be parted from the description itself and that it is not possible to perceive and experience objectively (Lantz, 2007; Marton & Booth, 2000).

This thesis takes a postmodern perspective throughout, from choices of theories and methods to the final analysis.

3.2 MOTIVATION

According to the Oxford English Dictionary, *motivation* refers to "factors giving purpose or direction to human ... behaviour" and "the reason a person has for acting in a particular way" (OED Online, 2013). These factors are often referred to as *motivators*, but what they refer to can be anything from goals, justice and salary to positive expectations, punishments and much more. The factors are often difficult to verify empirically (Ahl, 2004). There are several theories trying to cluster these factors together in categories, and modeling work behavior, however motivation is a complex topic because of the variety of elements that can influence motivation (Petri, 2013).

One such theory, if not the most widely known, is the hierarchy of needs by the American psychologist Maslow (1908–70). He claimed that behavior is driven by needs which in turn can be arranged hierarchically, from fundamental needs such as physiological needs (e. g., food and sleep) to more advanced ones like belongingness (e. g., interaction with others), ego and self-actualization (e. g., creative and

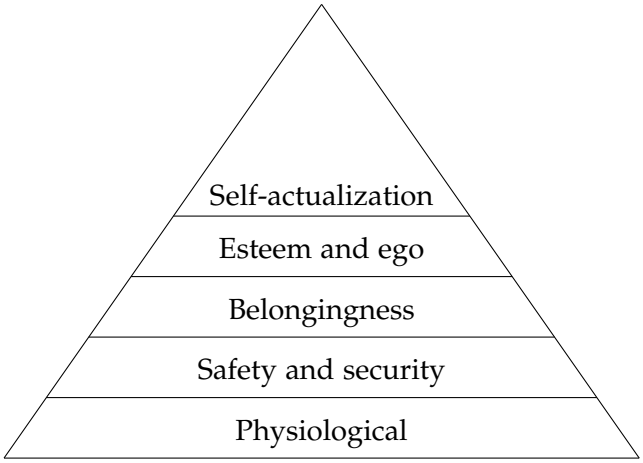

Figure 1: Maslow's hierarchy of needs as given by Porter et al. (2003).

challenging tasks) (see Fig. 1). When needs of one level are satisfied the needs of the next level will begin motivating behavior (Porter, Bigley, & Steers, 2003).

According to Ahl, Maslow claimed that the arrangement of needs is not strictly hierarchic and that needs do not need to be completely fulfilled to move between the levels (2004). Maslow's theory has been criticized because of the lack of empirical data and supporting research evidence (Ahl, 2004; Porter et al., 2003).

Another theory is Herzberg's Motivator-Hygiene theory. In this theory, *motivators* are factors directly associated with the work task (e. g., the task itself, result, responsibility and advancement possibilities) and *hygiene*, or *maintenance*, factors refers to non-job-related factors. Examples of maintenance factors include company policies, salary, relationships with coworkers and impacts on privacy. What these hygiene factors have in common is that they affect behavior more when absent than present, they are necessary but not sufficient factors and can by themselves only result in temporary satisfaction according to Herzberg. He argued that to fully achieve satisfaction and motivate behavior, focus need to be on motivators (Ahl, 2004; Porter et al., 2003).

Deci and Ryan defined two broader classes of motivation – *intrinsic* and *extrinsic*. Venkatesh and Speier (1999/2003) gives a summary of the difference between them:

> Intrinsic motivation refers to the pleasure and inherent satisfaction derived from a specific activity . . . while extrinsic motivation emphasizes performing a behavior because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity such as increased pay and improved job performance. (p. 271)

Frey, as quoted in Ahl (2004), argues that intrinsic motivation is superior to extrinsic, it also leads to an increase in learning and cre-

ativity. However, as extrinsic motivators are affected by context and individual differences, it is difficult to argue that intrinsic motivators are better than extrinsic in general.

It is not always clear which class a motivation factor may reside in, some may even overlap them both. In the end it is up to the interpreter if a factor is intrinsic or extrinsic (Vuori & Okkonen, 2012).

Self-efficacy, almost like self-confidence but more specific to a task, refers to when a person believes that he or she can manage a task in a certain situation. The higher the self-efficacy is, the higher is the probability that the person will take on the task (Ahl, 2004).

Ahl argues that the problem with motivation is the diversity of concepts it provides and that theories about motivation tend to categorize and marginalize people while favoring ways of thinking and working over others. Factors residing within persons, like self-efficacy, are constructed concepts whose existence gets justified by the continuous usage of these concepts. Causation between motivation factors and behavior is often incorrectly assumed. According to Ahl, it is doubtful if motivation can be seen as an independent, identifiable and measurable phenomena. However, the theories provides us a diverse language with which behavior can be described.

Ahl takes a social constructionist point of view and instead proposes to look at motivation as something relational rather than "essential" (compare with the difference between positivism and postmodernism in section 3.1). As motivation becomes socially constructed, it raises questions of who defines it and why. Ahl points out that motivation theories has been used as a tool of power where company management used motivation theories to increase productivity resulting in blame being put on individuals not being motivated rather on existing structures.

Thus in this perspective of power, a research question of "what motivates employees to share their knowledge through a knowledge management system" also include the question of who it is that wants these employees motivated and why.

3.3 LEARNING

When speaking about knowledge sharing it might sound as knowledge is something that can be passed around freely, like as if it was being shared from one person to another in the form of an object. Knowledge sharing implies that someone is *learning* something, assuming that a process of learning takes place. In theories about learning today knowledge is not a commodity but rather something that is reconstructed within and between individuals. To better understand knowledge sharing in the context of employees sharing knowledge, with or without using ICT, learning needs to be further defined. This

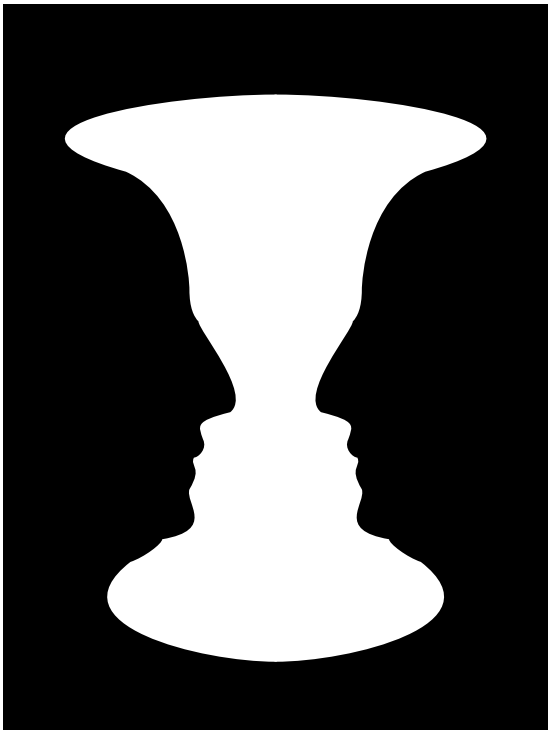

Figure 2: Figure-ground vase, an optical illusion by Danish psychologist Edgar Rubin.

section presents three theories: learning and awareness; transformative learning and a design-theoretic multimodal approach to learning.

Learning and awareness

In trying to answer the question of why some learn better than others, Marton and Booth (2000) describes a perspective on learning where the most fundamental learning is *to experience something*. The ways one experience phenomena does not reside within individuals or in the world, but are rather descriptions of internal relationships between persons and phenomenas. These are reflected in statements made about the world, performed actions and created artifacts.

The key to experience something is to be able to on one hand discern the whole from the context, on the other units and aspects to the whole. New experiences are made when several units or aspects and their relationships are simultaneously part of one's focal awareness (Marton & Booth, 2000). Figure 2 illustrates the following example: simply put Figure 2 is a black rectangle with a white shape inside of it. However, an optical illusion of two opposing faces and a vase appears when the separate units, the background and the foreground, are simultaneously discerned and focused.

There are two aspects to experiencing something, a structural and a referential. The structural aspect is composed of an external and an

internal horizon. The former refers to what surrounds the phenomena, like context and other connections. The latter is the parts and their relationships making up the structure. The referential aspect provides meaning to the structure, and vice versa. For Figure 2, the paper with the description and surrounding text, creates the external horizon while the black and white shapes make up the internal horizon. Referential aspects include the vase and the two faces because we perceive the shapes as such.

Thus, learning is then the transition from an undifferentiated and less coherent understanding of the whole, to a greater differentiation and integration of the whole and its components. As to why some learn better than others, Marton and Booth (2000) mean that there are qualitatively different ways of experiencing something. For example, when students were given a text to read and understand in their research, two qualitatively different ways of approaching the task were noticed. The students who focused on the designated, the text itself, had a "surface approach" to learning. The other students who focused on the designation, the meaning of the text, used a "deep approach". For those with a deep approach, several parts of the text were simultaneously part of the students focal awareness, instead of one at a time, giving rise to the bigger picture and a better understanding of the text (Marton & Booth, 2000).

These approaches to learning vary between person and situation, as they are combinations of how learning is experienced and how situations are experienced in terms of what they require. The limited[1] qualitatively different ways of experiencing phenomena can be understood as the variation of combinations of how units and aspects are discerned and simultaneously focally aware at certain points in time. Understanding how people experience problems and situations enables an understanding of how people handles these problems and situations, so to understand how employees approach knowledge sharing it is necessary to understand the way they experience it. Marton and Booth (2000) even says that competence at work depends more on how one sees their job than the amount of years and training one has.

Transformative learning

The theory of transformative learning complements the theory on learning and awareness by Marton and Booth as to why different people sees and discerns different aspects. Developed by Jack Mezirow, the theory of transformative learning is about discovering and exceeding frames of references through critical (self-) reflection. Rais-

1 If there was unlimited number of aspects defining phenomena, then we would have experienced phenomena differently each time, resulting in us being unable to communicate about them.

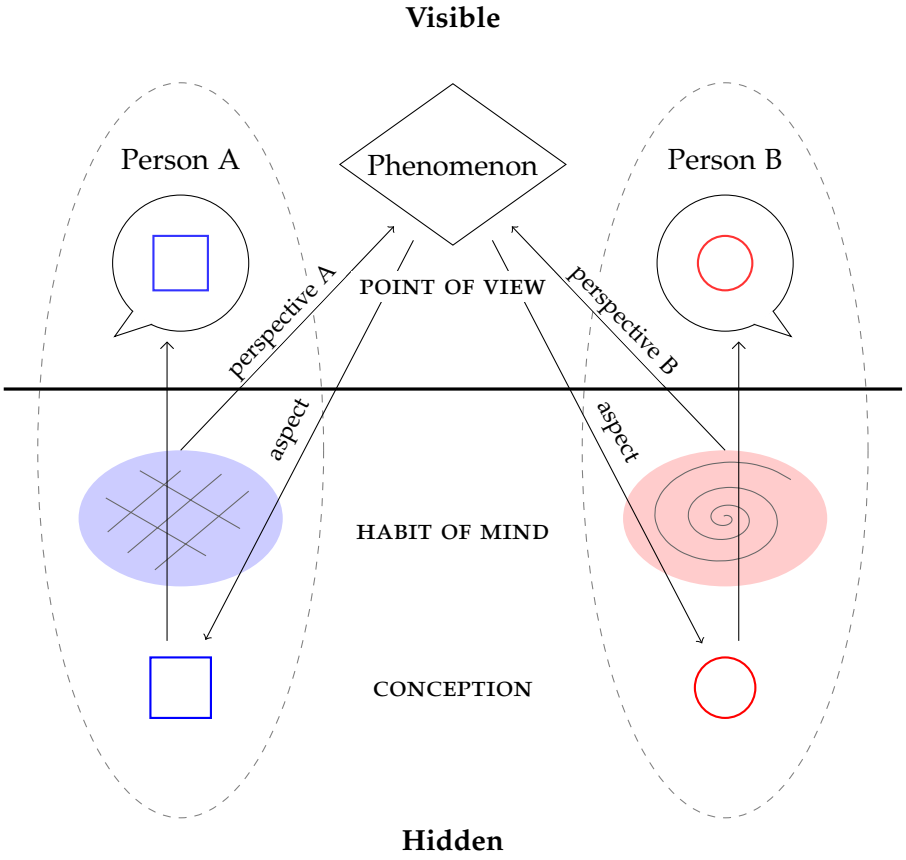

Figure 3: A certain habit of mind gives a certain perspective from which certain aspects of a phenomenon are discerned. This perception is then filtered through the habit of mind, creating a conception. This conception is then verbalized through a point of view. Adapted from Bron and Wilhelmson (2005, p. 66) with added colors and own translation.

ing awareness about things that are taken for granted and seeing things from different perspectives leads to transformative learning. The frame of reference is what becomes transformed (Bron & Wilhelmson, 2005; Mezirow, 1997).

According to Mezirow (1997), a frame of reference consists of two dimensions: a *habit of mind* and a *point of view*. Social and cultural codes make up deeply rooted assumptions which influence broad orienting ways of thinking, feeling and acting – *habits of mind*. They work as a filter when making meaning, a fitting metaphor could be a compass. When articulated or made concrete they constitute a specific point of view, something less durable. An example of a point of view could be feeling good avoiding meat because the habit of mind is vegetarianism.

When experiencing or interpreting a phenomenon, the habits of mind gives the perspective from which certain aspects are perceived

(Mezirow as cited in Bron and Wilhelmson (2005), see Fig. 3). Therefore different approaches can be connected to different habits of mind.

A design-theoretic, multimodal approach to learning

For a time which is characterized by new media, new ways of communication, globalization and changing social relations between people, older perspectives on learning may not alone suffice. Supplementing existing theories, a design-theoretic, multimodal approach to learning focuses on the modes individuals use to represent and shape their understanding (Selander & Kress, 2010).

Multimodal means that communication takes place in several modes at the same time – a website may use both text, pictures, video and even interactivity to get the message through. These modes each have their potential and limit – some things are better said with pictures than text. Each mode consists of signs which are the available resources for interpreting the world and make meaning, for example the letters of the alphabet. When signs are combined together in a certain way, they form a *representation*, an expression for how a person understands the world.

Communication is traditionally described in terms of a message going from a sender to a receiver. The design-theoretic approach however starts off with a given *setting* where something is focused, the "message". A *participant*, corresponding to the receiver traditionally, transforms the information and forms a representation using available resources, that is, the modes and the media. The representation reflects the participant's understanding, "we show what we understand by showing how we understand" (Selander & Rostvall, 2008, p. 38, own translation). Thus, communication becomes a multimodal, communicative and sign-making activity rather than "transmission".

This creative process involves several choices, from how the setting is arranged and interpreted to how the participant chooses to form the representation. In other words, both the arranger and the participant are *designers*, they make decisions based on interest.

Selander and Kress argues that one can only "see" signs of learning and not learning itself. A difference in understanding at two different times is understood as *learning*, thus learning is the process which is distinguished by an increased ability to use available signs and modes in different media.

3.4 KNOWLEDGE

A KMS implies a system managing knowledge, but what can be considered *knowledge* and can it be managed? One way to define knowledge is to compare it to data and information. Data provides a basis for information and knowledge, it is without meaning and often

quantifiable, like observations and facts. When seen in a meaningful pattern and given meaning, it becomes information – an analysis of data. When reflected upon and put into context through one's experience it becomes knowledge, a productive use of information (Oye et al., 2011; Pasher & Ronen, 2011; Roberts, 2000). Although this suggests that there is a hierarchic relationship between data, information and knowledge, where each one precedes the latter, Roberts (2000) adds that although knowledge is dependent on information, the creation of relevant information requires knowledge.

An example, as inspired by Oye et al. (2011), would be: if the temperature outside is twenty degrees Celsius, then twenty degrees is the data. Information could be if this is hotter or colder than the day before. Knowledge is knowing whether it is warm enough to leave the jacket at home.

A design-theoretic approach describes knowledge as ways of acting and communicating that are perceived as stable, meaningful and have been acknowledged as knowledge in a social context. Because knowledge is seen through communication in the use of representations – which shows how one represents and understands the world – knowledge is the ability to use signs of a knowledge domain (Selander & Kress, 2010; Selander & Rostvall, 2008).

Previous research on knowledge management systems distinguishes two forms of knowledge – tacit and explicit knowledge. Tacit (or procedural) knowledge is understanding and choosing appropriate actions in a situation subconsciously (Selander & Kress, 2010). For example, the tacit knowledge one has for using a keyboard and a mouse makes it possible to browse websites and concentrate on the content rather than on how to work the input devices. Because of its characteristics, it is difficult to formalize and communicate unlike explicit knowledge, which can be transmitted using symbols or embodied in a tangible form, like machinery (Nonaka & Takeuchi, 1995). In other words, the knowledge which a KMS can manage is explicit knowledge, because it can by definition be stored, distributed and accessed in digital forms (Oye et al., 2011). Contributing to a KMS involves a process of *combination*, as the individuals explicit knowledge is combined with that of the KMS. This process can lead to the creation of new knowledge (Nonaka & Takeuchi, 1995).

Roberts (2000) among others argues that tacit knowledge (often referred to as *know-how*) requires face-to-face demonstration, *show-how*, to successfully be shared. However, the interpretation of Polyanis' work by Selander and Kress (2010) suggests that the difficulty in sharing tacit knowledge does not reside in the knowledge itself but because it is in the "background". When it is focused on it can be communicated in the shape of explicit (codified) knowledge, for example through a KMS. This process, a *knowledge conversion* between individuals, involves externalization, combination and internalization

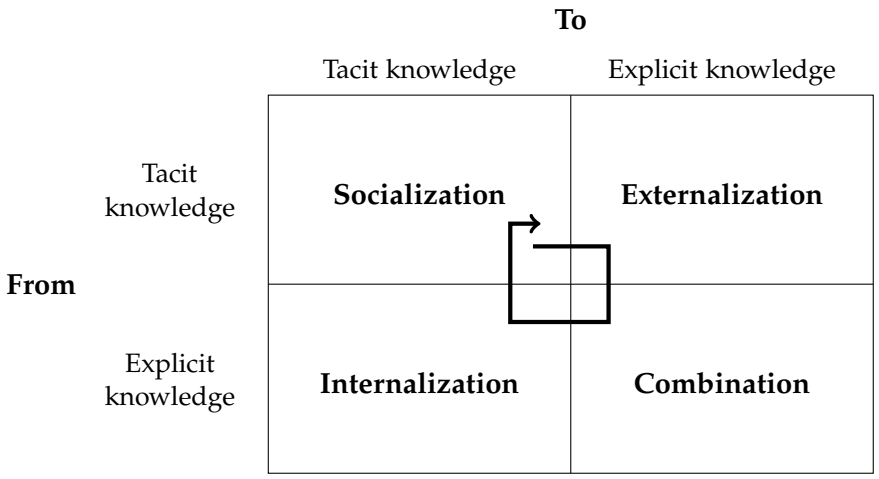

Figure 4: Interaction between tacit and explicit knowledge, adapted from Nonaka and Takeuchi (1995). The arrow depicts how knowledge is converted when shared through a KMS.

(see Fig. 4) (Nonaka & Takeuchi, 1995). On the other hand, when tacit knowledge is "implicitly" demonstrated or observed, tacit knowledge becomes tacit knowledge through a process of socialization (Nonaka & Takeuchi, 1995), or *show-how* (Roberts, 2000).

In summary, knowledge is situated and productive use of information. It is always given a *shape*, that is, stable ways of acting and communicating. This shape can be considered tacit or explicit depending on how it is focused and represented. When knowledge is shared, its form is converted between tacit and explicit respectively. Content within a KMS that is not data or information can be explicit knowledge, but this is not *the same knowledge* which was shared, it is just one form of knowledge. That is, one form of communication.

3.5 KNOWLEDGE MANAGEMENT SYSTEMS

At this point we know that a KMS is a system which can manage knowledge, but what more qualifies a system as a KMS? This thesis uses the definition by Alavi and Leidner, that is, they are "IT-based systems developed to support and enhance the organizational processes of knowledge creation, storage/retrieval, transfer, and application" (Alavi & Leidner, 2001, p. 114). For example data warehouses, intranets and software agents (Hall, 2001).

Information Management System (IMS) is sometimes also used to refer to these kind of systems, as they can store, organize and retrieve information (Daintith, 2004). Another reason might be because of the ongoing discussion on knowledge sharing on whether it is the information or knowledge that is shared (Agrawal et al., 2011). As explained in section 3.4 this thesis uses a definition of knowledge

so that it in fact can be shared using technology, so the term KMS is preferred over IMS for such systems.

Some of the benefits of using a KMS is storing best practices so one does not need to "reinvent the wheel", faster execution of routine tasks, aggregation of scattered information and less dependency of present employees (Agrawal et al., 2011; Hall, 2001). On the other hand, using the best IT system for knowledge sharing does not on its own increase organizational performance. There needs to be content that matters, like information resources and applications (Hall, 2001), and the employees must perceive the IT support as useful (Agrawal et al., 2011). If they don't perceive it as such, it doesn't matter how great the system and its features are. Roberts adds that the use of IT for knowledge sharing is more successful when those involved share "common social, cultural and linguistic characteristics" (Roberts, 2000, p. 434).

3.6 WHY SHARE KNOWLEDGE?

What reasons might there be for employees to share their knowledge, with or without the use of technology? Previous studies points at several factors, motivators, and also *demotivators* for not doing so. These can be seen as intrinsic or extrinsic, whether it is internal or external to the individual and the task. Some are maintenance factors – their absence leaves dissatisfaction but their presence not so much noticeable satisfaction. However, factors should not be seen as exclusively intrinsic or extrinsic, as they can be part of both depending on perspective. Previous findings are presented here so that to notice any recurring patterns and the generalizability of this thesis' results later on.

In general, employees are motivated to share knowledge when it feels useful and practical to do (Vuori & Okkonen, 2012). More specifically this includes the following key motivational factors, as summarized from previous research by Vuori and Okkonen (2012):

- contributing to organization's success;
- getting incentives and rewards;
- feeling empowered;
- getting knowledge in return (reciprocity);
- boosting own reputation;
- adding value to knowledge; and
- trusting that sharing is worthwhile.

Hall (2001) adds that some people find pleasure in sharing knowledge, because it demonstrates altruistic behavior making other reasons obsolete. Most of these factors can be considered intrinsic, which is consistent with research findings that intrinsic factors are more significant when it comes to affecting behavior. An organization can foster knowledge sharing by creating environments which encourages experimentation and where knowledge sharing is a key responsibility (Hall, 2001). Other strategies that have been proved to be fruitful is the use of *coaches* (Roberts, 2000) or *ambassadors* (Brazelton & Gorry, 2003) – selected employees which can showcase the software and demonstrate knowledge sharing scenarios for others to take part of.

Some of the demotivators found are opposites to motivators, for example when it doesn't make work easier (Vuori & Okkonen, 2012). Other examples of demotivators include, as given by Oye et al. (2011):

- advantages in holding knowledge;
- personal animosity or traits;
- when shared knowledge is not used, comprehended or accepted;
- confidentiality and job insecurity; and
- lack of sharing culture.

These factors apply to sharing knowledge in general at a workplace, when technology is involved it brings along a few demotivators together with the possibilities. For example: inability or unwillingness to use technology (Oye et al., 2011), *just another information system* and that it consumes more time and effort than necessary (Vuori & Okkonen, 2012). For the individual, this is time that may be better spent at work related tasks with more noticeable rewards. From an economic perspective it is therefore better for an individual to use a KMS but not contribute to it (Cabrera & Cabrera, 2002; Lam & Lambermont-Ford, 2010). This kind of opportunistic behavior has been referred to as to free-ride (Cabrera & Cabrera, 2002), lurking (Brazelton & Gorry, 2003) or the more sophisticated *legitimate peripheral participation* (Hrastinski, 2009).

However if nobody contributed to a KMS, there wouldn't be any gains in using the system. But at the same time, there would be less individual incentive to start contributing, because efforts would exceed individual gain. This creates a state of *deficient equilibrium*, which gives less potential gain for the group but good enough balance for no individual to affect it (Cabrera & Cabrera, 2002). But these deficiencies for the group and the individual can motivate knowledge sharing, acting as maintenance factors (Quigley, Tesluk, Locke, & Bartol, 2007). There just needs to be some assurance that everyone is doing it (Cabrera & Cabrera, 2002), which makes knowledge sharing somewhat of an end in itself.

3.7 MEANING-MAKING

To answer what is creating meaning for the employees in using and contributing to a KMS, meaning-making itself must be defined. What happens when people create meaning out of something and how does meaning-making differ from motivation? This thesis' view of meaning-making is in line with the theories used in section 3.3 by Marton and Booth and Selander and Kress when describing learning.

At a fundamental level, meaning is derived from what is emphasized when experiencing something. It is the pattern of what is discerned and focally aware. If everything – all aspects and units – was part of one's awareness then there would be no differentiation, no foreground or background, resulting in no structure to the world. The meaning would be *total* and with that it would be lost (Marton & Booth, 2000). In other words, learning and meaning-making both derive from the ability to *experience*[2]. But learning and meaning-making is also what creates the basis for interests, likes, wishes, abilities and experiences. These characteristics and past experiences in turn affect what it is that one emphasizes when experiencing something new, so it all comes full circle.

At a less abstract level, this comes down to *choices*. Meaning derives from the distinctions we choose to make and appears using the signs and modes we choose over others. This (re-)design process, when transforming information and creating representations, is a process of meaning-making (Selander & Kress, 2010). This implies that different signs, modes and media offers different possibilities of meaning-making. In Figure 2 the vase is given a simple shape to convey the optical illusion. A photo of a vase on the other hand might mediate that the meaning of a vase is something to hold water and flowers. The media does not reflect reality, it is part in constructing it (Engström, Enbom, & Lindgren, 2012).

However, a vase – or any other object, gesture, word or symbol – doesn't mean anything in itself. It is the social context in where it appears that provides meaning, as it is negotiated and agreed upon between social beings. The social context is in turn the result of ongoing (re-)design which in turn affect how people can interact and the conditions for communication. This is how norms, routines and traditions emerges, as attitudes are negotiated, constituted, legitimized and recreated over time. This can facilitate the daily work, as life would be unmanageable if one would always question and seek meaning. But at the same time it can be a barrier when it comes to implementing changes (Ahl, 2004; Selander & Kress, 2010).

2 This is consistent with a design-theoretic perspective which sees learning and meaning-making as two sides of the same activity (Selander & Kress, 2010).

4

METHOD

This chapter describes methods used in this study, from the use of post-it notes in supporting the process to qualitative interviews and the following transliteration and analysis in search of answers to the research question.

4.1 QUALITATIVE METHODS

Depending on the purpose of the thesis, the use of qualitative or quantitative methods should be considered. Qualitative methods seeks to *understand* while quantitative are used to *measure*, the result becomes meaning or information respectively. For example, a qualitative interview uses words like *who*, *how*, *why* and *in what what way* (Lantz, 2007; Nyberg, 2000; Olsson, 2008).

One key aspect of qualitative methods is that it sees the researcher as part of what is to be understood, taking a postmodern perspective (see section 3.1). There are no unprejudiced interviews. The personal interaction between the interviewer and the respondent together with the background of the interviewer affect the outcome of the interview. Not only does the interviewer need to know the topic well, but also have experience in social interaction (Kvale, 1997; Lantz, 2007).

One common objection against qualitative methods, interviews in particular, is that they are subjective rather than objective. Kvale (1997) argues that they are neither. Instead it is the intersubjective interaction that constitutes the interview. Objectivity in itself is also an ambiguous term. Freedom from bias can be reached through reliable and verified research along with critical reflection to see bias. Also, if several researchers can reach similar findings, then there is intersubjective consensus.

Quality control within quantitative methods is usually done by looking at the validity and the reliability of the methods. In qualitative research validity comes down to if the study has throughout researched what it set out to do. For example, are the interview questions valid to the research questions? The choice of language for the transcriptions also affects validity as a less verbatim transcription may not bring forward the answers the study is looking for. Reliability comes down to the consistency of the results. How different would the transcriptions be if several researches made them? Too much emphasis on high reliability regarding interview responses can however counteract the researchers creativity and variability (Kvale, 1997).

As this thesis wants to understand the meaning in using a KMS, it used qualitative methods and in particular qualitative interviews.

4.2 SUPPLEMENTARY METHODS

For overview and seeing the whole picture of this project, methods including paper sheets of size A3 and upwards together with post-it notes was used. For example, one large paper sheet was divided into the key parts of this thesis: purpose, research question, methods, results and analysis. Post-it-notes describing the current purpose, question and so on was placed in each section. Whenever something changed in the process, this "map" was helpful in visualizing the bigger picture and any affect on other parts.

4.3 PRE-STUDY

In the process of narrowing down the research question and finding interesting leads to follow up on, a pre-study took place. The purpose of the pre-study was to examine if there had been any similar knowledge sharing projects conducted at Sandvik. If so, then the experiences made and any traps to avoid would be of special interest. As it turned out, in 2009 a web-based community was built for knowledge sharing and networking within one of Sandvik's research areas. An open-ended phone interview was conducted with the project leader to investigate what had been successful and what not. See appendix C on page 53 for the interview guide that was used.

As the employees of department A was using the platform during the pre-study, although while it still being in early development, another point of interest was to observe any spontaneous reactions to the platform itself and the idea of using a KMS. During the development and the pre-study, the employees was invited to two demonstrations where the platform and its upcoming features was showcased. The feedback that the employees gave during these demonstrations was written down, in case it would be of value in the upcoming main study.

Although the pre-study did not seek to provide answers to any specific question, but rather find areas of interest, the thesis have made use of the results and notable findings from these less formal methods where applicable. Note that the pre-study should not be confused with that of a pilot study (which is a study similar to the main study in choice of methods but on a smaller scale). If anything, this thesis might serve as a pilot study for any future research on the platform.

4.4 LITERATURE RESEARCH

The sources this thesis use was mainly found through supervisors suggestions and the use of online databases. Primo[1], a search tool served by the KTH library, was used as it has access to several databases

1 See http://www.kth.se/kthb

of scientific journals, articles, e-books, theses and alike. Additionally the library of Stockholm University was used for both online resources and books as they provided more resources within pedagogics. Some books were loaned at the Stockholm Public Library, but these were mainly on methodology rather than on the subject of the thesis.

The databases were searched using combinations and synonyms of the following keywords: meaning-making, motivation, information and communications technology, knowledge sharing, knowledge management and knowledge management systems. References to articles close to the research question was also further looked into. Some sources was given lower priority because of insufficient scientific presentation; for example when the article had not been peer-reviewed or when the authors were not part of any university or institution.

The main theories chosen for this thesis are close to the fields of pedagogics. As previous studies are mostly from the fields of business and knowledge management, this compensates and brings a new perspective on the research issue. As technology and social media have become more significant in peoples lives, it was also of interest to find recently developed theories with this in consideration.

4.5 QUALITATIVE INTERVIEWS

User surveys, interviews, workshops and questionnaires was discussed as to which one would best be used to answer the research question. User surveys with observations of usage, employees "thinking aloud" and answering questions, was considered to put too much emphasis on the interface of the prototype. Questionnaires, while an effective method to reach a large number of respondents, seemed less appropriate for the few employees of the department. Individual interviews was chosen over workshops as they would point to differences and similarities between the employees. Workshops would also be difficult to implement, as it would require all, or most of, the employees to leave their work behind and gather at the same time. Finally individual interviews was chosen to best fit the study and the research question.

Interviews can be distinguished in degree of structure, from open to structured (Lantz, 2007). Open interviews lets the respondents talk freely about their experiences using questions without given answers, and wordings like *describe* and *explain*. These let the respondent decide the context. An interview is structured when the interviewer decides the context rather than the respondent. Open interviews can deepen the understanding of a phenomena, as the respondents provides nuances to existing theories. As this thesis aim to reach new

ground in the research area, rather than applying and confirming theories, the qualitative interviews used a more open structure.

Out of the five employees at department A, three was selected for interviews as one was hired too recently and the other was too involved in the project. To compensate for the low number of participants and avoid an unilateral basis, employees of a nearby department, both spatially and task-wise, was asked to participate. Although the employees from this neighbor department, from here on department B, was not part in testing the platform some of them were aware of it. Therefore in the interviews with those from department B, the employees would have to reflect around if the use of the platform would create meaning for them, after hearing a description of the platform. Although these would be more hypothetical, they would contribute more perspective to the analysis. As three employees from department B chose to participate, a total of six interviews was conducted.

These six respondents were all males with a time in the company from one to ten years and with background in mechanical engineering. The head of each department was both participating. Except for the managers who does more administration, all of them take on tasks like designing tools using CAD software, documentation and support for their quotations and orders. A brief description of the respondents is given below, with the first three from department A and the latter three from department B. To comply with research ethics, the names of the employees have been changed (Vetenskapsrådet, 2002). The descriptions are important for the analysis to be more qualitative than quantitative.

ADAM: In his twenties, three years at the company. Regarded within the department as one of the most experienced and responsible for teaching newer employees. Likes being involved in tool development and sees the platform as a *forum* where users can discuss task instructions.

ARTHUR: In his twenties, one year at Sandvik. Responsible for "creating as many quotations as possible". More interested than active with new technology. Best part about the job is designing new solutions and being part of a group. Sees the platform as a *database* of how work tasks should be executed.

ALBIN: Head of department A, in his thirties and at Sandvik for six years. Responsible for developing work methods and that the department delivers. Says he's not the kind of person that "surfs the web just because he ain't got nothing to do". The best part about the job are new challenges and being part of developing cutting edge technology. The platform according to Albin is a "collection of experiences and largely how we should work".

BEN: In his thirties and two years at the company. Uses computers mostly as news feeds and does not use social media; "why be there when one can meet people in reality?" The best part about the job is that one gets to construct and create. Before the interview he was only slightly aware of the platform.

BRIAN: In his thirties with six years at Sandvik. Not a "stranger to computers" but at the same time feels left behind the rapid progress of IT. Being creative and think a lot is what he likes most about the job. Brian knew briefly about the concept of the platform and had to be more introduced at the beginning of the interview.

BILL: In his fifties and have been in the company for more than 10 years. Head of department B. Responsible for his staff and planning. When it comes to computers and IT he feels tired of having to learn new systems, especially if it doesn't work. The best thing about work is the chance to be creative and help clients out. Was aware of the platform and sees it as *one place* with information about daily routines and tasks. For the information "one can't hold inside the head".

Each interview began with describing the purpose of the interview and guaranteeing their anonymity. To avoid normative responses, they were told that the main concern of the thesis was how they themselves reasoned about the platform. They were also told that they were free to abort the interview at any time. With the respondents consent, the interviews were recorded using two cellphones, one for backup in case anything would go wrong. No notes were taken during the interviews to avoid early unsystematic data reduction and disturbing the interview process (Lantz, 2007; Nyberg, 2000). Following the formalities, there were four parts to the interview: introduction, questions regarding using the platform, questions regarding contributing to the platform and concluding questions.

The interview guide was designed to have few questions followed by questions like *why* and *why not* to allow for the respondent to deepen their reasoning. As the term meaning-making was considered too straight-forward and somewhat unusual, they were instead asked to elaborate on what made, or could make, the platform feel *meaningful*. To have some context provided for their answers, they were asked how they would describe their "IT-personality" and what they liked the most and least about their job, so as to see what they found meaningful more in general. As it had been noted by the initiator of the project behind the platform that valuable time was spent when employees asked each other for help, a question was included to seek the employees own opinion about the matter. The interview guides can be found in appendix A and B, for the interviews done with the

employees of department A and B respectively. All interviews were conducted in Swedish.

4.6 TRANSCRIPTION

The interviews were transcribed to ease the analysis process and create visual overview. The software VLC[2] was helpful in this process as global keyboard shortcuts made it possible to pause and move backwards in the recordings while still having focus in the text document. The ability to play the recording slower and faster also helped in making out the recordings and speeding up the process.

The first part with questions about the employees was not transcribed word for word, but instead concentrated and summarized by question. The other three parts to the interview were transcribed more verbatim, but pauses, emphases, laughs and alike were left out except for some significant ones. Ideas for the analysis that showed up during the transcribing process was noted in a separate document. The complete transcriptions were revised so that sections with less importance was colored differently. The transcriptions were not added as appendices to the thesis due to extent and to comply with research ethics, keeping the employees unidentifiable.

4.7 ANALYSIS METHOD

The purpose of the analysis was to find appearances of meaning-making in the transcriptions. This was done using both intuitive interpretations and more formal procedures, supported by the theories of this thesis. Rather than using some standard analysis procedure, the analysis was done *ad-hoc*, that is, different methods combined to both create an overview and point out details (Kvale, 1997).

First off, a custom-made analysis method was developed and used to reduce the amount of data and cluster the answers to the research question. This method was called *chain-of-reasoning* and is similar to the use of mind-maps. It also takes inspiration from Kvale (1997) in that it asks questions towards the transcriptions. The transcriptions was read through in search of possible answers directly related to the research question. For each person interviewed, two sheets of papers was provided: one for what is meaning-making in *using* the platform and one for what is meaning-making in *contributing* to the platform. If an employee named John would had said that using the platform gives him more time, then *time* would be jotted down on a post-it note on the left edge of his paper titled *what is meaning-making for John in using the platform?*

This led to the papers being filled up with unique possible answers grouped by employee and the type of interaction with the platform,

2 A media player, see http://www.videolan.org/

Figure 5: A fictive example of the method *chain-of-reasoning* where the employee John finds it meaningful to use the platform because it frees up time, which he said makes him feel less stressed. This could be connected to his expressed opinion towards computers also given in the interview.

usage respectively contribution. The next step of chain-of-reasoning was to seek possible reasons for each answers, using the information provided by the employees and a series of why-questions. For example a question like "why is it meaningful for John to have more time?" could be asked whereas the answer to that could have something to do with what John felt best about in his work. Explicitly told reasons during the interviews was put as post-it notes close to the answers while suggested implicit connections was placed farther away (see Fig. 5). All these chains of reasonings were then compared and combined where similar thus creating a mind-map with forks where the employees resonated differently. Lastly, the answers and reasonings was categorized into central themes using motivational theories as a "filter".

The method was however limited by the expressiveness of the respondents. To go beyond what was directly said and to make the analysis more qualitative, a theoretical framework was built. This was done by describing situations where the employees interact with the platform in terms supplied by the theories chosen of this thesis. This new perspective together with the uttered answers from the interviews sought to bring forward and differentiate the meaning-making aspects. This part of the analysis was guided by an analysis guide which was compiled out of key points by Kvale (1997), Lantz (2007) and Selander and Kress (2010) (see appendix D).

5 RESULTS AND ANALYSIS

In this chapter the results from the interviews are presented and analyzed using a theoretical framework. The framework is built using the theories of chapter 3 applied to typical situations involving the employees and the platform. The analysis is then divided into what is meaning-making in either using or contributing to the platform.

5.1 A THEORETHICAL FRAMEWORK

To better understand and analyze what was said during the interviews, some examples of interaction between the employees and the platform is described in the light of the provided theories. In this theoretical framework the two persons Alice and Bob are used figuratively, they do not resemble anyone involved in this study directly.

The setting of these two scenarios is the open-landscape offices of department A.

SCENARIO 1: As Alice and Bob work individually with designing a similar tool for an order, Bob runs into some difficulties with the 3D modeling software. Since Alice and the others of the department are very busy with work due to deadlines, Bob decides to look into the platform for help. He navigates to the category of the tool he is working on and finds that Alice has contributed a step-by-step guide for the process. He reads the guide, realizes what the obstacle is and manages to complete the design of the tool.

SCENARIO 2: Another scenario to consider is when one employee learns from another through observation, without the use of the platform. As Bob runs into a problem when designing a tool, he considers that the workload of the department is low and calls Alice over. He describes to her where he got stuck and Alice walks him through the process while showing him on the computer. As Alice shows how its done while also speaking about it, Bob realizes what he didn't see and learns a little bit more about the software and the routine.

The framework

Combining the research of Marton and Booth; Mezirow; Nonaka and Takeuchi and Selander and Kress, scenario 1 can be described like this: When Alice contributes to the platform, her step-by-step guide is a representation of how she understands the process – what units

and parts she discerns from the whole when designing the specific tool, her focus or *point of view* . Using the research of Marton and Booth, it is seen that depending on how much is simultaneously discerned, and represented, Alice's understanding of her work can be said to have a surface or deep approach. As she writes down the instructions her tacit knowledge is converted to explicit as the knowledge is externalized. The combination of new knowledge and already existing in the platform is affected by what modes the platform offers (text, images, video etc.) and what ideas the employees have of how the platform should be used. These ideas may reflect their habits of mind.

As Bob follows the instructions in scenario 1, he is able to discern the difficult part and proceed with the task. As he learns something, a process of internalization and transformation occurs (see Nonaka & Takeuchi, 1995 respectively Selander & Kress, 2010). The explicit knowledge of the platform is transformed into a mental representation for Bob, which becomes tacit knowledge as it is internalized. Whether this is to be considered as knowledge depends on if it is contextual and productive use of information and if those others involved in the context regards it as knowledge (see Oye et al., 2011; Pasher & Ronen, 2011; Roberts, 2000 respectively Selander & Kress, 2010). That is, it is knowledge if those in department A see it as such.

The main difference between scenario 1 and 2 is that the latter includes explicit socialization and that the modes of communication are different. This affects what signs are available for making meaning and creating representations. As Alice shows Bob how to solve the problem, there is both the explicit externalized knowledge (what she says) and the tacit knowledge (what she shows) for Bob to transform into representations. The focus of the communication is dynamically determined by both Alice and Bob unlike in scenario 1.

5.2 USING THE PLATFORM

What creates meaning for the employees in using the platform? From the six interviews and the transcriptions that followed several possible answers was found to this question. Instead of giving a complete overview of all the replies, this section will highlight some of the more recurring and interesting themes. Appearances of meaning-making was concentrated into six themes: *One Place*, *Efficiency*, *One Way*, *Quality*, the *Client* and *Sharing* (see Fig. 6 on the next page).

According to the initiator of the platform one of the reasons to create it was to gather information in *one place*, as a way to deal with information overload. That is, better information filtering. The replies from the employees was consistent with this, suggesting a normative approach to what is meaningful about the platform. The reasons for why they wanted there to be a *one place* were different among the em-

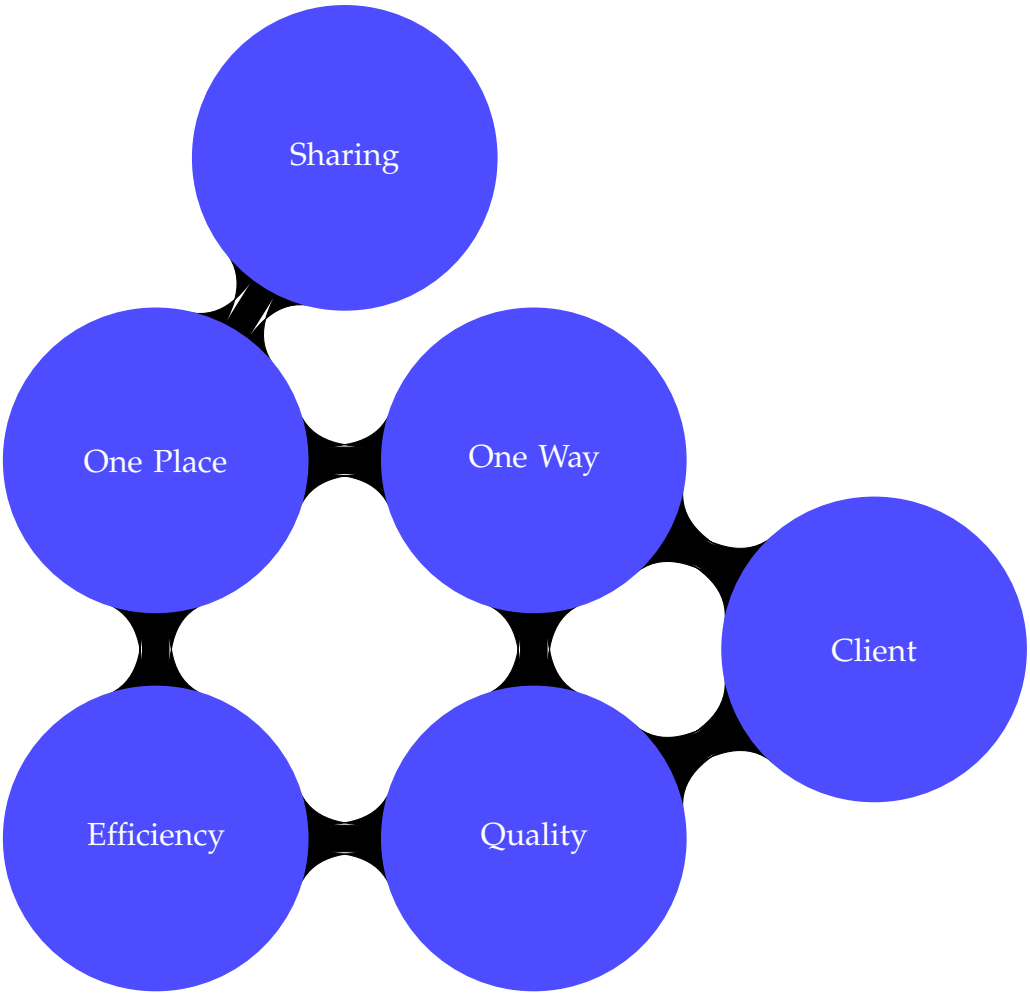

Figure 6: Meaning-making aspects of using the platform, concentrated into six themes. The lines between the themes resemble connections.

ployees. Arthur spoke about it as one place where their knowledge can be archived and looked up when others are busy or not available (see scenario 1 in section 5.1). The platform can provide availability for him. For Bill it was about structure, having one place provides clarity and relieves stress. This is consistent with Bill's general attitude towards IT systems. Adam mentioned *one place* in the context of having some place where lots of people can write together. He argued that in a bigger context with more departments involved, the use of one place with all the information could reduce the amount of questions he need to answer. But in the current context he is fine with taking questions from his colleagues, toning down the "minimize time spent on asking colleagues"-benefit suggested by the initiator.

Having one place for the information and knowledge about daily tasks, instead of several resources, affects the *efficiency* for the group and the individuals. Efficiency is seen here as either *simplifying* or *speeding up* a process. The interface and navigation should be simple, as other resources are not so easy to use according to Ben. By using the platform, Adam, doesn't need to search and filter all the information resources himself, thus speeding up the process and saving time in daily and repetitive tasks. The common expectation among the respondents is that if the platform can provide information faster and easier, then using the platform feels meaningful.

But why is it meaningful for the employees to do their job faster? What is the meaning-making aspect of having more time? It was mentioned during the interviews that time can be crucial regarding if a *client* wants to continue with an order or not. Therefore they strive towards low lead times as long as it doesn't impact *quality*. More time also means more time for developing new ideas rather than working repetitive tasks, which could affect the quality of upcoming tools. The difference between Sandvik as a company and other competing companies – that they specialize in more expensive constructions but with more quality – is seen at an employee level.

This helps us understand why respondents like Arthur and Bill spoke about the platform as a tool of quality insurance. For Arthur the platform with its user generated content serves as a reference ensuring quality when designing tools. He also thought it would provide somewhere to point in cases when other employees execute tasks in the wrong way. For Bill as the department manager he points out that it is important that the employees work similarly to ensure quality, thus it would be meaningful if the platform held that information; "how we should work". When asked why it is important that they work similarly, Bill mentioned the importance of having satisfied *clients*. By working similarly, and in one way that has proven to satisfy a client, then more satisfied clients should follow.

The respondents seemed to be in silent agreement that there is *one way* to work that is preferable and that everyone should follow when

it comes to designing tools. Similar to the research of Marton and Booth (2000) where it was noted that there are qualitatively different ways of understanding a text, where some understood it better than others, there seem to be not only a better way of understanding the work tasks but also better ways of executing them. This can be seen in quotes such as "I'm trying to be as correct as possible when I work" (Brian), "one does not always know if one uses the right approach" (Arthur) and "what is important for me is that what it says there [in the platform] is correct, and the best way to work" (Adam). It was even explicitly said by Bill that the goal is for everyone to know as much as possible, the same things and work *in the same way*.

All of the employees said however that they have their own notebooks and guides, their own ways, to aid them in their work. If these are their own representations of how they understand the tasks (see Selander & Kress, 2010), then how can using the platform feel meaningful where there is only one, collaborated, representation? One way to interpret the situation is that their notebooks and guides are all individual representations of an abstract qualitatively "best approach". The content of the platform can be negotiated and discussed unlike their own personal guides, therefore they share the expectation that this common representation would be as close to the best *one way* as it can be.

While Arthur said that he thinks the platform can replace his notes, Bill emphasized that his guides are his own and only for himself to understand. One way to see this is, using a design-theoretic perspective, is that Bill's ability to use signs differs between the modes his notebook offers and that the platform can. If the platform were to replace each and everyone's personal written guides, a conflict could arise. Because not only are these guides and notebooks their representations, but also how they understand the tasks at hand.

The last theme of interest was that of *sharing*. When speaking about the communicative aspects of the platform they focused more on how it could be meaningful for the future, unlike the other themes which focused on the now. Although in different contexts, both Adam and Brian thought that the use of the platform could lead to the creation of "smart solutions". It was not explicitly told, but it is assumed to be as the result of several people sharing ideas together over time in one place. Ben highlighted that the platform wouldn't be meaningful unless it becomes a *living document*, also highlighting the communicative aspect. There must be ongoing communication, otherwise it becomes just a place of old information turning it into "just another information system".

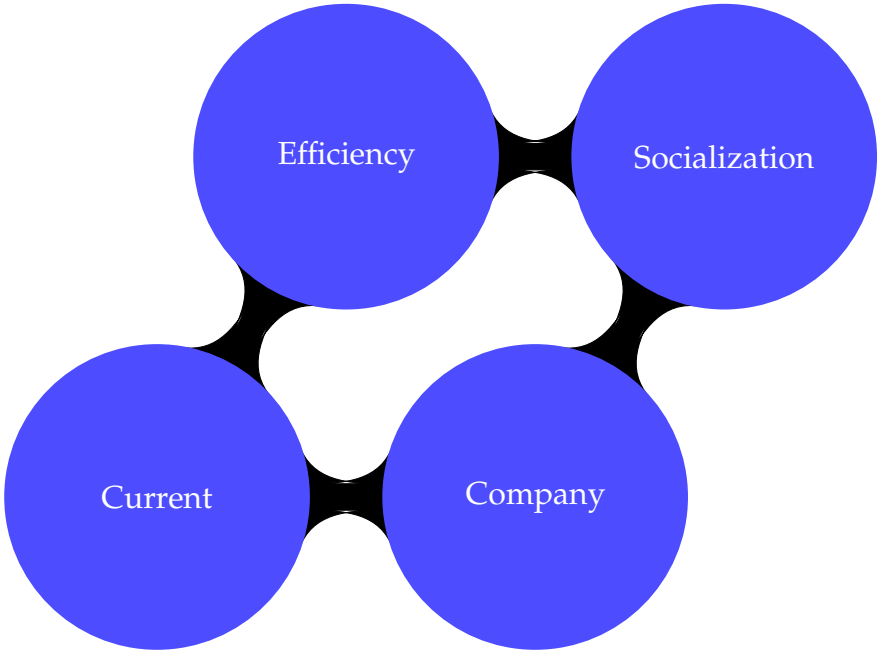

Figure 7: Meaning-making aspects in contributing to the platform, concentrated into four themes. The lines between the themes resemble connections.

5.3 CONTRIBUTING TO THE PLATFORM

What creates meaning for the employees in contributing to the platform? Several of the themes in section 5.2 was also present when the employees spoke about what it is about contributing that feels or could feel meaningful. The themes that this section will focus on have been named *Current*, *Company*, *Efficiency*, and *Social* (see Fig. 7).

In section 2.1 on page 3 where the main problem was defined it was noted that the value of the platform depends on the users participation as the content is user-generated. This was also apparent when Albin spoke about what makes it meaningful for him to contribute to the platform. He highlighted the importance of keeping the platform up-to-date, *current*, and the only way of doing that is by contributing. The reason why it is important to keep the platform current was that when the content gets old and no longer applies, the platform is perceived as useless (cp. Vuori & Okkonen, 2012). Thus, rather than contributing "for the sake of it" it is more of an *maintenance factor* (see Herzberg's Motivator-Hygiene theory in Ahl, 2004; Porter et al., 2003). The focus is more on the dissatisfaction that not contributing gives rather than the satisfaction that comes from contributing. Also, the theories that the IT support must be perceived as useful are at play here (see Agrawal et al., 2011) – this meaning-making aspect of keeping the platform *current* is an essential one and enables other meaning-making aspects to appear. Or as Bill put it: "it doesn't become meaningful if it isn't used".

Continuing on the theme of keeping the platform current, Ben answered that he could see himself contribute just for the platform to "live on". His reason for it was different though as he would do it for the *company* and to satisfy the clients. The company after all are the ones that pays his salary, he said. Ben however mentioned that he would rather contribute by other modes than through the use of IT support, as he thought it is easier to talk to his colleagues when sharing knowledge. How can this be understood using the theoretical framework in section 5.1? One explanation is that the modes available of making meaning in a context like scenario 2 suits Ben better than those that comes with the use of the platform. Unlike the other employees participating in the interviews, his *habits of mind* seems to differ when it comes to his stance against using technology in this context.

Using the description by Venkatesh and Speier on intrinsic and extrinsic motivation, it appears as Ben's reasons for contributing to the platform is extrinsic – he is doing it for the company. However, he did speak of other reasons for him to simply share knowledge. He said it felt meaningful for him because by sharing knowledge to the group the group would become a "stronger unit". What makes a stronger unit? A stronger unit is a better performing unit and the performance is affected by the *efficiency* of the group.

Helping others being as effective as possible is what drove Bill as the manager of department B. Arthur said that if he knew anything that could affect the speed of tasks, then he would share that knowledge so that at least two in the group would know about it. Because then, if at least two persons knows and uses that information, the efficiency of the whole group would improve. For Adam contributing to the platform would save work in the long run. Brian reasoned that although sharing knowledge can be fun on its own (an example of altruism, see Hall, 2001), anything that can improve efficiency is good. "It is after all my work eight hours a day and if that doesn't work then I don't" he said. The meaning-making aspect of efficiency goes in two directions: for the individual and the group respectively.

Contributing to the platform can feel meaningful because it can improve the efficiency of the group. This in turn leads to the sense of a "stronger unit". But it appeared to be something else about contributing that constitutes a stronger unit, something more difficult to define. Albin said for example that contributing results in a feeling of being part-owner, which is assumed as something good to strive for. A design-theoretic approach suggests to look for actions and choices the employees referred to (see Selander & Kress, 2010). The employees' answers pointed towards that the action of *participating*, showing involvement, is itself something that creates meaning. Participation was even spoken of by one employee as more important then that the contribution itself was correct. A key factor to why participa-

tion showed significant could be that the platform, the number one go-to place, makes it visible which employees have contributed and therefore which have not. If everyone contributes, everyone sees and everyone is involved. Participation becomes an action which helps constitute the group.

Then what are the reasons for them to work together as a group in an open landscape office and not more individually? According to Bill this way of working is different to that of just one generation ago. He spoke about how they worked more individually back then and how there was pride in keeping knowledge to one self. Now however the employees agree that the better way is to share knowledge with each other and cooperate.

> Bill: It becomes something, it turns into something more than 1 plus 1 when one helps each other. That's why we're sitting here together [...] I think it adds value, with help from each other, when working as a group. (Interview with Bill, own translation)

This generational change of working is also reflected in the goals and key performance indicators they work towards, as one employee told that they are not individual but rather targeted for the group. Thus, the other reasons and meaning-making aspects to contributing can be narrowed down to a social element, *socialization*. On one hand the social aspect can be seen as the difference between ways of working at Sandvik one generation ago and now, a difference in the corporate culture. On the other hand socialization is part of what constitutes the group. It is also one of the four modes of knowledge conversion, as seen in Figure 4. Thus, it is essential in the process of sharing knowledge whether it is with or without the use of IT support.

However, it was also said during the interviews that there is a lack of information exchange and knowledge sharing in the departments. One of the questions asked was: "Today, much is said about the importance of information and knowledge sharing. What do you think about that?" In reply to this it was said that although it sounds good, it is not very present within the departments. The reasons for this was explained as a matter of priorities, that the work tasks comes first. So although the corporate culture may have changed and is moving more towards a sharing culture, the employees point of view tells something else about their habits of mind (compare with Fig. 3 on page 12).

Then what does the platform offer the group in terms of socialization? Beyond contributing just to participate – being part of the group – there is another social element made possible by using a KMS as ICT offers asynchronous communication. This communicative aspect was highlighted by Adam when he spoke about how he sees

what is meaningful for him in different levels. Taking part in rewarding discussions with people across time and space was talked about by him as the potentially most meaningful aspect to using and contributing to the platform. Not only would the discussions themselves feel rewarding, but also the challenging process of devising new solutions. This goes beyond reciprocity as the involved members would be part of creating new knowledge. Adam also said that the difference between an active platform and one that becomes unused could be dependent on the platform's potential to support discussions.

5.4 QUALITATIVELY DIFFERENT MEANING-MAKING ASPECTS

As the results show, a wide range of reasons and meaning-making aspects for using and contributing to the platform was mentioned. Even when grouped into themes it is still an imprecise answer to the question of what creates meaning when using and contributing to the platform. Although the aspects were never explicitly ranked by the employees, the themes were approached with different levels of engagement. Some aspects were more talked about and seemed to be more meaningful and significant than others. The most evident example is how Adam talked about how he sees what is meaningful *in different levels* and his hopes for the platform to result in rewarding discussions.

Then why was Adam the only one of the respondents to highlight this aspect? Does the answer lie in what differs him from the other employees? As Adam was regarded as one of the most experienced of the respondents a first guess would be that it is because of his experience. Adam himself however said that he was the second most experienced as an design engineer after Albin, the manager of his department. Albin on the other hand did not highlight this aspect, but spoke much about how the platform could benefit the group. This can be understood as him talking in the role as the manager of the department with responsibility of the employees. In their different roles, Adam and Albin *approached* their work and the platform differently (cp. Marton & Booth, 2000).

It is seen using the research of Marton and Booth that the employee's understanding of the tool designing process is different depending on if a surface or deep approach is used. With a deep approach comes a greater understanding of the task, as more aspects are discerned simultaneously. This describes how a person like Adam sees his job and also why he is regarded as experienced and responsible for teaching the other employees. A person with a surface approach could be someone who manages to execute work tasks but without understanding them completely (and might not even need to). A "cookbook design engineer who only follows recipes" as Adam called this type of approach. Thus, the qualitatively differ-

ent approaches ranges from the "cookbook design engineer" to the experienced design engineer.

Similar to how the employees approach their work tasks with either a surface or deep approach, so can also the approach towards using and contributing to a KMS be described. Looking again at the example of Adam seeing the platform having value in a bigger context, we see that he discerns aspects to using and contributing to the platform that the other employees did not. In this example he takes the external horizon of the platform into account, as he sees the use of the platform in a different context and not simply the platform solely (the internal horizon). The platform was described by him as a *forum* where users can come together and engage in discussions, highlighting the users of the platform. For him it was *one place* for where several employees could write together. Arthur on the contrast said he saw the platform as a *database*, putting the social element in the background while focusing on the platform's ability to be one place where information and knowledge can be stored and retrieved. These features of the platform, those that define a KMS, forms the internal horizon of the platform. The reasoning of having the platform as *one place* differs between the employees in terms of communication features.

In theory, the approach is related to the process of meaning-making. According to Marton and Booth the approach determines how aspects are discerned, from focusing on only the designated to the underlying meaning. As was explained in section 3.7 on page 18, meaning is derived from what is emphasized, what aspects that are discerned and focally aware. Thus, there is a strong connection between the employees' approach and how they make meaning. The certain aspects that are discerned is determined by the perspective used, which in turn is given by the habit of mind according to Mezirow, see Figure 3. Thus in the extension the approach and the meaning-making process is influenced by the habit of mind.

But what is more respectively less meaningful in using and contributing to the platform? How are the meaning-making aspects qualitatively different? As the experienced design engineer discerned the social aspect, socialization can be seen as a more meaningful aspect. For the worker with a surface approach, where work can be characterized as following step-by-step guides, the benefit of the platform lies in its features of storing, organizing, retrieving and presenting content. In the same way as knowledge is productive use of information (see Oye et al., 2011; Pasher & Ronen, 2011; Roberts, 2000), the social aspect of the platform is productive use of the platform's basic functions.

What differentiates the meaning-making aspects can be further explained using the language provided by motivational theories. It was seen that some aspects work as maintenance factors. By contributing

to the platform to keep it current, the platform becomes useful as opposed to useless, and enables other meaning-making aspects to appear. Other examples of aspects that resembles maintenance factors includes using the platform for information filtering (as opposed to information overload), having a simple interface (instead of an obtrusive) and doing it for the company because of the salary. Therefore these aspects are considered less meaning-making.

Are there any meaning-making aspects that resemble intrinsic and extrinsic motivators as these are described by Venkatesh and Speier? Intrinsic motivation in this context would refer to the inherent satisfaction derived from using and contributing to the platform. The altruism Brian showed for contributing, that he thought it could simply be fun to do, is an example of this. Why he thought it would be fun to share was described by himself that it is in human nature to teach and learn. As sharing and contributing to the platform involves several choices, which signs to use and so on, it is a design process (see Selander & Kress, 2010). When contributing to the platform, the employees becomes designers as they make different choices, this involves room for creativity.

Creativity and being creative united the respondents in what they felt best about in their jobs. Other meaning-making aspects mentioned which are similar to that of intrinsic motivation all have some connection to creativity. As the employees told it, there would be satisfaction in using the platform to discuss and devise (creating) new smart solutions together. Although less intrinsic, as it is not directly derived from a platform specific activity, even the aspect of using the platform to get more time can be related to creativity. For Adam the time the platform could earn for him was time he could spend on research and development – that is, being creative.

The significance of creativity can be broken down like this:

- Motivational theories shows creativity as significant as it is the common aspect among those that resembles intrinsic motivators and part of the highest level in Maslow's hierarchy of needs.
- The meaning-making process is a design process which involves choices, which opens up room for creativity.

Given the definition of extrinsic motivators (see section 3.2), the similar meaning-making aspects would include efficiency as it is directly related to job performance. Other aspects that falls into the extrinsic category is doing it for the company (to get the salary) and working similarly (to improve the efficiency).

Maslow's hierarchy of needs can be used to further point out which meaning-making aspects are fundamental. The platform as an information filter would relieve Bill's stress, a physiological need. On the other hand, the theme of socialization overlaps both the levels of belongingness and self-actualization as discussing new solutions is both

interaction with other employees and a challenging while creative task.

A shortcoming to the theories on motivation given in section 3.2 is that they all take an individual perspective. They try to answer what it is that the individual needs to have or do to be motivated, take for example self-efficacy and self-actualization. Using a post-modern perspective however helps us see that meaning, and therefore motivation, is something negotiated and agreed upon between social beings in a context (cp. Ahl, 2004; Kvale, 1997; Lantz, 2007). More descriptive would therefore be to talk about *social-efficacy* and *social-actualization*. Helping each other be as effective as possible could be an example of social-actualization. Social-efficacy, a shared "confidence" between the employees when facing the task of using and contributing to the platform describes how a state of deficient equilibrium could be overcomed.

Putting all things together gives a picture of meaning-making in different qualitative levels (see Fig. 8). Both Marton and Booth and Selander and Kress suggests that meaning-making and learning both derive from the ability to experience. The meaning-making aspects are therefore also *learning* aspects. Seeing it as learning aspects instead, they range from individual learning (using the platform simply as reference, a database) to collaborative learning (using its social features). If the communication between employees in different settings gives rise to reflecting over their point of views, there is also the potential for transformative learning to take place.

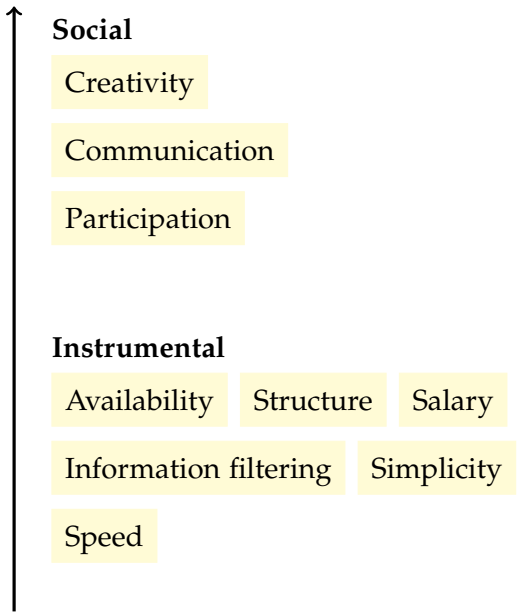

Figure 8: The meaning-making aspects in using and contributing to the platform, seen in qualitatively different levels. The aspects ranges from instrumental to social aspects. The instrumental aspects of the platform is close to that of indivdual learning while social aspects are close to that of collaborative learning.

6 CONCLUSIONS

The research question was to find what creates meaning for the employees at a design engineering department in using respectively contributing to a common knowledge management system. The results and the analysis shows that what is meaning-making for the employees goes hand in hand with how they approach their work tasks, and in extension their habits of mind. With a surface approach to the job, instrumental aspects of the platform creates meaning. A deep approach towards the job and the social aspects of the platform are the meaning-making ones in using and contributing to the platform. The highlighted aspects, from instrumental to social, are:

- Instrumental
  - Availability
  - Structure
  - Salary
  - Information filtering
  - Simplicity
  - Speed
- Social
  - Participation
  - Communication
  - Creativity

The qualitative difference between the aspects ranges from that of individual learning to that of collaborative learning.

7 DISCUSSION

In this chapter, the practical utility of the results and analysis is discussed in light of design considerations for a KMS. The methods used are reviewed and suggestions for future research is presented.

7.1 DESIGNING ICT FOR KNOWLEDGE SHARING

The purpose of this thesis is to highlight and discuss aspects to consider when designing a KMS for knowledge sharing, in this case the platform specifically. The basis for this discussion is what is meaning-making for the employees in using and contributing to the platform. It is also based on the author's personal experience with ICT. As the results and analysis shows two different categories of meaning-making aspects, instrumental and social, design considerations for the platform is also separated into these two categories.

Although the instrumental aspects are considered qualitatively less meaning-making, the features of the platform that they derive from are necessary. To provide *availability*, the platform needs a reliable back end (servers and databases) to run on. The back end also affects the speed of using and contributing to the platform, but is limited by the design of the front end, the user interface. The performance of the back end matters less if the interface doesn't provide intuitive ways of finding and accessing information. Providing a search function offers the users not only different ways of interaction but could also speed up navigation. The overall speed can also be improved by small considerations such as in-line editing, validating input fields on typing rather than when submitting the form, and loading additional content using AJAX[1] instead of loading new pages. As the purpose of the platform is to be an information filter, the structure and navigation can not go overlooked.

The structure can be either static and developed in advance or dynamic and change over time. The use of folksonomy – letting users themselves contribute meta-data, tags and taxonomy information – could less the burden of developing structure for the platform. It might even make it more social. But on the other hand, it would require more effort from each contributing employee, as they would need to provide both content, information about the content and together negotiate the structure. These mentioned features so far doesn't make it more than a database however. To enable the platform to be

1 The use of JavaScript and XML to communicate with a server without reloading the page, see e. g. http://www.w3schools.com/ajax/

more meaningful, emphasis needs to be on communication features, those that make it social.

As it was noted that participation on its own can feel meaningful, there is reason to bring forward the users and their activity within the system. As the most meaning-making aspect was that of communication, enabling users to communicate with each other synchronously as well as asynchronously could be key to unlocking creativity and making the platform feel most meaningful. Commenting content on blogs and content management systems is usually done in a linear comment section next to the content. Online forums sometimes have threaded comments, enabling discussions to diverge. Both these types of comment systems should be looked into to enable communication around the content of the platform. However, they both have in common that the comments are separated from the content. Another take would be to take inspiration from Google Documents[2], where users can write together and comment on different sections in the margin. This type of layered commenting brings the content closer to the comments, while it also enables different discussions on different aspects of the content to take place simultaneously.

Commenting features could improve content like task instructions towards the abstract best *one way* they seek to work. But if the content is not editable by anyone else than the user who contributed it, then it is up to that user to update the instructions accordingly. Making the content editable for everyone, or a selection of users, similar to that of Wikipedia would affect both efficiency and the possibilities to contribute. However as multiple users can edit content without restrictions, there will be impacts on the quality of the content. This could be for the better or the worse depending on the employees' habits of mind and how they would use the platform. The dilemma is that of either having an open platform with higher potential for contributions but with that being less accurate versus a limited platform with higher quality and accuracy but less easy to contribute to. Features like moderation, a hierarchy of users, privileges, and being able to vote on users and contributions can compensate for the disadvantages an open system brings. The results of this thesis does not tell to which degree these features needs to be considered for the platform and the employees of department A.

The content of the platform is represented using the signs and modes that the platform offers. If the platform was limited to only text input, then sharing of knowledge using the platform would be limited as well. A representation, whether it is content within the platform or a page in a notebook, reflects a persons understanding. As the employees understands their tasks at hand differently depending on if they use a surface or deep approach, sharing their knowledge using the platform requires the platform to be versatile and multi-

2 An online collaborative word editor, see http://drive.google.com

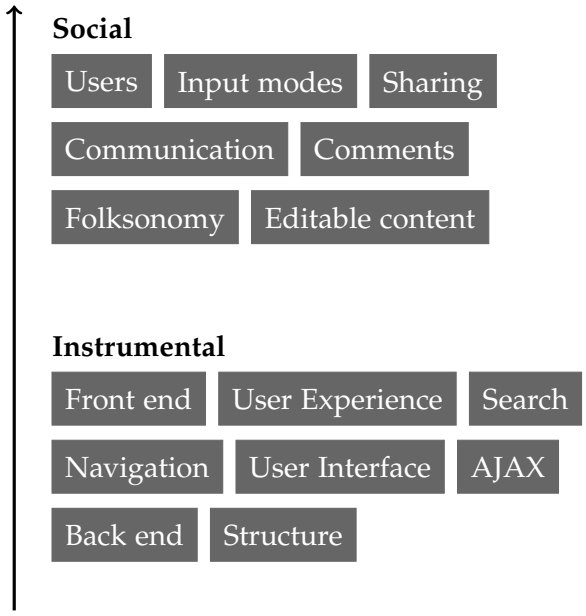

Figure 9: Features, aspects and functionality to consider when developing ICT for knowledge sharing, corresponding to the meaning-making aspects in Figure 8.

modal. In concrete terms, the user should be able contribute both text with formatting and visuals such as images and video. Following the discussion above on commenting systems, providing annotations could let the user differentiate the content in data and meta-data. One example of how video could be used is screencasts[3]. One employee could record and comment the CAD software during a difficult tool designing process and then have the video saved to the platform for other employees to take part of. By offering collaborative possibilities and interactivity, even more modes can be used. In terms of sharing knowledge, the platform has the potential of offering modes alternatives without ICT can not. Additional modes could very well also spark the employees' creativity as they share their user-generated content. The design considerations is summarized in Figure 9.

7.2 CRITICISM OF METHODS

The workflow of this thesis has been similar to that of editing a Wikipedia article, in opposite to writing the thesis from start to finish. With help from post-it notes and large sheets of paper, each section of the thesis was planned out early on and changed as each part of the whole changed. This was done to increase the validity of the research. For example, as the interview questions was about what they felt was *meaningful*, the research questions was updated to better match what

3 Recording the computer screen and microphone input, e. g. http://www.screencast-o-matic.com/

was asked than using the more complicated term of meaning-making. Overall transparency towards the reader – detailing each step taken – has been used to ensure validity and reliability.

The transcriptions could have been more verbatim, but the qualitative gain in doing so would likely not have been reflected in the thesis' results.

The thesis takes a trade-off between reliability and confidentiality. Because of sensitive information, the transcriptions was read only by the author of this thesis. Therefore it is unknown whether more researchers reading the transcriptions would provide more consistent data. Being present at department A and getting to know the employees and the situation before interviewing did on the other hand create a relaxed setting for the interviews, and with that reliable responses. On the other hand, the initiator of the platform had both a close connection to the employees and around a year to sell in the benefits of the platform. This and the novelty factor of the platform could very well have affected the respondents. Therefore it was emphasized during the interviews that their personal thoughts and their confidentiality was top priority.

The reliability might have improved if all five employees of department A took part in the study. However as one joined the team during the time frame of this thesis and the other was too involved in the development of the platform, the validity of the study would have been significantly affected.

Some of the reasons mentioned by Vuori and Okkonen (2012) for using and contributing to a KMS (see section 3.6 on page 16) overlaps this thesis' conclusions. The overlapping reasons are: because it feels useful, contributing to the organization's success and reciprocity. Thus, there are recurring patterns in this field of research and parts of the conclusions of this thesis are generalizable. Looking at these reasons, it is also seen that this study has gone beyond and more in depth than being content with a reason such as "it feels useful to". The conclusions points towards the difference between what makes the platform feel *useful* and what makes it feel *meaningful*.

The biggest drawback to the methods used is that by concentrating and making the employees' thoughts and responses more abstract, qualitative aspects are lost along the way. The dilemma became that of choosing the right balance between getting a manageable overview and fairly reproduce the employees' opinions and thoughts. Even when translating the interviews from Swedish to English, some aspects may have been lost in translation.

7.3 FUTURE RESEARCH

This thesis aimed to reach new ground in the research area of knowledge sharing and knowledge management systems, with the use of

qualitative methods. A suggestion for future research would therefore be to study if the conclusions stated holds up in a larger scale. Quantitative methods and online questionnaires could be used to verify the model in Figure 8.

It was concluded that a more experienced worker, the one with a deep approach towards tasks, saw social aspects of the platform as more meaning-making. In section 7.1 on page 43 it was discussed which features of a KMS that corresponds to those social meaning-making aspects, namely communicative and social features. If the development of the platform prioritized these features, could it possibly change how other employees sees work tasks? Future research could seek if the thesis' conclusions are "reversible", if a virtuous spiral can be created for the organization beginning with a KMS and then continuing with change in the employees' habits of mind.

A

INTERVIEW GUIDE - DEPARTMENT A

The following is the Swedish original interview guide, with employees of department A.

FORMALIA:

- *Syfte:* Förstå vad som skapar mening för de anställda i att använda sig av och bidra till en gemensam webb-baserad kunskapsdatabas.
- Jag gör en undersökning kring plattformar/verktyg liknande den som utvecklas här/exjobbet kretsar kring.
- Min utgångspunkt är att jag intresserar mig för hur du som anställd här tänker kring detta.
- Dokumenteras med inspelning. Endast för personlig användning. Du förblir anonym.
- Din medverkan är frivillig. Vill du inte svara... Avbryt när du vill...
- Ca 45 min. Frågor?

INLEDNING:

- Ålder? Kort bakgrund? Vad för slags IT-person är du? Wikipedia? Facebook?
- Roll? Ansvarsområden? Tid i företaget? Hur ser en arbetsdag ut för dig?
- Vad är det bästa med jobbet? Vad är det sämsta med jobbet?

ANVÄNDNING AV PLATTFORMEN

- Vad kallar du det för något? Vad är det för något? Tankar kring detta?
- Hur tar du del av information du behöver idag?
- Har du använt dig av plattformen? Vilken betydelse har plattformen för dig i ditt arbete? Vad är viktigt för dig?

- Vad skiljer sig åt i din arbetsdag från tidigare innan plattformen?
- Ett av syftena med plattformen är att dra ner på tid som försvinner då kollegor ber varandra om hjälp. Vad tänker du när du hör detta? Något mer att tillägga?

BIDRAGANDE TILL PLATTFORMEN

- Idag pratas det mycket om vikten av informationsutbyte och kunskapsdelning. Vad tänker du om det?
- Hur delar du information idag? Har du bidragit till plattformen? Tankar om det? Förväntningar på bidra?
- Upplever du det som meningsfullt? Varför/varför inte?
- Vad skulle kunna få dig att tycka att det är (mer) meningsfullt att bidra till plattformen?
- Att det är ett webb-baserat verktyg, ökar det ditt intresse för att vilja bidra?

AVSLUTANDE

- Har du några erfarenheter av liknande system? Använde du dessa? Hur? Varför? Berätta? Bidrog du?
- Vilka fördelar/nackdelar ser du med att använda och bidra till denna plattform?
- Vad har du för förväntningar?

B

INTERVIEW GUIDE - DEPARTMENT B

The following is the Swedish original interview guide, with employees of department B.

FORMALIA:

- *Syfte:* Förstå vad som skapar mening för de anställda i att använda sig av och bidra till en gemensam webb-baserad kunskapsdatabas.
- Jag gör en undersökning kring plattformar/verktyg liknande den som utvecklas här/exjobbet kretsar kring.
- Min utgångspunkt är att jag intresserar mig för hur du som anställd här tänker kring detta.
- Dokumenteras med inspelning. Endast för personlig användning. Du förblir anonym.
- Din medverkan är frivillig. Vill du inte svara... Avbryt när du vill...
- Ca 45 min. Frågor?

INLEDNING:

- Ålder? Kort bakgrund? Vad för slags IT-person är du? Wikipedia? Facebook?
- Roll? Ansvarsområden? Tid i företaget? Hur ser en arbetsdag ut för dig?
- Vad är det bästa med jobbet? Vad är det sämsta med jobbet?

ANVÄNDNING AV PLATTFORMEN

- Känner du till plattformen? Vad kallar du det för något? Vad är det för något? Tankar kring detta?
- Hur tar du del av information du behöver idag?
- Har du använt dig av plattformen? Vilken betydelse har plattformen för dig i ditt arbete? Vad är viktigt för dig?
- Kan du se att du får användning för denna plattform? Hurdå?

- Ett av syftena med plattformen är att dra ner på tid som försvinner då kollegor ber varandra om hjälp. Vad tänker du när du hör detta? Något mer att tillägga?

BIDRAGANDE TILL PLATTFORMEN

- Idag pratas det mycket om vikten av informationsutbyte och kunskapsdelning. Vad tänker du om det?
- Hur delar du information idag? Kan du se dig själv bidra till plattformen? Tankar om det? Förväntningar på bidra?
- Upplever du det som meningsfullt? Varför/varför inte?
- Vad skulle kunna få dig att tycka att det är (mer) meningsfullt att bidra till plattformen?
- Att det är ett webb-baserat verktyg, ökar det ditt intresse för att vilja bidra?

AVSLUTANDE

- Har du några erfarenheter av liknande system? Använde du dessa? Hur? Varför? Berätta? Bidrog du?
- Vilka fördelar/nackdelar ser du med att använda och bidra till denna plattform?
- Vad har du för förväntningar?

C

INTERVIEW GUIDE - OTHER PROJECTS

The following is the Swedish original interview guide, for initiators of similar projects within Sandvik, which was used in one phone interview.

- Målsättning?
- Förutsättningar?
- Hur utvärderades?
  - Idé bakom utseende?
- Hur involverades användare?
  - Hur sålts in? Hur gick det? Varför lyckat/misslyckat?
- Vad gjort annorlunda med facit i hand?
- Allmänna tips?
  - Viktigaste erfarenheten för...
- Vilka tidigare studier/teorier/erfarenheter har ni lutat er mot?
- Hur få uniformt språk och struktur?
- Konceptet - hur användargenererad?

D

ANALYSIS GUIDE

MAIN METHODS – AD-HOC

- Chain-of-reasoning
  - In light of: expectations / wishes / past experiences
  - Group answers by motivators
- Theoretical framework

ANALYZING THE TRANSCRIPTIONS, WHAT TO LOOK FOR

- Similarities – dissimilarities – nuances
- Structure/patterns individually and between respondents
- Consistency in replies
- Comprehensive, differentiated and nuanced?
- Spontaneous stories?
- Any metaphors used?
- Actions and choices referred to
- Signs and representations used

INTERPRETING THE DATA

- Apply theories / Re-contextualize / "use glasses"
- Intuitive/explorative interpretations
- Meaning-making
- Concentration
  - Make abstract
  - Summarizing words/symbols
  - Codify without loss of meaning
  - Create central themes
  - ""What does these central themes say about what is meaning-making in. . . ?"

  - Tie together central non overflowing themes in a descriptive saga

- Hidden contexts/certainties
- Parts and whole
  - Does the parts tell more about the whole?
  - Why are the parts connected as they are?
- How can the phenomena be understood?
- Focus on what make they act
- Psychoanalytical - relationships between the employees

MISCELLANEOUS

- What do they *not* say?
- Do they say what I want to hear?
- Problematize the respondents' inner reference system
- Avoid making quantitative conclusions
- Convince with arguments

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