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# Facilitating Activities for Knowledge Management Success in Project Based Organizations

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## Table of Contents

Table of Contents.....	1
Table of Figures.....	4
Introduction.....	5
The Case Company.....	6
Research Question.....	6
Theory.....	7
Definitions.....	7
Project.....	7
Project Management.....	7
Knowledge.....	7
Knowledge Management.....	8
Systematization and Classification of Knowledge Management.....	10
Classification by Organizational Levels.....	10
Micro/Macro Classification.....	10
Boh's Two-Scale Classification.....	13
Knowledge Management in Practice.....	16
Codification in Practice.....	16
What and When to Record.....	17
Barriers to Effective Knowledge Management.....	18
Facilitating Activities.....	19
Summary.....	21
Methodology Theory.....	22
Case Study Methodology.....	22
The Front Phase: Choosing the Right Method.....	23
Quantitative and Qualitative Research.....	24
Research Design.....	25
Prepare.....	30
Collect.....	31
Analyze.....	33
Share.....	36
Research Results.....	37

Current State in the Company .....	37
Operational Routines .....	37
IT System.....	37
Strategic Initiatives.....	37
Quantitative Data.....	39
Sample .....	39
Results.....	40
Qualitative Data.....	48
Results.....	48
Analysis and Discussion .....	49
Strategy.....	49
Organizational Culture.....	50
Formal Systems .....	51
Awareness and Effectiveness .....	51
IT System.....	52
Faveo Academy.....	54
Operational Routines .....	54
Training .....	55
Management Support.....	56
Time and Opportunity Cost.....	57
Motivation.....	58
Reward System.....	58
Feedback.....	59
Communication .....	60
Temporary Organization of Projects .....	61
Individual Survival-Instinct .....	62
Conclusion .....	63
Organizational Culture.....	64
Formal Systems .....	64
Management Support.....	64
Time and Opportunity Cost.....	65
Motivation.....	65
Communication .....	66

Temporary Organization of Projects .....	66
Individual Survival Instinct .....	66
Conclusion and Implications .....	66
Recommendations for the Case Company .....	68
Strategy .....	68
Organizational Culture .....	69
Formal Systems .....	69
IT System.....	70
Faveo Academy .....	71
Operational Routines .....	72
Training .....	72
Management Support and Time and Opportunity Cost .....	72
Motivation .....	73
Reward system .....	73
Feedback .....	73
Communication .....	74
Temporary Organization of Projects .....	74
Individual Survival-Instinct .....	75
Limitations.....	76
Further Research .....	76
References .....	77
Appendix 1: Case study protocol.....	82
Preamble.....	82
General .....	82
Procedures.....	83
Research instruments.....	84
The Questionnaire .....	84
Interview .....	88
Data analysis guidelines .....	92
Appendix 2: Interview Results .....	94

## Table of Figures

Figure 1: Framework of knowledge governance in PBOs by Pemsel et.al, adapted from Coleman (1990), Foss (2007) and Foss et al. (2010). .....	11
Figure 2: Project Knowledge sharing - Contribution to project .....	12
Figure 3: Case Study Procedure (Yin, 2009) .....	22
Figure 4: Case Study Designs (Yin, 2009) .....	28
Figure 5: Unit of Analysis .....	29
Figure 6: Quantitative Analysis: Knowledge Management Strategy.....	49
Figure 7: Quantitative Analysis: Organizational Culture.....	50
Figure 8: Quantitative Analysis: Defined Process.....	51
Figure 9: Quantitative Analysis: Effectiveness of the System .....	51
Figure 10: Quantitative Analysis: Benefits of Finding Lessons .....	53
Figure 11: Quantitative Analysis: Knowledge Manager .....	54
Figure 12: Quantitative Analysis: After Action Review .....	55
Figure 13: Quantitative Analysis: Knowledge Audit .....	55
Figure 14: Quantitative Analysis: Reward System.....	58
Figure 15: Quantitative Analysis: Motivation.....	58
Figure 16: Quantitative Analysis: Communication .....	60
Figure 17: Quantitative Analysis: Individual Survival Instinct .....	62

## Introduction

According to the Standish Group's Chaos Report for 2009, only 32% of all surveyed projects are considered to be successful and are delivered on time, budget and with the required features and functions (Yeong, 2010). This clearly shows the importance of proper management of projects, and the need to improve current project management practices. Many have done research on this subject and how to do this. Among others did Zwikael & Unger-Aviram (2009) a study on the correlation between team development practices and project success, but found no significant impact of team development practices on project success. Others have tried finding leadership profiles in successful project leaders (Muller & Turner, 2009) with varying results.

The Japanese project management standard recognizes knowledge and experience as the main sources of project value (Project Management Association of Japan, 2005). Nonaka (1991) argues that successful companies are those that consistently create new knowledge, circulate knowledge within the organization and deploy the knowledge into new products rapidly (Yeong, 2010). Executive Edge magazine (1998) further identified knowledge management as the cutting edge priority for organizational development and explained:

“Knowledge Management [...] is a process that harvests and shares an organization's collective knowledge to achieve breakthrough results in productivity and innovation. In contrast, Information Management merely collects, processes, and condenses information. Knowledge Management is a collaborative management discipline that aims to make employees smarter, more innovative and better decision makers”.

More than a decade later, many companies still talk of knowledge management in a way that better describes the aforementioned information management, thinking of knowledge management only as a way to capture and spread explicit information, ignoring the valuable tacit information inherent in the organization.

In a previous study, we researched the connections between knowledge management activities and project success, and found especially the use of pre-designed templates, informal sharing of documents, after-action reviews, mentoring and having a dedicated knowledge manager to positively impact project success (Amdam & Mækelæ, 2013). To further this research, we will in this thesis explore whether the presence of facilitating activities and preconditions might have an impact on knowledge management success.

Our main focus will lie on knowledge management in project-based organizations (PBOs). The term PBO includes firms that acknowledge project work and carry out most of their activities in projects, as well as organizations that use projects as a strategic means for differentiation. PBOs are challenging business models for developing a KM framework. While their structure facilitates knowledge creation, they can hinder knowledge retention and sharing without adequate routines and governance mechanisms. (Pemsel et al, 2014)

In this report, we will first present some definitions of the most important concepts. We will then look at some theoretical classifications of knowledge management along with the basic theory

used in our analysis, including knowledge management in practice, barriers to knowledge management and facilitating activities to counter these. We will then go through the methodology theory used in the analysis while describing the research process. Further, we will present our quantitative and qualitative research results and follow up with analysis and discussion around the findings. We will then present our theoretical conclusion with implications from the research and recommendations for the case company. Finally, we will present the limitations regarding this study and suggestions for further research.

## The Case Company

The case company, Faveo Prosjektledelse, is a medium size consultancy firm with roughly 320 employees and is one of the leading companies within the field of project management consulting in the Norwegian context. Based in two Scandinavian countries, dispersed among thirteen different offices they offer consultancy within the fields of project management, project development and project control. They offer their services to a broad range of industries like construction, transportation, and energy.

## Research Question

### Theme

Facilitating activities for knowledge management success in project based organizations.

### Research Question

How does the theoretical connection between facilitating activities and knowledge management success match observed conditions in the case company.

### Proposition

Facilitating activities counteract barriers to successful knowledge management in project based organizations.



## Theory

In this chapter we will first present some definitions to the most important concepts used in the thesis. We will then look at some theoretical classifications of knowledge management as well as some practical approaches to knowledge management, including how, what and when to record and utilize knowledge, barriers to knowledge management and facilitating activities to counter these.

## Definitions

### Project

The Project Management Institute (PMI) is a prominent actor in the research and training of professionals in the United States but it also has a significant global presence. The Institute's Project Management Body of Knowledge guide (PMBOK) defines a project as being "a temporary endeavor undertaken to create a unique product, service, or result". A project can create a product that can be either a component of another item or an end item in itself (PMI 2008).

### Project Management

According to the PMBOK, the increase in project management indicates that the application of appropriate knowledge, process, skills, tools, and techniques can have a significant impact on project success. The main objective of project management is to ensure that a project is completed at the required scope, within budget, on time and delivers a quality product or service as the end result. PMI thus defines project management as "the application of knowledge, skills, tools, and techniques to project activities to meet the project requirement" (PMI 2008; Yeong, 2010)

In addition to the operational aspects of project completion, we have chosen to encompass the responsibility of organizational learning in the PBO within the project management sphere.

### Knowledge

The term knowledge originates from Middle English (originally as a verb in the sense 'acknowledge, recognize', later as a noun) and has later been given many definitions. Stair and Reynolds (1998) states that "Knowledge is the awareness and understanding of a set of information and ways that information can be made useful to support a specific task or reach a decision". It can be implicit (as with practical skill or expertise) or explicit (as with the theoretical understanding of a subject); it can be more or less formal or systematic (Wikipedia, 2013). We can even find definitions in expressions of Christianity, such as Catholicism and Anglicanism, where knowledge is one of the seven gifts of the Holy Spirit (Scborromeo.org, 2013).

Further, a very common definition is contained within the DIKW (Data - Information - Knowledge - Wisdom) pyramid. The DIKW Pyramid refers loosely to a class of models (Zins, 2007) for representing relationships between data, information, knowledge, and wisdom. In this sense knowledge is often defined as the mental world map we have (tacit), and thus cannot be shared without first being reduced to information.

Another similar approach is made by Davenport et al. (1998) where he states:

“Knowledge is a fluid mix of framed experience, values, contextual information and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices and norms.”

In contrast to Zins, he here allows for the term knowledge being something organizations as a whole possess outside the minds of employees. We prefer the definition of Zins, because of the fact that if you were to change all members of an organization, this “organizational knowledge” would be lost and new employees would have to form new knowledge based on information provided by the previous members – enforcing the idea that knowledge is something residing in the heads of people. These definitions however will have little or no impact on our further study.

For all purposes, we have chosen the Oxford English dictionary, which defines knowledge as “facts, information, and skills acquired through experience or education; the theoretical or practical understanding of a subject; awareness or familiarity gained by experience of a fact or situation” (Oxford Dictionaries, 2013).

## Knowledge Management

The area of knowledge management developed in parallel to other areas in project management, like risk management, quality management and communications management, but have never been as systematized as those areas (Gasik, 2011). Historically, the first approach was the cognitive view of project knowledge, called “first generation knowledge management” (Basil & Calderia, 1995; Boddie, 1987). Here knowledge was seen as a resource that may be stored on external media. The “second generation knowledge management” emerged later on (Swan et al., 1999; Jackson & Klobas, 2008) and considered the concept of communities of practice and social interactions as engines for knowledge creation and sharing.

Many authors have explored the concept of knowledge management and attempted to define the subject:

- Knowledge management is a process of systematically and actively *identifying, activating, replicating, storing and transferring* knowledge (Probst, Raub & Romhard, 2003).
- The process of knowledge management includes knowledge *identification, creation, acquisition, transfer, sharing and exploitation* (Abdul Rahman, Yahya, Beravi & Wah, 2008).
- Knowledge management is a method of controlling processes of knowledge creation, its *codification, ordering, storing, retrieval, processing, transfer and application* (Jemielniak & Kozminski, 2008)

Others again have a more holistic approach, and focuses on the benefits to the organization:

- Knowledge management is about *harnessing the intellectual and social capital* of individuals in order to *improve organizational learning capabilities* (Swan et. al., 1999).
- Knowledge management is a *disciplined, holistic approach to using expertise effectively for competitive advantage* (Arkell, 2007).
- The challenge of knowledge management is how to *generate and leverage collective knowledge* in the firm to *create value* that leads to *competitive advantage* (Zhang, 2007).
- Knowledge management is a systematic approach to *managing and leveraging an organization's knowledge assets*, which may include knowledge of the organization's *customers, products, market, processes, finances, and personal services* (Cope, Cope, & Hotard, 2006).

(Italics added).

Most researchers however agree that the main components of knowledge management include the dimensions of organizational culture, processes and technology (Lee & Hong 2002; Chung et al. 2001), and should be treated as a resource in terms of what the organization knows about customers, products and processes (Bollinger & Smith 2001).

As we will go further into in the following chapter, we believe in a holistic view of knowledge management: Incorporating strategy and culture, as well as both formal and informal systems designed to promote knowledge retention, sharing and use to leverage the organization's knowledge assets.

## Systematization and Classification of Knowledge Management

In this chapter we will first discuss different systematization and classifications of the knowledge management process itself and different methods of knowledge sharing. We will further review knowledge management in practice, including common barriers to- and facilitating activities for successful knowledge management.

### Classification by Organizational Levels

When talking about organizational learning there are many terms and concepts being used interchangeably, like lessons learned, knowledge sharing, knowledge management, etc. Pemsel et al. (2014) attempts through a literature study to conceptualize and define knowledge systems into three: Organizational learning, Knowledge management and Knowledge governance. In their opinion they are all closely related, but with different scopes:

*Organizational learning (OL)* has a focus on individuals, and is the process of improving employees' and organizations' outcome by creating environments that help in gaining knowledge in a specific area and use that knowledge to improve actions.

*Knowledge management (KM)* focuses on the management of knowledge. A process to enable identification, sharing, application and creation of knowledge within the organization.

*Knowledge Governance (KG)* focuses on the organizational capabilities to improve knowledge processes through the application of suitable mechanisms.

While such a division may have its applications while discussing the subjects academically to understand the different levels of the process, we do not believe it serves any purpose when researching knowledge systems as a whole. We see it as a holistic process, where the facilitating processes and mechanisms on an organizational level is necessary for the knowledge management processes of identification to sharing and finally application on an individual level to happen. All levels interact and are necessary for either to work. Because of this, when we are talking about knowledge management, consider the entire scope from organizational processes to individual instruction manuals.

### Micro/Macro Classification

Another way of dividing the different knowledge management aspects is the micro/macro approach.

**Micro-knowledge** describes processes performed in projects on knowledge needed to perform a single activity or needed for solving a single problem. A record of price list, the name of a person who may perform some task, or the way of fixing software bugs of particular types are examples of such knowledge (Gasik, 2011).

**Macro-knowledge** is the other project knowledge management processes, performed at the level of the organization that carries out the projects. Gasik (2011) define four sub-levels of project macro-knowledge:

- Individual macro-knowledge (knowledge possessed by one team member)
- Project team macro-knowledge (knowledge possessed by the project team)
- Organizational macro-knowledge (knowledge possessed by the organization)
- Global macro-knowledge (knowledge possessed by the whole global community of project managers, for example the PMBOK<sup>1</sup> by the Project Management Institute)

Foss (2007), Foss et al. (2010) and Coleman (1990) provided a two-level (macro- and micro-level) framework for knowledge processes within organizations (Pemsel et al., 2014).

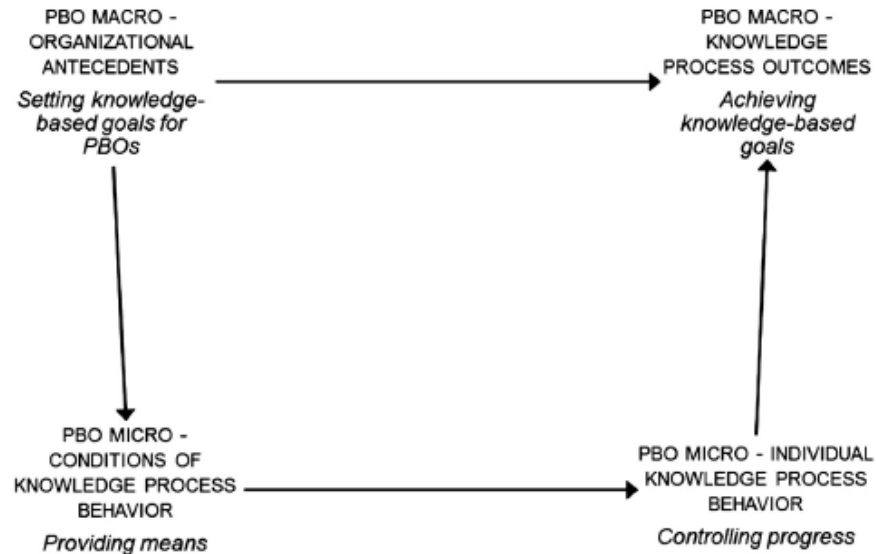


Figure 1: Framework of knowledge governance in PBOs by Pemsel et.al, adapted from Coleman (1990), Foss (2007) and Foss et al. (2010).

This framework describes how *macro-organizational antecedents* (i.e. organizational control, integrative roles, leadership, organizational structure, reward systems, organizational culture, and institutional context) set the conditions for *micro-conditions of behavior* (i.e. beliefs, interests, attitudes, values, knowledge preferences, expectations). The Micro conditions in turn impact *individual micro behaviors* and actions in the knowledge processes (i.e. learning-by-doing, learning-before-doing, observing, interacting, discussing, and recombining knowledge with others). These individual behaviors, as well as the macro-organizational antecedents impact the achievement of *macro knowledge-based goals and outcomes* (i.e. capabilities, dynamic capabilities, absorptive capacity and communities of practices).

Pemsel et al. (2014), describes how PMOs with proactive approaches to knowledge and learning *provide mechanisms* that allow for active knowledge search (Pemsel and Wiewiora, 2013). This is likely to *influence the willingness* (i.e. attitudes) of project managers to engage in knowledge related activities. In consequence, this may *impact knowledge behaviors* and communication patterns *among individuals* and project teams, which in the longer term *impact the PBOs' ability to build organizational capabilities* and communities of practice.

<sup>1</sup> Project Management Body of Knowledge  
<http://www.pmi.org/PMBOK-Guide-and-Standards.aspx>

Project knowledge management comprises processes that aim to generate, utilize, and distribute the micro-knowledge necessary for project execution, as well as processes regarding macro-knowledge on all organizational levels with the aim to increase the capabilities effective project execution or to increase people's possibilities for influencing project execution. Organizations and projects will profit from project knowledge management only when they will be able to effectively implement such a process. (Gasik, 2011).

Similarly, Ismail et al. (2009) proposed a theoretical framework as represented in Figure 2, indicating that providing appropriate motivators and removing relevant inhibitors to sharing knowledge and experience would result in more efficient and effective sharing of knowledge in projects which, in turn, would lead to an increased probability of project success.

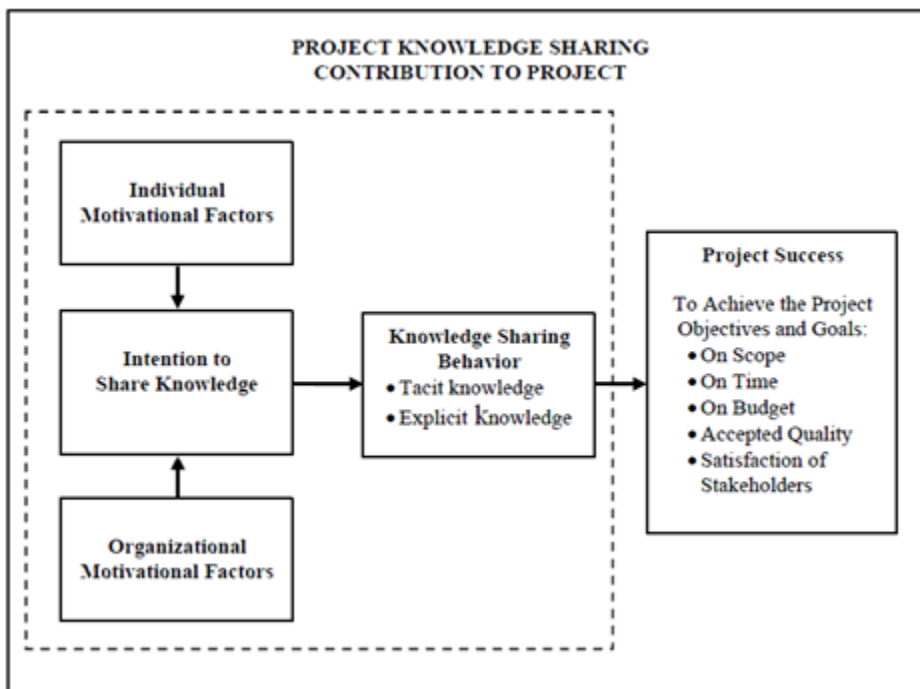


Figure 2: Project Knowledge sharing - Contribution to project

Their theoretical model suggests that there are significant relationships between effective project knowledge sharing practice and project success. The model is based on Nonaka's Knowledge Conversion Model, known as the SECI model, (Yeong, 2010) and focuses on the socialization of tacit knowledge. The authors concluded that ensuring when and how tacit and explicit knowledge is shared is essential for enhancing project success (Ismail et al., 2009; Yeong, 2010).

We believe the holistic approach, as presented by Pemsel et al. (2014) and Gasik (2011) presents a good view on the workings of knowledge. Because of this idea that a holistic approach is needed when studying knowledge management, we will not make a division and focus on specific organizational levels.

## Boh's Two-Scale Classification

When looking at more specific measures for sharing knowledge, Boh (2007) did a literature study on the classifications of different types of knowledge transfer. He made an, in our opinion, very accurate description of the different views, and further proposed a model for classification of knowledge sharing, by dividing it along two scales: Personalization vs. codification and individualized vs. institutionalized.

### *Personalization vs. Codification*

Knowledge shared through a *personalization* mechanism, is often closely tied to the person who developed it and shared mainly through direct person-to-person contact. This has the advantage of allowing the knowledge to be adapted to the specific situation. It also has the inherent flexibility of transmitting tacit knowledge - allowing for discussions and sharing interpretations that may lead to the development of new knowledge. Personalization mechanisms are often assumed to be ad hoc and informal. Personalization mechanisms are usually suitable for organizations performing very unique tasks. (Prencipe & Tell, 2001; Boh, 2007)

Knowledge shared through *codification* mechanisms is stored in databases and documents accessible to members of the organization. Codification mechanisms are often formal and embedded in the organizations routines. While codification may be an efficient strategy for transmitting a large amount of information, it does not allow interactions and customization of solutions to the knowledge seeker's problems. Codification mechanisms are usually suitable for organizations performing standardized and routine tasks. (Boh, 2007)

### *Individual vs. Institutionalized*

Knowledge sharing on the *individual* level is often unstructured and informal. It's based on individual ad hoc decisions, and encourages a free flow of information when the need arises. This increases the responsiveness and flexibility of the organization, but is reliant on whether employees happen to speak to the right person at the right time. This problem is enhanced when the organization increases in size. Individualized mechanisms are often suitable for small, collocated organizations. (Boh, 2007)

Knowledge sharing at the *institutionalized* level is often formal and embedded in organizational routines. It enables the transfer of knowledge from an individual to a large number of individuals, and enables the organization to "push" out information, rather than rely on employees to "pull" it themselves. Knowledge is then easily accessible to those who need it, but require the organization to invest time and resources in supporting infrastructure, systems, routines, rules and procedures. Institutionalized mechanisms are often suitable for large, geographically dispersed organizations. (Boh, 2007)



### Combining the Two Dimensions

	<b>Individualized</b>	<b>Institutionalized</b>
<b>Personalization</b>	Individualized-Personalization mechanisms Suitable for: Unique tasks in small organizations	Institutionalized-Personalization mechanisms Suitable for: Unique tasks in large organizations
<b>Codification</b>	Individualized-Codification mechanisms Suitable for: Routine tasks in small organizations	Institutionalized-Codification mechanisms Suitable for: Routine tasks in large organizations

#### Individualized-Personalization Mechanisms

Individualized-personalization mechanisms create opportunities for individuals to share knowledge at the individual level in an ad hoc and informal manner. Informal person-to-person interactions often play a significant role in transferring knowledge, but are dependent on people knowing 'who knows what' in the organization. (Boh, 2007)

Common mechanisms:

- Word of mouth sharing through senior staff
- Personal networks
- Storytelling within the organization
- Collaboration tools
  - Email
  - Instant Messaging

#### Individualized-Codification Mechanisms

Individualized-codification mechanisms support informal and ad hoc sharing of documents and other project artifacts like project proposals, project plans, client presentations, client reports, and lessons learned on an individual level. These facilitate the reuse of intellectual capital from earlier projects, allowing the organization to invest in making improvements to the existing intellectual capital instead of wasting effort on reinventing the wheel.

A common obstacle with this type of sharing is that documentation often is stored on the hard disks of individual team members or shared spaces accessible only to the team members, and thus is unavailable to others. Even when a centralized database is available, individuals sometimes need to ask the right person to locate the relevant documents if the categorization and search facilities are not sufficiently refined. (Owen et. al., 2004; Boh, 2007)

Common mechanisms:

- Sharing prior project documents informally
- Manuals written voluntarily



### Institutionalized-Codification Mechanisms

Institutionalized-codification mechanisms are institutionalized in the routines and structure of the organization and capture specialist knowledge in knowledge bases where others can access it, making it the wider property of the organization. These mechanisms are conventionally included in knowledge management programs, especially those that emphasize the use of information technology. (Boh, 2007)

Common mechanisms:

- Databases
- Use of templates
- Broadcast emails and forums
- Expertise directory/Knowledge database
- Standardized methodology

### Institutionalized-Personalization Mechanisms

Institutionalized-personalization mechanisms are personalization mechanisms institutionalized in the routines and structure of the organization. Individuals play an integral role in the learning and knowledge-sharing processes of organizations and direct interactions between two individuals offer many advantages over codifying the knowledge, since people have the ability to restructure knowledge across different tasks.

Common mechanisms:

- Mentoring Programs
- Meetings Among High Level Staff
- Project Reviews/After-Action Reviews
- Having a Common Project Director Shared Across Projects
- Cross-Staffing Across Projects
- Communities of Practice
- Support Centers
- Performing a Knowledge Audit
- Yellow Pages: A Searchable Database of Who Knows What

While we won't focus our research on any one specific method of knowledge sharing, we believe this framework provides a useful classification of the different knowledge management activities, and under which circumstances they could be utilized.

## Knowledge Management in Practice

Although many project management communities are aware of the fact that they are lacking in knowledge management and lessons learned, they rarely know why or what they can do about it. Leaders may develop strategies for knowledge management and provide the employees with sufficient resources needed. They however can't control to what degree employees are following the strategies provided. What they can do is to encourage the employees to follow the appointed strategies or encourage them to self-organize how they should work with knowledge management. The latter is the most common approach (Alvesson et al., 2004).

Small organizations practice knowledge management different than large ones. This is due to the characteristics and limitations of the small organizations (Kulkarni, 2009). Large organizations are able to dedicate resources for knowledge management, while the smaller ones often don't have the same economic potential. It thus becomes more important how they are managing the knowledge within the organization (Albino et al., 2009). Smaller organizations however invest a lot more than previously known, but in a different way of training. Smaller companies often follow an on-the-job developing of their competence, which means a more informal way of learning, like work-related training in projects, learning from others on the job and interaction with external competencies. Generalization of smaller businesses is often difficult since they tend to have an entrepreneurial spirit and live by the rules of "do not waste resources on something you do not know is going to help you" (Ylinenpaa, 2005). This is in accordance to the findings of Boh (2007), stating that personalization mechanisms are the most suitable ones for smaller organizations.

## Codification in Practice

Newell et al. (2004) examined cross-project learning in IT projects, and found that ICT had not been a very effective measure for knowledge sharing. However, knowledge shared through social networks had been successfully used to a higher degree. This might suggest, as many are experiencing, that the implementation of knowledge databases often don't have the desired effect. The reason for this isn't necessarily that codification is a poor method of capturing and sharing knowledge. It might just be due to the lack of proper facilitating activities, like maintenance required to make the system work and the fact that these activities are often overlooked or gradually forgotten. This last point was also reproduced in a research by Pilsmo (2010), where several case companies reported having had a working system for storing and spreading newly acquired knowledge through education. The system had however been gradually forgotten and was no longer in use. This was also found by Rhodes and Dawson (2013). In the studied organization, the greatest barrier when implementing a tool was that no individual or group took responsibility for the product, and thus it was eventually neglected.

A common concern regarding this kind of activity which is not directly value driven, is that it's seen as "another administrative process that needs to be done", and thus will not be given the proper attention and quality of work. However, Pilsmo (2010) found with his interviewees that this was not the case. They were positive to the process, but felt they missed a proper, fixed structure of doing it. This again highlights the importance of a unified, fixed system and proper routines in managing knowledge.

Lilly and Porter (2003) found that if an organization is going to use a database, it is important that the lessons learned are easily retrievable, in order to facilitate actual later use of the database and the lessons recorded. Further Milton (2011) specifies that when a lesson is written, it needs to be clear, quantified and written as a recommendation. He argues that a lesson is not learned until something changes as a result. This is also reflected in NATO's Lessons Learned Handbook (2011), stating that recorded lessons are only 'identified lessons', and that they are not considered learned until a project has applied these identified lessons. These definitions highlight the importance of not only capturing knowledge in the organization, but also sharing it in an effective manner enabling later utilization of the knowledge. Only then is the organization actually learning (Rhodes & Dawson, 2013).

### What and When to Record

Knowledge is created throughout the project lifecycle at both explicit and tacit levels. Explicit knowledge is captured in terms of project documentation during the project lifecycle. Tacit knowledge is captured at the project level in the form of personal knowledge contributed by the project team members. This can be done by activities like after-action reviews or knowledge audits in the organization.

Milton (2005) identifies three different stages of project knowledge management:

1. Learning at the *start*: You gather knowledge from previously recorded lessons, enabling you to begin the project in a state of complete knowledge.
2. Learning *during* the project: Gathering and distributing knowledge during project execution allows you to change the plans and create new ones based on newfound knowledge.
3. Learning at the *end*: Here's the part most people think of when confronted with knowledge management questions. At the end of the project you gather all knowledge accumulated during the project and enable future use.

Whether explicitly stored information, or direct transfer of tacit knowledge, Becerra-Fernandez and Sabherwal (2010) make three important clarifications. First, knowledge sharing means effective transfer, so that the recipient of knowledge can understand it well enough to act on it. Second, what is shared is knowledge instead of just situational recommendations based on the knowledge. Third, knowledge sharing may take place across individuals as well as across groups, departments, or organizations.

While a key aspect of successful learning is an organizational willingness to admit when things go wrong and be able to discuss errors (Rhodes & Dawson, 2013), it is also an important point to record and distribute successes as well as mistakes. This in order to both learn from and continue good practices, but also as a measure to increase morale (Milton, 2011).

## Barriers to Effective Knowledge Management

Researchers (Williams, 2008; Milton, 2005; Pilsmo, 2010; Rhodes & Dawson, 2013) have found the most significant barriers to effective implementation and use of knowledge management systems to be organizational culture, time, opportunity cost, lack of incentives, lack of management support and the temporary organization of projects.

**Organizational Culture** might be the most important one, even though a culture of negligence towards knowledge management activities often will arise due to the presence of other barriers. This is important because once a negative culture has formed in the organization, addressing all other barriers will not yield the desired results unless the culture - the dominant attitude in the organization - is also addressed.

Another crucial aspect is **Management Support**, as this is the basis for both time and motivation. Unless top management actively supports the system, there is little chance that time spent on knowledge management activities will be rewarded, if any time is allocated for it at all.

**Time** and **Opportunity Cost** are matters of the same cause - prioritizing knowledge management against billable hours or progress in other projects. Pilsmo's (2010) study highlights this issue. He found that while the management were promoting and encouraging the employees to reflect on the acquired knowledge, the consultants claimed that not enough time were provided to the task. This because there were always another project needing the resources. This is also a barrier in the beginning of projects, where there is often a rush to "get started", and not enough, if any, time is allocated to search for previous lessons learned. This causes a paradoxical situation where the organization knows there's an advantage to managing the knowledge, but fails to make it a priority.

A working and well maintained **System** is as previously mentioned a key aspect, at least to the codification methods of knowledge sharing. Subjects in the study done by Rhodes and Dawson (2013) reported that one of the main inhibitors of motivation was that the lack of a system where knowledge could easily be retrieved when needed crushed all motivation to spend time recording lessons.

While **Motivation** is a wide term, and will be affected by both available time, quality of systems, management support and peer culture, a lack of awareness of organizational or employee motivation could break any effort at the roots. Rhodes and Dawson (2013) found the greatest barriers to employee participation to be in relation to motivation. They explored the *internal* motivational factors, like knowledge management not being promoted by the organization as important, and the feeling that "no one else is doing it - why do we have to?" causing a lack of motivation. However, *external motivation* might also play an important role. If there is no reward system for sharing knowledge, and all performance is measured in short-term project performance, there is little motivation to spend time on knowledge management activities instead of jumping straight to the next project in which time is a measured factor. The correct application of a reward system is however rather tricky. In fact, a study (Knocko, 2009) found a negative correlation between use of rewards to incentivize submission of lessons and

satisfaction with the lessons learned system.

Another barrier is the **Temporary Organization of Projects**. Time-limitation is one of the definitions of a project, and while one of the strengths of project work, it can make knowledge transfer a challenge. If the project group is not locked together until after the knowledge gained has been recorded, it can be difficult to gather the same people again, as they are often engaged in other projects.

**Communication** is also a crucial component both for implementing and maintaining any system. Purpose, goals and milestones must be communicated throughout the organization, also continuously after implementation. Otherwise the thematic runs the risk of being gradually forgotten as often is after an initiative has passed the novelty interest phase.

Dunford (2000) however, found the most problematic and hardest aspect to overcome for a knowledge-intensive firm such as a consulting firm to be the **Individual Survival-Instinct**. There are almost always some individuals that live by the belief that one might benefit more from holding information than sharing information with others. Some believe that giving away knowledge is giving away power. One of the key challenges is to ensure an incentive reward system based on sharing information instead of holding it.

### Facilitating Activities

Koenig and Sirkantaiah (2004) identified five success factors for a successful knowledge management system: Leadership, culture, roles and responsibilities, IT infrastructure and measurement. Leadership or management support being the most important one. Based on this and their own findings, Rhodes and Dawson (2013) developed a list of facilitating activities for successful knowledge management implementation (paraphrasing):

- Remove redundant systems
  - Remove remnants of previous, failed systems to avoid confusion and uncertainty regarding what system is being used. It is important to give employees notice before switching in order to have time to transfer old info, as well as not giving the impression that “it’s not important enough to take care of previous lessons”.
- Introduce an official software tool
  - Enable employees to work consistently with the same system. This way everyone know what is to be used, allowing a more substantial collection of lessons to be recorded. Here usability is key, making searching and recording of lessons as easy and convenient as possible.
- Introduce an official knowledge management process
  - Let employees know when, where and how to record lessons and what is expected of them.

- Define and communicate knowledge management intent
  - A clear statement of intent enables everyone to be committed to the same objectives and to visualize what is trying to be achieved through the use of lessons learned and what priority this is given. The statement should be embedded in whatever official documentation and training produced by the organization.
- Market the process
  - All achieved benefits from the system must be published in order to provide continuous encouragement. This should be done through newsletters, notice boards and whatever other means of communication the organization uses. Some of this information should be aimed at team leaders. This will further instill confidence, as team members can see their management advocating lessons learned.
- Overcome time barriers
  - Knowledge management processes must be planned and prioritized. Adequate time must be formally allocated to the activities. In order to achieve this, management support is crucial.
- Publish success stories from using the system
  - Employees must see the benefits of their actions. Publishing success stories from using the system will encourage contributors, as they can see recorded lessons are being useful.
- Motivation
  - In order to motivate employees to continue recording lessons, a reward system should be in place. A monetary reward system can be “played”, and thus work against its purpose. Recognition has often proved to be enough, for example publishing a knowledge sharer of the month can be sufficient motivation. A third way can be a system of co-worker rating based on helpfulness.
- Allocate time to maintain the system
  - A person or group of individuals should be identified to take responsibility for the system to ensure that the system is easy to use and the lessons recorded are well written, relevant, properly indexed and not duplicated to ensure that the system will not become redundant.
- Incorporate into training
  - An official process and supporting software system could alert the organization to what lessons are being recorded and searched for. Which occur most frequently and what are the areas that employees struggle with? Organizations should use this information to identify areas of training that could be provided.

Finally, doing a questionnaire in the organization initial to introducing the system might show statistics that will encourage work on the system. If people can see the majority being unhappy about the way information is being shared, it will highlight the need for change.

## Summary

In this chapter we have provided some definitions to concepts used in the paper and reviewed the history and definitions of knowledge management. We have then looked at dividing knowledge processes based on organizational levels in the terms of organizational learning, knowledge management and knowledge governance.

We have further reviewed different classifications of knowledge management aspects in terms of a micro/macro knowledge level division, and seen that knowledge management can be seen as a circle where PMOs with proactive approaches to knowledge and learning provide mechanisms that allow for active knowledge search. This is likely to influence the willingness of project managers to engage in knowledge related activities. In consequence, this may impact knowledge behaviors and communication patterns among individuals and project teams, which in the longer term impact the PBOs' ability to build organizational capabilities and communities of practice.

Afterwards, we reviewed a classification of different methods of knowledge sharing, and when the different activities are suitable in the terms of Boh's two-scale classifications along two scales: Personalization vs. codification and individualized vs. institutionalized knowledge.

We have then looked at knowledge management in practice, and seen that smaller companies often follow an on-the-job developing of their competence, like work-related training in projects. We have reviewed a study of codification in practice, claiming ICT not being a very effective measure for knowledge sharing, while knowledge shared through social networks had been successfully used to a higher degree. This we believe may be caused by the lack of facilitating activities to properly maintain and use the system. Lessons learned should be easy to retrieve to facilitate actual later use, and when a lesson is written, it needs to be clear, quantified and written as a recommendation. It has also been argued that a lesson is not learned until something changes as a result. We have further looked at what and when to record lessons, and seen that learning in a project takes place both at the start, during and at the end of the project.

We have reviewed the most significant barriers to effective implementation and use of knowledge management systems and found them to be organizational culture, time, opportunity cost, lack of incentives, lack of management support, the temporary organization of projects and the Individual Survival-Instinct. Five success factors for a successful knowledge management system have been identified to be leadership, culture, roles and responsibilities, IT infrastructure and measurement. Finally, we have presented a list of ten facilitating activities for successful knowledge management implementation.

This theory will be the basis for our research, as well as the theory-based recommendations we will present in the recommendations chapter. We believe this gives a thorough understanding of the concepts, and provides a solid basis for further analysis.



## Methodology Theory

In the following chapter we will guide the reader through the methodology part of our research. The logic behind the structure of this chapter is to give the reader an idea of what is important to focus on in each stage of a case study research. In addition to the guidelines presented in each stage/subchapter, we will elaborate on our ideas and procedures at the end of each stage.

The guidelines presented in each stage in this chapter, relies heavily on Yin's "Case Study Research: Design and Methods" (2009), and will follow his proposed case study process. This process includes six different steps: Plan, design, prepare, collect, analyze, and share. Subchapters one and two will cover the planning phase, while the remaining chapters will be titled the same as their respective stage.

## Case Study Methodology

According to Bromley (1990), the case study is a "systematic inquiry into an event or a set of related events which aims to describe and explain the phenomenon of interest". Yin (2009) offers a straightforward and easy to follow protocol for the inquiry described by Bromley. The proposed structure of Yin's case study protocol, which is described as a linear but iterative process (Figure 3), intends to assist the researcher in carrying out the case study while simultaneously focus on the reliability of the research (Zucker, 2009).

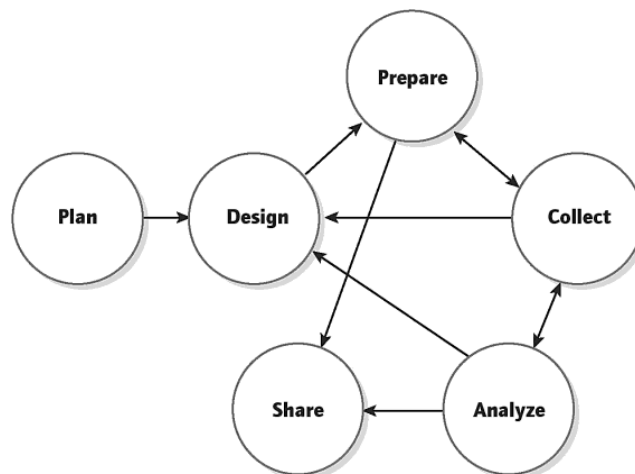


Figure 3: Case Study Procedure (Yin, 2009)



## The Front Phase: Choosing the Right Method

The central question when choosing a research method is asking how we can get the information we are looking for. As we've been told a dozen of times as scholars, there is no research method superior to other research methods. The choice of method is indeed highly context sensitive.

According to Yin (2009) the researcher(s) should consider three aspects when deciding which method to apply:

1. The type of research question posed
2. The degree of control an investigator has over actual behavioral events.
3. The degree of focus on contemporary events as opposed to historical events.

Method	1. Form of research question	2. Requires control of behavioral events	3. Focuses on contemporary events
Experiment	How, Why?	yes	yes
Survey	Who, What, Where, How many, how much?	no	yes
Archival analysis	Who, What, Where, How many, how much?	no	yes/no
History	How, Why?	no	no
Case study	How, Why?	no	yes

One important aspect when choosing a research method is that the methods are not mutually excluding. One could have a case study within a survey, or a survey within a case study. But this should only be done if this specific mix gives an advantage that could not be achieved by choosing any other method (Yin, 2009).

The different research methodologies can serve different purposes (Runeson and Høst, 2008).

We can distinguish between four types of purposes for research methodologies:

- Exploratory: Trying to understand what is happening, seeking new insight and generating ideas and hypothesis for new research.
- Descriptive: Portraying a situation or phenomena.
- Explanatory: Seeking an explanation of a situation or a problem, mostly but not necessary in the form of a causal relationship.
- Improving: Trying to improve a certain aspect of the studied phenomenon.

(Robson, 2002)

While the case study primarily was used for exploratory purposes, it has recently been used for descriptive and improving purposes also. Due to the problem of isolating factors, the use of case study methodology for explanatory purposes has its clear limitations (Runeson and Høst, 2008).

### *Our Ideas and Procedures*

As our interest is primarily how the theoretical connection between facilitating activities and knowledge management success matches the observed condition in the case company, the two methods, experiment and case study, should be considered. Further, we don't need or have control over behavioral events, and our focus is mainly on contemporary events, which leads to our choice of method being the case study (see table above). As a supplement to this method, we will utilize the advantages of the questionnaire tool to get a more holistic view of the case company's use of facilitating activities, and their view on knowledge management in projects.

### **Quantitative and Qualitative Research**

Science can be defined as efforts to describe a phenomenon, or find causalities between entities in the physical world. Science also includes different objectives. The purpose could be to test if existing knowledge still remains valid, search for new knowledge or trying to understand a phenomenon.

It is common in social science to distinguish between two types of research: qualitative research and quantitative research. It is difficult to formulate a proper definition of these two types of research, though they have certain characteristics that distinguish them from one another. In *qualitative* research the researcher is generally closer to the informant. By this we imply that the researcher gets a more subjective description of the experience of the informant. This gives the researcher the opportunity to get a deeper understanding of the phenomenon sought to be described. As an effect of the emphasis on getting a deep understanding, it is common to have fewer informants in qualitative research than in quantitative research. An additional characteristic of this research is that one is usually not testing hypotheses, since qualitative research is often exploratory (Lund & Haugen, 2006).

There exist several definitions of *quantitative* research. One of the more concise definitions of the term is: "Explaining phenomena by collecting numerical data that are analyzed using mathematical based models (in particular statistics)" (Creswell, 1994). While this is a definition that is relatively hard to argue against, there are some characteristics that are not covered. As we mentioned in the section above, quantitative research often has more informants than qualitative research, and it often includes a hypothesis (Lund & Haugen, 2006).

Most case studies are based on qualitative data, which generally gives a deeper and better description than quantitative procedures. It is however, possible to use both qualitative and quantitative data in combination when conducting a case study. The latter strategy is often referred to as mixed methods (mixing both qualitative and quantitative data in the same research study), and tends to provide better understanding of the studied phenomenon (Runeson and Høst, 2008).

### *Our Ideas and Procedures*

Our problem description is of an explanatory nature. Therefore, we have decided that to get an overview of such a complex process as capturing and sharing knowledge, it is essential to get a deep understanding of the current state by collecting data from key personnel in the case company. As mentioned in a previous section, the data collected from key personnel will be

supplemented by answers from the employees in the case organization by using a questionnaire. This implies that our report will rely on both qualitative and quantitative data (mixed methods).

## Research Design

The main purpose of the research design is to help avoid the situation in which the obtained evidence does not address the initial research questions. Put in other words: It is the research designs objective to connect the empirical data to a study's initial research questions and, ultimately to its conclusion. There are five components of the research design that are especially important.

1. A study's questions
2. Its propositions, if any
3. Its unit(s) of analysis
4. The logic linking the data to the propositions
5. The criteria for interpreting the findings

(Yin, 2009)

Although the first component has already been covered in the beginning of this chapter, Yin (2009) emphasizes that in this stage it is important to examine previous research addressing similar questions. This is an important task, not only for increasing the general value of your research, but also to stimulate and possibly trigger the researcher's imagination.

The second component serves as a mean to direct the attention of the researcher to something that should be examined within the scope of the study. Some studies have a topic that is the subject of exploration and will have a legitimate reason for not having a proposition. However, the researchers are encouraged to identify a purpose for the research (Yin, 2009).

The unit of analysis (the case) could not only be defined as a person or an organization, but could also be a decision, program or a process. To help defining the case, one should use the case study's question and propositions as a guide to understand exactly what you are studying (Yin, 2009).

Yin (2009) does not offer any specific advice when talking about linking the data to the propositions, other than that if the researcher has limited experience in doing empirical studies it is difficult to anticipate the proper analytic technique, or to anticipate the right amount of data needed to conduct the analysis.

The last component addresses the criteria for interpreting a study's findings. A good example of such a criterion is the p level, which is often used in quantitative studies to determine if a finding is statistically significant. There is no such rigid test for interpreting a case study's findings. However, the principal of addressing rival explanations for your findings is an important strategy to strengthen the quality of the study.

In addition to the five components mentioned above, the role of theory development in a case study is important. According to Yin (2009) it is important to do theory development prior to the data collection of data. This is done because it strengthens the design and makes the researcher better equipped to interpret the eventual data. In this phase it is also important to focus on which types of theories that might be relevant to your study (for example group theories, organizational theories or societal theories).

The theory development is also an important aspect when the conclusion regarding generalization is to be made. It is important that the case study researcher is able to distinguish between what is called statistical generalization and analytic generalization. The former being an inference made about a universe based on the empirical data collected from a population from that universe. The latter type of generalization by using previously developed theory as a template with which to compare the empirical results of the case study. The case study should not be seen as a sample from a universe, but should be viewed as an experiment (multiple case studies, by this logic, equals multiple experiments).

### *Criteria for Judging the Quality of Research Design*

In order to view information as knowledge, it has to pass certain quality tests. In research these quality tests are covered by the term validity. The validity system we introduce and describe in this section is accepted and used in among others the fields of psychology and pedagogy. The system is developed by Campbell et al. (2002).

The validity system consists of three inferences and their validities. In addition there are sets of threats for each type of validity, which can weaken the different validities (Lund & Haugen, 2006). In addition to the three validity tests there is a fourth test, termed reliability:

#### **Construct validity:**

The validity with which we can make inferences about the higher order constructs being investigated from the particular characteristics of the study (B. Johnson and L. Christensen, 2004).

#### **Internal validity:**

The validity with which we can infer that a relationship between two variables is causal (B. Johnson and L. Christensen, 2004).

#### **External validity:**

The validity with which we can infer that the relationship between the variables investigated holds over different people, settings, times, treatment variables, and measurement variables (B. Johnson and L. Christensen, 2004).

#### **Reliability:**

To what extent the instrument yields the same result when tested in different periods of time and on different groups of the population (Joppe, 2000).

The different validities are not always relevant, and should be seen in context with how the problem to be addressed is formulated. Internal validity for instance is only relevant if the researcher wants to study a cause-effect relationship (Lund & Haugen, 2006).

For the case study there are several tactics that should be used throughout the different stages of the case study research. The different quality tests, the different tactics attached to these quality tests, and the respective phases they should be carried out in, is shown in the table below.

<b>Quality test</b>	<b>Case study tactic</b>	<b>Phase of research in which tactic occurs</b>
<b>Construct validity</b>	<ul style="list-style-type: none"> <li>• Use multiple sources of evidence.</li> <li>• Establish chain of evidence,</li> <li>• Have key informants review draft.</li> </ul>	data collection data collection Compositions
<b>Internal validity</b>	<ul style="list-style-type: none"> <li>• Do pattern matching.</li> <li>• Do explanation building.</li> <li>• Address rival explanation.</li> <li>• Use logic models.</li> </ul>	data analysis data analysis data analysis data analysis
<b>External validity</b>	<ul style="list-style-type: none"> <li>• Use theory in single-case studies.</li> <li>• Use replication logic in multiple-case studies.</li> </ul>	research design research design
<b>Reliability</b>	<ul style="list-style-type: none"> <li>• Use case study protocol.</li> <li>• Develop case study database</li> </ul>	data collection data collection

(Yin,2009)

## Case Study Designs

Yin (2009) distinguishes between four types of case study designs, presented in a 2x2 matrix:

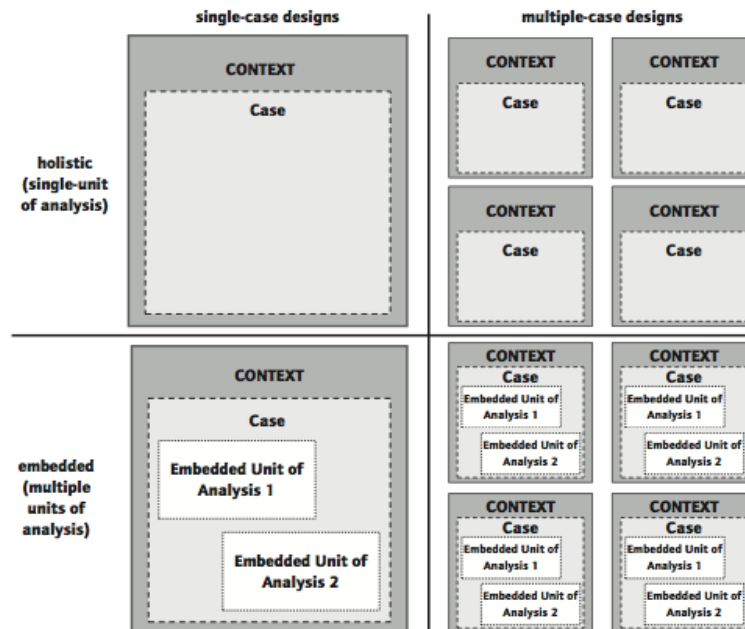


Figure 4: Case Study Designs (Yin, 2009)

As the boundaries between the context and the case are not likely to be sharp, they are represented by dotted lines. The picture illustrates the four types of case study designs: single holistic case, single embedded case, multiple holistic cases, and multiple embedded cases.

There are different rationales for doing each of the mentioned designs. For the single case study design we will elaborate on five different rationales.

- Critical case: Valid when one wants to test well formulated theory which has specified propositions that are believed to be true.
- Unique case: Valid when the case is believed to be rare or extreme.
- Representative case: Valid when the case is believed to be a typical case, where the objective is to capture the conditions of an everyday situation.
- Revelatory case: Valid when it is believed that one has the opportunity of capturing data from a phenomenon previously inaccessible.
- Longitudinal case: Valid when observing how different conditions change over time.

(Yin, 2009)

Including multiple cases in a case study (multiple case designs), has both advantages and disadvantages compared to single case designs. The results from a multiple case study are often viewed as being more robust than single case designs. At the same time, the rationales for doing a single case design are not usually valid when satisfied when doing a multiple case design (the most obvious is perhaps the unique case rationale). In addition, the time and resource cost of multiple case design can be considerable (Yin, 2009).

Regardless if one has chosen single or multiple case designs, the identification regarding if the case is embedded or holistic is important. An embedded case study is a study where you divide the unit of analysis into two or more subunits, and a holistic case study is the opposite. A holistic case study should be chosen when no logical subunits can be identified (Yin, 2009).

### *Our Ideas and Procedures*

Both our research question and our proposition came as a result of studying previous research. Reading and reflecting upon previously published writings within our theme of interest helped us pinpoint what we wanted to study. A considerable amount of time was used in an iterative process of defining both our research question and proposition.

### Research question

How does the theoretical connection between facilitating activities and knowledge management success match observed conditions in the case company?

### Proposition

Facilitating activities counteract barriers to successful knowledge management in project based organizations.

Further, the research question and the propositions led us to the conclusion that the unit of analysis is the knowledge management system within the context of the case company.

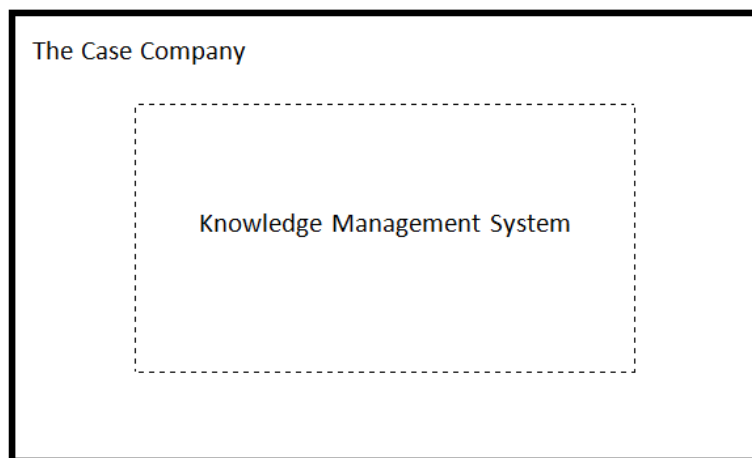


Figure 5: Unit of Analysis

As illustrated above, we intend to analyze the knowledge management program as a holistic unit within the context of the case company. We evaluated the possibility to divide the case (knowledge management system) into subunits, but realized that no logical units could be identified.

Despite the clear advantages of the multiple case design regarding the quality of a study, we chose the single case study design. One of the reasons for this choice was the relatively poor response from possible case companies. As time went by, only one company of the contacted

firms were willing to participate in our study.

Another reason for choosing a single case design is that our research question and proposition is supported by a single case rationale. Both our research question and proposition aim to test theories that are believed to be true (Critical case rational).

The tests regarding the strength of our research (validity and reliability) will be discussed in later chapters. However, the tactic that concerns external validity and single case studies was followed, as we are predicting a pattern based on previous stated theories.

## Prepare

This phase focuses on the preparation prior to the collection of the case study data. Yin (2009) points out that the case study research demands more of the researcher's intellect, ego and emotions than any other research method. The researcher should therefore have certain skills to be able to take advantage of unexpected opportunities. The commonly required skills are:

- The researcher should be a good listener.
- The researcher should be adaptive and flexible.
- The researcher should have a firm grasp of the issue being studied.
- The researcher should be unbiased by preconceived notions.

An additional aspect that is important in the preparation phase is to be aware of the fact that you are (most likely) studying a contemporary event in a real life context, and that protection and confidentiality of individuals and organizations should be of a high priority.

To strengthen the reliability of your research, you should operationalize the research process as much as possible. A case study protocol is a formal document that should capture the entire procedure in the data collection phase. This document should include an overview of the case study project, field procedures, case study questions, and a guide for the case study report. In addition to increase the study's reliability, it also makes you anticipate future problems (Yin, 2009).

## *Our Ideas and Procedures*

The suggested required skills of a good case study researcher served as great guidelines through the construction of the questionnaire and interview questions. A lot of our focus went into formulating good and unbiased questions in both the construction and the conducting phase of the questionnaire and the interviews.

A case study protocol was created to ensure the thesis reliability. This protocol is based on the suggested outline presented by Pervan and Maibo (2005), and is updated continuously. The protocol has the following chapters:



Section	Content
Preamble	Contains information about the purpose of the protocol, guidelines for data and document storage and publication.
General	Provides a brief overview of the research project and the case research method.
Procedures	Detailed description of the procedures for conducting each case, including down-to-earth details on contact and timing.
Research instruments	Interview guide, questionnaires etc. to be used.
Data analysis guidelines	Detailed description of data analysis procedures, including data schemas, priori codes etc.

The case study protocol is presented as appendix 1.

## Collect

Yin (2009) points out that the data collected should derive from more than one source. He mentions six different sources of data (documents, archival records, interviews, direct observation, participant observation, and physical artifacts) that all require different procedures to be extracted. The researcher should apply three different data collection principles, regardless of the sources used.

In this section we will briefly describe the different sources of evidence we intend to use in our study (Interview, questionnaire, and documents). In addition we will briefly elaborate the three different data collection principles that are important in the data collection phase.

## Interview

One of the most important sources of evidence when conducting a case study, are interviews. During the interviews, the researcher should focus on two things:

1. To follow your own line of inquiry.
2. To ask unbiased questions.

As with other sources of evidence, the interview has its strengths and weaknesses.

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>● Targeted - focuses directly on case study questions.</li> <li>● Insightful - provides perceived causal inferences and explanations.</li> </ul>	<ul style="list-style-type: none"> <li>● Bias due to poorly articulated questions.</li> <li>● Response bias.</li> <li>● Inaccuracies due to poor recall.</li> <li>● Reflexivity - interviewee gives what interviewer wants to hear.</li> </ul>

The depth and length of an interview can range from an in depth interview through multiple sittings, to a survey like interview that lasts no more than half an hour. A focused interview is somewhere in between these two extremes. This type of interview usually lasts around an hour, where the interviewer follows a set of questions, but still has the flexibility to do it in a conversational manner. (Yin, 2009)

If you for example want to know “why” some event or process occurred, Becker (1998) points out that posing a “how” question, when you really want to know “why”, serves as a good way to get the interviewee to act more open and less defensive.

### Questionnaire

The questionnaire is a commonly used tool to gather information. A questionnaire could either be structured in an open way or a closed one. By having open ended questions in the questionnaire, the analysis of the gathered data will be qualitative, while having closed questions will lead to a quantitative analysis of the gathered data. (Bird, 2009)

### Documents

Documents cover all written information that is not created as a result of the case study. This category covers for example e-mails, administrative documents, news clippings, and articles. The strengths and weaknesses of documents as a source are listed in the table below.

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>● Stable - can be reviewed repeatedly.</li> <li>● Unobtrusive - not created as a result of the case study.</li> <li>● Exact - contains exact names, references, and details of an event.</li> <li>● Broad coverage - long span of time, many events, many settings.</li> </ul>	<ul style="list-style-type: none"> <li>● Retrievability - can be difficult to find.</li> <li>● Biased selectivity, if collection is incomplete.</li> <li>● Reporting bias - reflects (unknown) bias of author.</li> <li>● Access - may be deliberately withheld.</li> </ul>

### Three Principles of Data Collection

The first of the three principles is to use multiple sources of evidence. The logic behind the use of multiple sources is to be able to perform what is termed data triangulation. Triangulation of data is done when the events or facts of the case study have been supported by more than a single source of evidence. This procedure can also improve the construct validity of the study, as multiple sources can be seen as multiple measures of the same phenomenon.

Creating a case study database is the second principal to be addressed. This database is supposed to contain raw, unbiased and uninterpreted data. This database could be viewed by and inspected by other independent researchers.

The third and last principle is to maintain a chain of evidence. The case study should allow the external observer (the case study reader) to follow the derivation of any evidence from the initial questions to the conclusion.

### Our Ideas and Procedures

The procedures of gathering data by conducting a questionnaire and interviews are described in detail in the case study protocol, and will therefore not be discussed in this section.

The use of multiple sources of evidence has been followed by using interviews, questionnaire, and relevant documents. Further, the construction of a case study database was done. This

database contains raw data from the questionnaire, as well as answers from the interviews (presented as appendix 2).

## Analyze

It is important that the analysis of the case study data follows a general analytic strategy. Having a strategy will help the researcher treat evidence fairly, produce compelling analytic conclusions and rule out alternative interpretations. Yin (2009) presents four such strategies, together with five different techniques for analyzing case study data. The strategies and techniques are not mutually exclusive, and could be used in any combination. To be sure that the gathered data can be analyzed, it is important to be aware of the choice of strategies and techniques before the collection phase.

In this section we will present three different analytic strategies and the one analytic technique that was found to be fit our research question best. We will further present the four different principles that one should follow when analyzing the evidence, as well as how to interpret the quantitative analysis of a questionnaire. The last section in this chapter will briefly address analysis of qualitative data.

## Analytic Strategies

### Relying on Theoretical Propositions

This strategy relies on following the theoretical propositions that led to your case study. The propositions of the case study would have shaped your data collection and therefore would have given priorities to a relevant analytic strategy. The propositions also help to focus attention on certain data and to ignore other data.

### Using both Quantitative and Qualitative Data

Case studies can include substantial amounts of quantitative data. Including statistical analysis in addition to qualitative data in the case study is according to Yin (2009) a strong analytic strategy. The quantitative data may be relevant for at least two reasons. The first reason is that the quantitative data may cover the relevant behaviors or events that are relevant for the case study. The second one is relevant if the quantitative data is related to an embedded unit of analysis within the broader case study.

### Examining Rival Explanations

The last strategy is to test rival explanations. This strategy works well with either of the other mentioned strategies. The theoretical propositions might have included rival hypothesis, and the use of both quantitative and qualitative data may cover rival conditions to be examined.

## Analytic Techniques

### Pattern Matching

According to Yin (2009), the pattern matching technique is one of the most desirable techniques when conducting a case study. The logic behind this technique is to compare an empirically

based pattern with a predicted one. If these patterns coincide, the results can help strengthen the researches internal validity

#### Four Different Principles

Regardless of the chosen strategies or techniques, there are at least four principles that ensure that your analysis is of high quality. The first principle is to show that you have addressed all the obtained evidence. If you fail to follow this guideline, the analysis may be vulnerable to alternative interpretations based on available evidence you for some reason have ignored. The second principle deals with rival interpretations. Questions regarding alternative explanations for one or more of your findings should be asked. This principle is especially important in explanatory case studies, as it greatly affects the internal validity of the research. Third, the analysis should address the most significant aspect of your case study. The fourth principle is to show awareness of the case study topic by using your own expert knowledge (Yin, 2009).

#### Questionnaire Analysis

When analyzing data obtained from a questionnaire with closed answers, researchers commonly use the correlation coefficient to get indications of relationships between variables. The next section will focus on explaining the correlation coefficient as well as the coefficient of determination.

#### Correlation Coefficient

The correlation coefficient is a measure that tries to describe how strong a relationship between two variables is. It also tells us the direction of the relationship. The correlation coefficient can take any value between -1 and 1, where a negative value indicates a negative relationship, and a positive value indicates a positive relationship. One such measure that is often used in correlation research is Pearson's product-moment correlation coefficient ( $r$ ):

$$r = \frac{\sum XY - \frac{\sum X \sum Y}{n}}{\sqrt{\left[\sum X^2 - \frac{(\sum X)^2}{n}\right] \left[\sum Y^2 - \frac{(\sum Y)^2}{n}\right]}}$$

(Valås, 2006)

One may also evaluate the strength of the relationship by using a scatterplot. For instance, if the data points are grouped closely in a narrow pattern, this is an indication that there is a strong relation. (Lodico et al., 2006)

One important issue is how to interpret the meaning of the correlation coefficient. Is 0,7 a strong correlation, or is it a moderate correlation? Unless the correlation coefficient can be properly interpreted, it is without meaning. There are labeling systems that try to categorize the coefficient. Gerstman (2003) consider  $\geq 0.3$  to be weak correlations, 0.3-0.7 to be moderate correlations, and 0.7-1 to be strong correlations. However, describing a correlation coefficient as weak, moderate or strong is not very meaningful (Taylor, 1990).

A question that is important to address is whether the correlation coefficient is statistically significant, or if the observed  $r$  has occurred by chance and there exists no real correlation at all. The critical values for correlation statistical significance vary depending on the sample size and the level of the significance the researcher wants to use. There are tables with varying sample size and significance level that state (given that the variables are normal distributed) the minimum level of  $r$  that is needed to conclude that the correlation is statistically significant (Taylor, 1990).

From the section above we can extract that the correlation coefficient is not easy to interpret. Though this coefficient is most used when it comes to statistical testing, the coefficient of determination is perhaps less abstract and easier to interpret. This coefficient is obtained by simply squaring the correlation coefficient. The coefficient of determination expresses the percentage of the variation in the values of the dependent variable, which can be “explained” by variations of the independent variable. Given that we have a correlation coefficient equal to 0.34, the coefficient of determination shows that only 11.5 % ( $0.34^2$ ) of the variation in the dependent variable could be explained by the variations in the values of the independent variable. (Taylor, 1990)

It is important to note that the traditional correlation study is subject to limitations. By using Pearson’s correlation coefficient, you are measuring how closely the variables fit a straight line (linear relationship), and therefore does not take into account that there could be a nonlinear relationship. Regression analysis can be used to further investigate the nature of a relationship. (Taylor, 1990)

### *Interview Analysis*

The main objective of qualitative data analysis is to derive conclusion from the data by showing a clear chain of evidence. This is done by structuring the derivation of the results and conclusions from the data, in a way that makes it easy for the reader to follow. In addition, it is beneficial to be more than researcher when conducting the analysis, as it reduces the risk of biased interpretations (Runeson and Høst, 2008).

### *Our Ideas and Procedures*

In our study we followed all three analytic strategies. Our proposition made us able to focus on certain aspects of the data collected from the interviews, questionnaire, and documents. Further, both quantitative data (questionnaire) and qualitative data (interviews and documents) are used as evidence in this report. The strategy regarding addressing rival explanations has been followed in the way that we always question our thoughts and conclusions.

The pattern matching technique was chosen as it aims to compare a theoretically based pattern with an empirically based pattern. We started the analysis with structuring the data from the questionnaire in MS Excel. After this was done, we performed a correlation analysis of the data.

The statistics were then used to help us construct the agenda of the interviews. Our main focus when analyzing the different data was to address all of it in a structured and

unbiased manner. For detailed description of the procedures regarding the analysis of both the qualitative and the quantitative data, go to the case study protocol (appendix 1).

## Share

Designing the case study report is one of the most challenging tasks when doing a case study. Three steps should be considered when structuring the report.

1. Identifying the audience of the report.
2. Developing the compositional structure.
3. Having drafts reviewed by others.

A general advice is to finish parts of the case study before finishing the data analysis part. It is beneficial to complete the theory and methodology part before the collection of data, as it can help the researcher focus on what data to gather, and to avoid potential pitfalls (Yin, 2009).

### *Our Ideas and Procedures*

As mentioned in a previous section, both the theory development and the methodology were finished prior to the collection of data.

Regarding the proposed steps when structuring the report, the compositional structure of the thesis has been clear from the start, and has only been altered slightly during the case study process. Drafts of the report have been reviewed by our supervisor. Further the audience of this paper is primarily the academic community, and the report has been written with this in mind. In the next chapter, the analysis of the data and the results are presented and discussed.

## Research Results

In this chapter, we will first present a short introduction of the current state of knowledge management in the organization. We will then present the results from our initial questionnaire among employees in Faveo with short comments to these. Interview raw data will be added as an appendix, and then further discussed in the Analysis and Discussion section of the thesis.

### Current State in the Company

Based on information from the R&D director and ICT director, accompanied with their official strategy document, we have gathered the following concrete information about intentions and routines in Faveo.

#### Operational Routines

Faveo do not operate with a knowledge manager in projects. They do however have an R&D director with the responsibility for knowledge management in the organization. In projects they generally have a project leader responsible for project execution and a project supervisor with overseeing responsibility, not doing project work. Knowledge retention from projects naturally falls within the scope of the project leader, but focus on these tasks varies among employees.

The main source of knowledge sharing is Faveo Academy, which is responsible for gathering best practices and sharing it throughout the organization in the form of themed events, breakfast meeting and courses. Participation in these events is encouraged, but voluntary.

#### IT System

Faveo is using an information portal based on Microsoft SharePoint, which contains their project methodology, experience documents, intranet and other project-related information, as well as personal pages with individual pages for highlighting competence (who knows what). Everyone has access to add experience documents, while certain employees are responsible to quality control of added information. Project methodology is the responsibility of the R&D director.

When the new system was implemented in 2011, valuable information from the older systems was transferred, and access to the old systems was removed.

### Strategic Initiatives

In Faveo's strategy document for 2013-2016, one of six focus areas is competency development (translated):

#### Competency Development

Particularly derived from the strategy work is that Faveo Academy shall be a very good internal tool for human resource development, which can be used externally where otherwise fit and we have plans and resources for external training

#### Goal

Faveo is to be one of the most attractive companies for the competency development of project

managers and consultants / specialists, enable to retain and attract the brightest people.

#### Main strategies

Develop employees through Faveo Academy.

Get in place internal educational stages.

Further development of external courses where appropriate in our strategies.

Develop or convert methodology / tool box into good tools for our business.

Consider acquisitions or strategic partners in human resource development and methodology.

Demonstrate our expertise and create pride.

#### Tools for monitoring the strategy:

Needs appraisal through performance reviews.

Clear management of human resource development.

Branding of Faveo as a knowledge business.

Cooperation with universities and colleges.

#### Strategic Initiatives - Group

There shall be established an overall structure, organization and content of the (Faveo) Academy and a methodology that ensures comprehensive competency development and a "toolbox" for "World-Class Project Management". Faveo shall ensure knowledge transfer from experienced people to younger talents who can take this further. The expertise must be documented, "product packaged" and presented to relevant audiences.

(Faveo Management AS Strategiplan 2013 - 2016)



## Quantitative Data

Initially in our research, we distributed a questionnaire among the Faveo employees in Norway. The questionnaire was done through an online survey written in English and distributed by email.

The purpose of the questionnaire was to establish an understanding of the current state of awareness and use of knowledge management activities in the organization. We also looked for possible correlations between use of knowledge management activities and satisfaction variables among employees in order to determine whether those who more frequently used knowledge management initiatives were more or less satisfied with the system in regards to for example information availability.

## Sample

Questionnaire sent to: 197

Opened link: 85

Started Questionnaire: 52

Completed Questionnaire: 40

Average participant age: 50,78 years

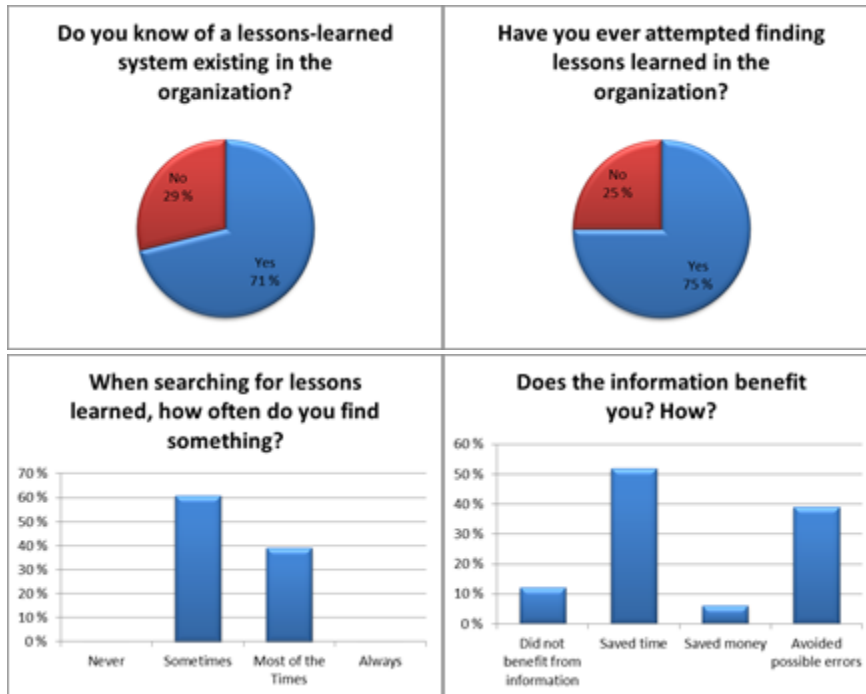
Average participant years of project experience: 21,63 years

## Comments

We believe a large degree of the participants not completing the survey might be to the fact that it was written in English, which is not the professional language of Faveo. We make this deduction based on the fact that mostly all who did not complete left the survey very early. A sample of 20,3% of the entire population must however be considered to be a representative selection.

## Results

### Awareness and Effectiveness



(Optional) Other given benefits of information:

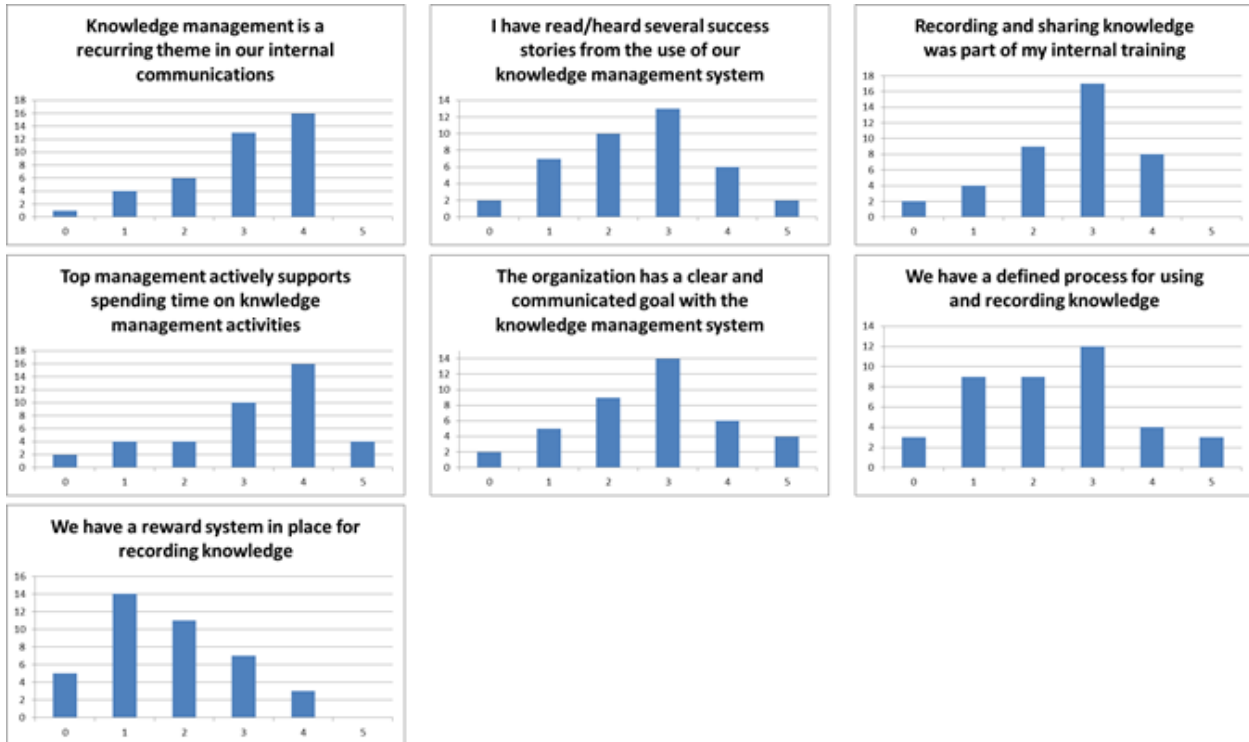
- Konkret hjelp i prosjekter
- Knowledge of existing competence connected to opportunities of sale.
- Increased my knowledge
- Help to choose methodology and execute the job
- More knowledge
- confirmation

### Comments

As much as 29% do not know of a lessons-learned system in the organization. This is a quite significant sign of lack of awareness around the subject.

Those who have attempted searching for information report finding relevant results sometimes or most of the times. On a purely quantitative level, this points to employees at average very often not finding relevant information when searching for it.

## Facilitating Activities



(Strongly Disagree / Disagree / Somewhat Disagree / Somewhat Agree / Agree / Strongly Agree)

Are these activities / functions present in most projects:



If any other systems for sharing knowledge are present in the organization, please describe them briefly:

- Faveo Academy collected knowledge once.
- Felles gjennom prosjekteringsunderlag med fokus på erfaringsoverføring
- System: The internal web-portal - methodology and training material/courses, Individual pages for highlighting competence (who knows what)
- Systematically: share experiences and good stories in the portal blogs, news or in theme-based discussions in the Faveo Academy (temakvelder, frokostmøter etc.), as

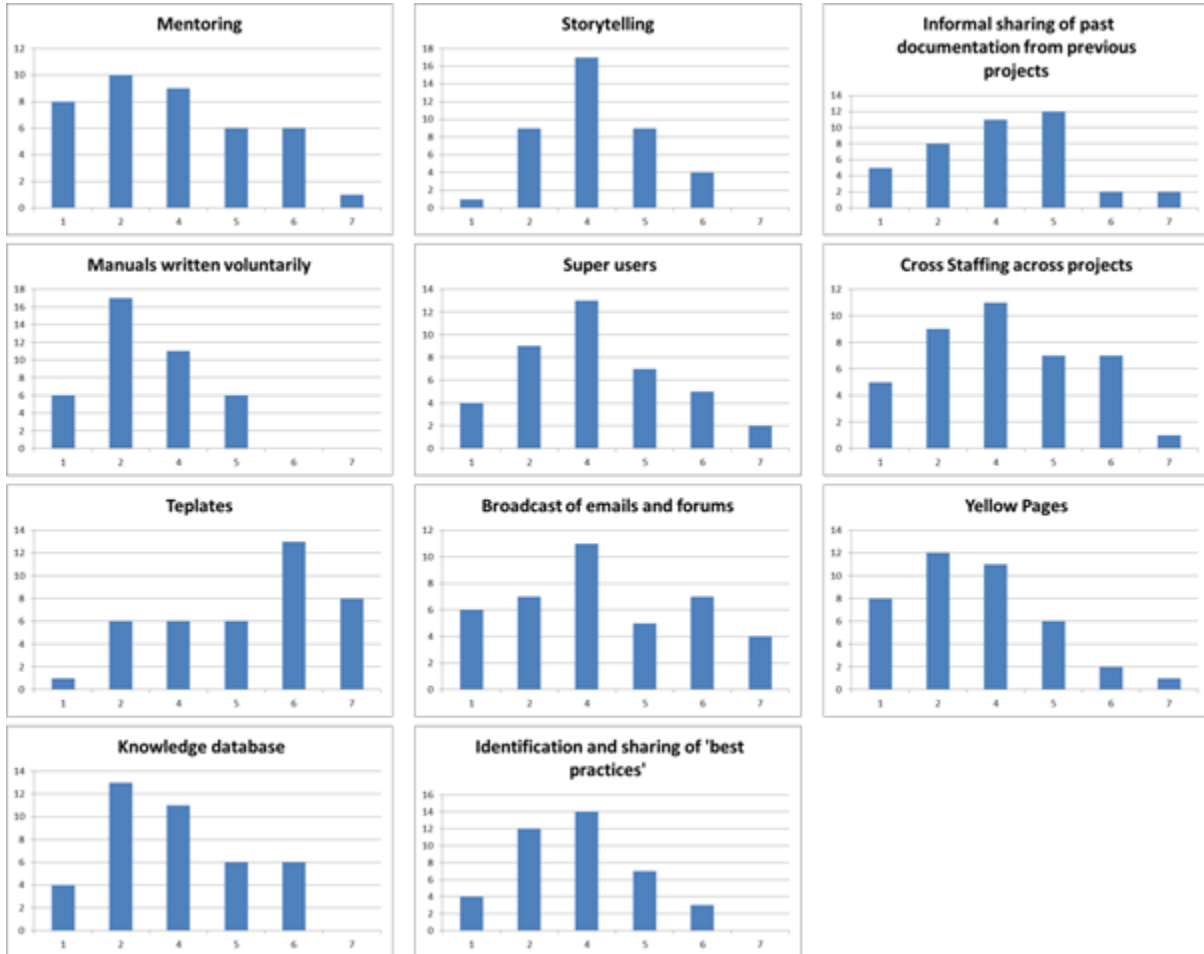
well as community of practice networks on some specialist areas.

- Norge konferansen: Our own development conference where all employees take part (annually).
- We have an open and sharing organization that actually works like that on a daily basis. Probably the most sharing organization I've ever been in.
- Internal initiatives and person to person activities.

### Comments

As we can see, there are great variations in the perception of the various activities. This will be further discussed in the analysis and discussion chapter.

## Knowledge Management Activities

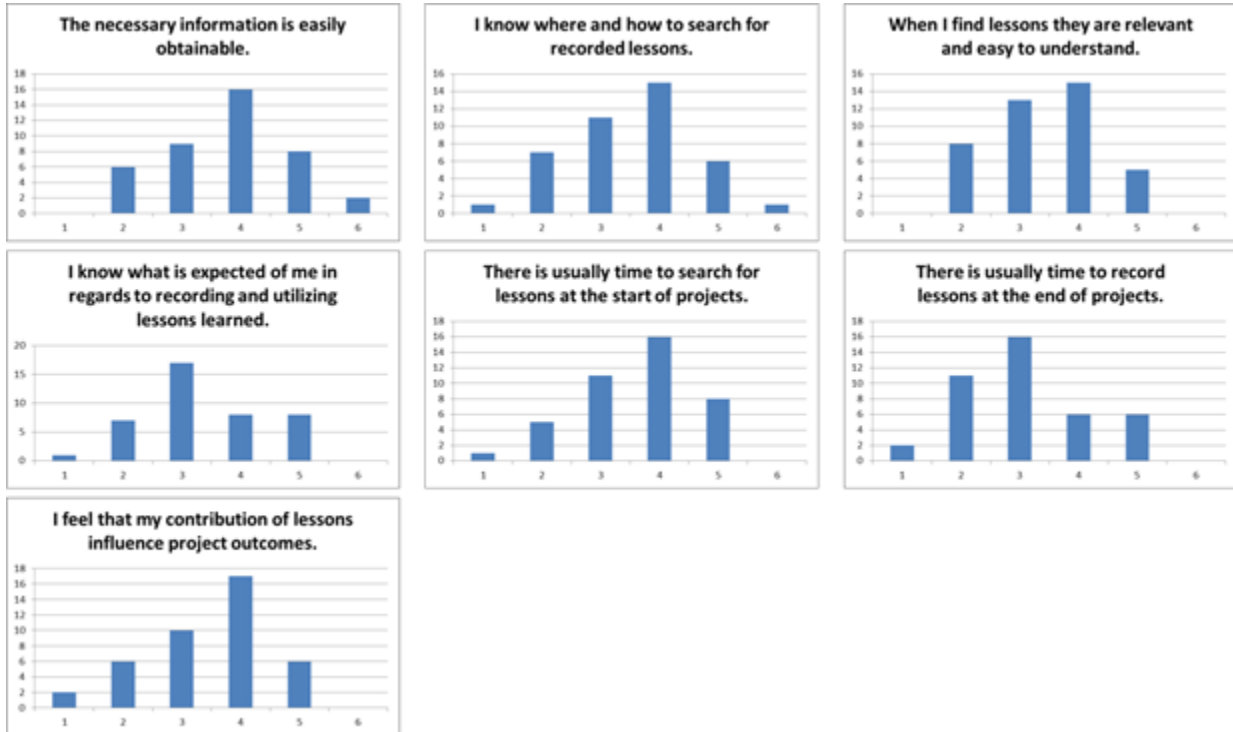


(Never /Once / About every other month / Monthly / Weekly / Daily)

### Comments

As we can see, there are great variations in the extent of use of all activities. This data is mainly used for correlation statistics. These will further be discussed in the Formal Systems section of the analysis and discussion chapter.

## Effectiveness



(Strongly Disagree / Disagree / Somewhat Disagree / Somewhat Agree / Agree / Strongly Agree)

## Comments

As we can see, there are great variations in the perception of the various effectiveness measures. This will be further discussed in the analysis and discussion chapter.

## Motivation

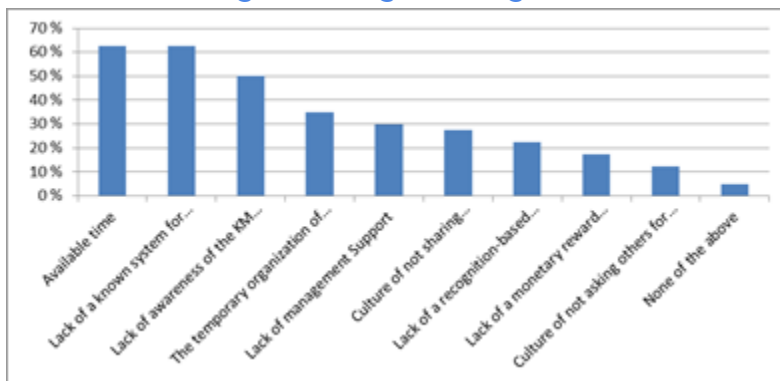


(Strongly disagree/Disagree/Somewhat Disagree/Somewhat Agree/Agree/Strongly agree)

## Comments

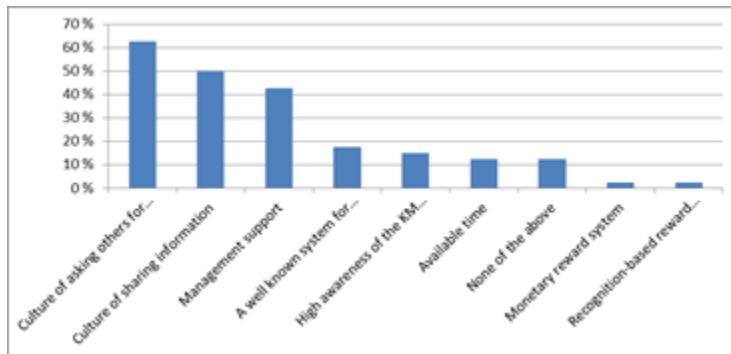
As we can see, the research subjects do see the importance of knowledge management. There are however some indicators that some motivational aspects are lacking, as well as an indicator that recording knowledge currently is not working very well. This will be further discussed in the analysis and discussion chapter.

## Factors Hindering Knowledge Sharing



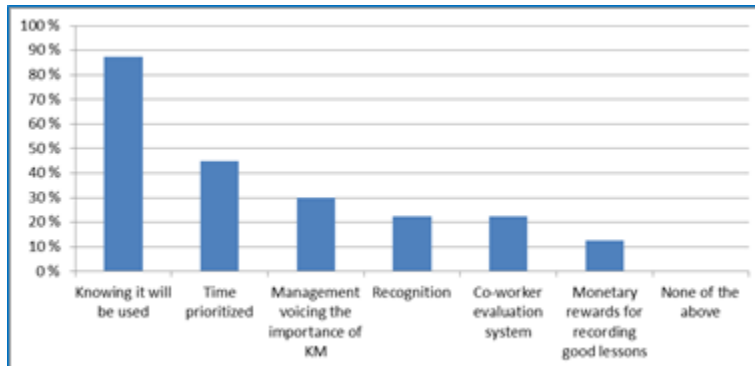
	Checked	% of respondents
Available time	25	68 %
Lack of a known system for recording knowledge	25	68 %
Lack of awareness of the KM process	20	50 %
The temporary organization of project groups	14	38 %
Lack of management Support	12	30 %
Culture of not sharing information	11	28 %
Lack of a recognition-based reward system	9	23 %
Lack of a monetary reward system	7	18 %
Culture of not asking others for help/advice	5	13 %
None of the above	2	5 %

### Factors Promoting Knowledge Sharing



	Checked	% of respondents
Culture of asking others for help/advice	25	63 %
Culture of sharing information	20	50 %
Management support	17	43 %
A well known system for recording knowledge	7	18 %
High awareness of the KM process	6	15 %
Available time	5	13 %
None of the above	5	13 %
Monetary reward system	1	3 %
Recognition-based reward system	1	3 %

### Factors Motivating Knowledge Sharing



	Checked	% of respondents
Knowing it will be used	35	88 %
Time prioritized	18	45 %
Management voicing the importance of KM	12	30 %
Recognition	9	23 %
Co-worker evaluation system	9	23 %
Monetary rewards for recording good lessons	5	13 %
None of the above	0	0 %



### Coefficient of Determination

Facilitating Activity	Effectiveness	R <sup>2</sup>
Recording and sharing knowledge was part of my internal training	When I find lessons they are relevant and easy to understand	0,338
	I know what is expected of me in regards to recording knowledge	0,294
The organization has a clear and communicated goal with the knowledge management system	When I find lessons they are relevant and easy to understand	0,386
	I know what is expected of me in regards to recording	0,449
We have a defined process for using and recording lessons	I know what is expected of me in regards to recording	0,305
	When I find lessons they are relevant and easy to understand	0,348
	There is usually time to record lessons at the end of projects.	0,252
	I feel that my contribution of lessons influence project outcome	0,270
We have a reward system in place for recording knowledge	When I find lessons they are relevant and easy to understand	0,378
	I know what is expected of me in regards to recording	0,331
Informal sharing of past documentation from previous projects	The necessary information is easily obtainable	0,263
Use of templates	The necessary information is easily obtainable	0,327

### Comments

How to read the table:

First correlation: 30.5% of the variance in the variable “I know what is expected of me in regards to recording knowledge” can be explained by the variable “Recording and sharing knowledge was part of my internal training”.

These numbers indicates that there could be a positive relation between the variables, but due to the subjective nature of the data, a linear regression to explore the concrete relations will not be practically useful.

## Qualitative Data

Following the quantitative analysis, we designed a qualitative interview. We performed semi-structured phone-interviews with five individuals with administrative responsibilities within Faveo, as well as one project manager who were hired relatively recently. The interviews consisted of 20 questions (sub-questions included), and lasted between 25 and 75 minutes. With respect to the anonymity of the interview subjects, we have chosen not to directly transcribe the interviews, but rather explain the answers with our own words.

The purpose of the interviews was to further analyze findings from the quantitative analysis and attempt to find some underlying explanations. We also wanted to explore the awareness around knowledge management issues among managers in the firm, see if there was any difference among the various offices of the company and look for suggestions for improvement.

## Results

Due to the volume of interview results, they will be included in appendix 2. Analysis will be presented in the following chapter.

## Analysis and Discussion

In this chapter we will analyse and discuss the research findings in regards to theory, the known current state of Faveo and the results of the questionnaire and interviews. Note that specific recommendations to the case company based on the analysis will be in a later chapter.

### Strategy

One of the six focus areas in Faveo's strategy document for 2013-2016 is competency development. Their goal of being "the most attractive company for the competency development of project managers and consultants / specialists, enable to retain and attract the brightest people" as well as an initiative to "ensure knowledge transfer from experienced people to younger talents who can take this further" demonstrates their ambition regarding knowledge and competency development. Our opinion, however, is that the strategy is somewhat vague and gives little advice to employees as to what they should actually do. Nor does it have any readily measurable goals for monitoring goal achievement. This claim is somewhat supported by the quantitative data: when asked whether the organization has a clear and communicated goal with the knowledge management system, 75% disagreed or only somewhat agreed. This coincides with the 73% answering no or "don't know" to whether most projects has a knowledge management strategy.

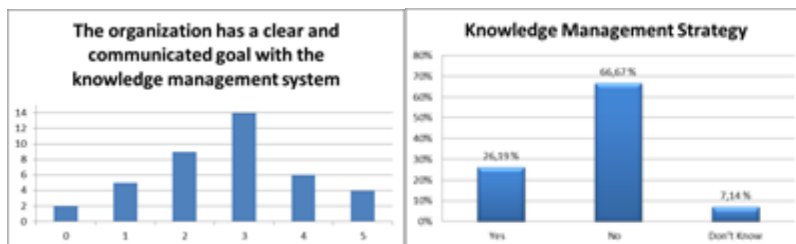


Figure 6: Quantitative Analysis: Knowledge Management Strategy

Interviews also reflected this view, as few reported knowing of any knowledge strategy. One participant knew about the knowledge sharing point in the strategy plan, and could also tell us that there was a more regional-specific action plan outlining, in their region, a desire to draw up a concrete plan for knowledge management during this year. This was however the only one we talked to with explicit knowledge about the strategy.

There was overall an agreement that knowledge is a critical aspect to Faveo's success, but there was mixed opinions as to how this should be done. One participant didn't know of any explicit strategy, and did not think there should be one; that focus should be on culture and voluntary sharing of information. Another compared Faveo to comparable knowledge based organizations, expressing those having a lot more structure on knowledge sharing and wishing the same for Faveo. The reason for the lesser focus on this in Faveo, however, was thought to be the much younger, less experienced workforce in those organizations.

Overall, there is an agreement in that Faveo should have a higher focus on explicit knowledge management, and we believe a strategy with measurable goals and more explicit measures to reach those goals could be beneficial to the organization.

## Organizational Culture

When analyzing the answers from the conducted interviews, it appears that informal sharing of knowledge is a central part of the culture in Faveo. It also became clear that people generally support this way of sharing knowledge and experience, and that it is also perceived as the most important one. This is also supported by the results from the questionnaire, regarding what employees feel is promoting knowledge sharing in the organization, as the two most significant factors were “Culture of asking others for help/advice” and “Culture of sharing information”. However, other results from the questionnaire indicate that employees generally agree that resources should be allocated to Knowledge Management and that they see a reason for recording lessons and experience.

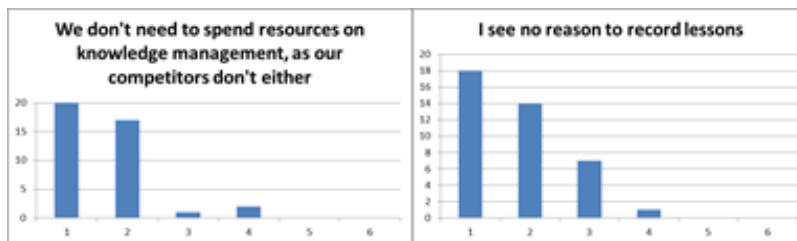


Figure 7: Quantitative Analysis: Organizational Culture

The explanation for this could be that, despite the fact that the employees support the informal sharing of knowledge in Faveo, and that this mechanism is a big part of their culture, they also see a reason to have a functioning formal knowledge system in place, as further discussed in the formal systems part of the analysis.

The reason why they value a formal system could be explained by their size and their geographical dispersion. One could imagine that, during years of growth, the organization has not been able to adapt the knowledge management system to the size of the organization, resulting in a system that is suited for a small organization, rather than to a relatively large dispersed one (Boh, 2007).

Theory mentions the organizational culture as potentially the largest barrier towards effective knowledge management. Given an overall negative attitude towards knowledge management in any given organization, addressing other barriers will not yield the desired results. As mentioned in the section above, the majority of employees in Faveo value a formal system that can be used to record and share knowledge. This is an indication that the employees have a positive perception of knowledge management, and other potential barriers should be addressed.

## Formal Systems

### Awareness and Effectiveness

One of our most important areas of focus has been the formal systems supporting knowledge sharing in Faveo. While some systems are in place, the extent of awareness and use of these systems vary greatly. In the initial questionnaire, we asked participants to state to what degree they agreed to the sentence “We have a defined process for using and recording knowledge”. While 17.5% agreed to this statement, the vast majority disagreed or only somewhat agreed. Further, when asked to list the most important factors currently hindering knowledge management in the organization, the highest ranking factors were the lack of a known system (63%) and lack of awareness of the knowledge management system (50%). This is further strengthened by as many as 25% reporting never having attempted to find lessons, and 29% not knowing about any lessons learned system.

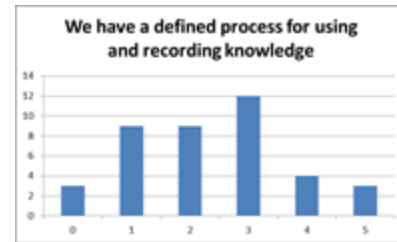


Figure 8: Quantitative Analysis: Defined Process

Results of this lack of a formal system materialize in the effectiveness measures of the knowledge management system. 82.5% only somewhat agree or disagree to knowing where and how to search for information. The same can be said for 75.6% in regards to whether necessary information is easily obtainable, and 85.4% to whether information they find is relevant and easy to understand.

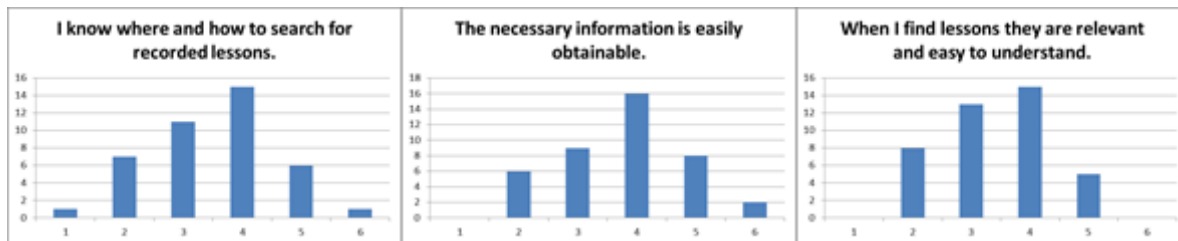


Figure 9: Quantitative Analysis: Effectiveness of the System

While not an uncommon problem according to previous research and partly a communications issue, this also clearly indicates an issue with the current formal systems - either because the systems themselves are insufficient, or because the awareness and use of them are lacking. This is further supported by the research of Rhodes and Dawson (2013), listing the introduction of an official knowledge management process and letting employees know when, where and how to record lessons and what is expected of them as an important facilitating activity.

From the correlation analysis, we found that defining a process for using and recording lessons and having it as a part of internal training and might positively impact employees knowledge of what's expected of them, as well as improving chances of them finding relevant information. It may also positively impact the perception of whether there is available time at the end of project to record lessons, as well as improving employees feeling that their contributions affect project outcomes.

## IT System

Faveo is using an information portal based on Microsoft SharePoint. As we unfortunately have not been able to gain access to the portal, we can only base the analysis on information given by research subjects.

The portal has been described as a toolbox containing project methodology, experience documents, laws and regulations, intranet and other project-related information, as well as personal pages with individual pages for highlighting competence (who knows what). This portal is being used by almost all projects, with some exclusion due to customer requirements or cases where some project managers are rented out to other companies and are thus using the clients system.

While the project methodology is the responsibility of the R&D director, everyone has access to add experience documents. However, our general impression is that very few does. Certain employees are responsible to quality control of added information. When the new system was implemented in 2011, valuable information from the older systems was transferred, and access to the old systems was removed. In this respect, Faveo are fulfilling the demands for the facilitating activities “Introduce an official software tool” and “Remove redundant systems”, however, the system does not seem to be working as efficiently as it could, as visible in the previous section.

Several research subjects report the personal SharePoint profiles with information about “who knows what” to be the knowledge activity with the highest focus. The way it works is that everyone has the responsibility of keeping their profile updated with keywords of their special areas of interest, and when looking for information you have to search the profiles to see if you can find someone with the knowledge you’re looking for. Feedback we have received indicates that the quality of the profiles and the update frequency varies greatly among employees. It is also very random and based on luck whether or not you find keywords you’re looking for when browsing profiles. This does not only affect the usability of the system: Subjects in the study done by Rhodes and Dawson (2013) reported that one of the main inhibitors of motivation was that the lack of a system where knowledge could easily be retrieved when needed crushed all motivation to spend time recording lessons. This is reflected in the reports from research subjects; they are aware that the IT system is not being used sufficiently.

We have also been told it’s possible to search for keywords in reports from other projects, looking for similar projects. This have by some reported to provide information, at least in the form of finding out who has experience from that project, but results are varying. Results from asking how participants benefited from information when they found something underline the benefit of information when it can be found.

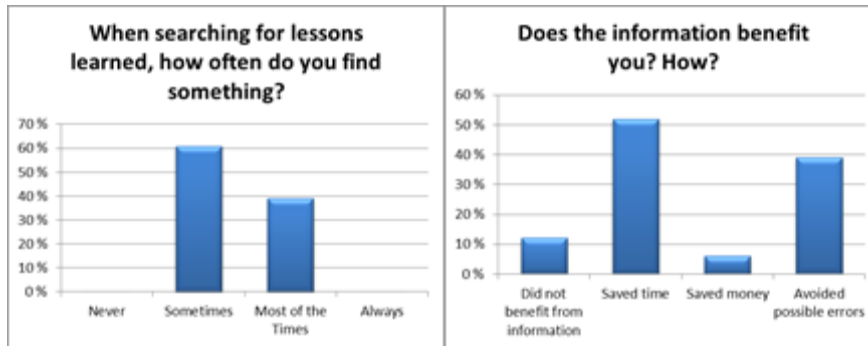


Figure 10: Quantitative Analysis: Benefits of Finding Lessons

During in-depth interviews we asked about the perceived usefulness of material in the SharePoint system. Results varied a lot, where some reported experience material to be highly tailored for practical purposes. Others claimed the information was too theoretical and not suited for real-life application, especially information made by Faveo Academy. A reason for this was mentioned to be that project managers are usually involved in the early stages of the project where everything is too uncertain to relate to something clearly defined. Then there were some who have tried searching for information, but never found anything useful.

When asked, participants were generally positive to an improvement of the system, especially for systematizing project experience. The system needs to be easier to use and it must be easier to find relevant information; better organization and higher user-level control and trying to create a system based on project needs. Some on the other hand would rather the internal training encompass the latest best practices and university material like new construction laws and standards, and not project experience.

A concern, however, is that “19 out of 20 systems I have heard about become too ambitious and complex, and thus fail. If we only include the most important items, we can improve. I worry we might be too ambitious if we’re making a change” (translated quote). Others felt that one flaw could be that the “best” employees who are able to fill their schedule with billable hours will be doing that, and those who can’t end up doing internal tasks like knowledge sharing, when it’s the “good” employees who really should be sharing their experience.

From the correlation analysis, we found that actively sharing past documentation from previous projects and using predefined templates might positively impact how easy it is to obtain necessary information.

Overall, the impression was that both usability and content in the current system could be better. One of the reasons for this could be a perceived attitude that employees are not sufficiently adding information to the system, and rather just end up using something they themselves have previously used. This is all coinciding with the findings of Lilly and Porter (2003) and Milton (2011), emphasizing easy retrieval of information and clear, quantifiable recommendations. It is further supported by Boh (2007) advocating institutionalized, formal systems for an organization such as Faveo. There’s a positive attitude towards improving the current system, however, with some varying views on what information is the most relevant.

## Faveo Academy

The main source of knowledge sharing in Faveo is Faveo Academy, which is responsible for gathering best practices and sharing it throughout the organization in the form of themed events, breakfast meeting and courses. There is also an annual conference for all Faveo employees. Some seminars are based on academic theories, others on project experience, or a mix of the two. Participation in Faveo Academy events is encouraged, but voluntary. We are however under the impression that participation is high due to high professional interest.

Everyone has access to contribute material for courses and theme nights. There are however no routines for doing this, and although this is the intention, our impression is that very few employees outside those responsible for Faveo Academy are actually contributing. Some even explained that they didn't think they had the opportunity to do so.

Some participants in our research expressed that there is often a mismatch between Academy lectures and practical application. They called for more of a translation and facilitation for practical purposes, both in content and presentation.

It seems like employees are satisfied with Faveo Academy as a mediator of academia and best practices, but a higher focus on practical application and participation from all employees could be used to improve the initiative.

## Operational Routines

### Knowledge Manager

Faveo do not operate with a knowledge manager in projects. They currently have an R&D director with the responsibility for knowledge management in the organization. An interesting observation is that 16.7% of participants of the survey claim they do have knowledge managers. There could be several reasons for this. Some explained that they considered this to be a part of the project manager's responsibility, others were unsure about the concept. This might indicate that roles and responsibilities in relation to knowledge management have not been sufficiently defined. Another view on the subject was that having a knowledge manager could be counterproductive; that a culture where everyone was responsible for knowledge retention was the optimal approach.



Figure 11: Quantitative Analysis: Knowledge Manager

Although our previous study (Amdam & Mækelæ, 2013) revealed a correlation between having a dedicated knowledge manager in projects and project success, this will most likely be in projects with several participants. Although there usually are in Faveo's projects, there will only be one or two Faveo employees on any given project. Having a knowledge manager in addition will probably not be productive.



### After-Action Review

The common conception is that there is an intention of performing this activity at the end of projects, although it has not been formalized or even done in most projects. There is a large agreement that this should be done and that there could be a high degree of learning from this activity. The barrier is however that time is not prioritized for this. Some claim the work pressure is too high, but by and large the consensus is that it's a matter of prioritization. A focus on billable hours and the desire to move on to the next revenue generating activity results in this activity being postponed and forgotten.



Figure 12: Quantitative Analysis: After Action Review

This is a common problem and in accordance with the findings of Pilsmo (2010): Lack of time or reluctance to performing the administrative task was not the issue. Subjects were positive to the process, but felt they missed a proper, fixed structure of doing it. Among our interviewees, several participants requested a formal point in the project methodology containing search for similar project at startup and a formal review at project close-up.

### Knowledge Audit

We have mixed impressions as to whether this activity is regularly performed. Although only 23.9% answered yes to this in the questionnaire, interviews gave us the impression that some form of knowledge audit, although under different names - is being performed in the front-end of most projects - at least major ones. An internal review of needed competencies and mapping of whether anyone has done a similar project previously, as well as a meeting with the client defining expectations for the delivery.



Figure 13: Quantitative Analysis: Knowledge Audit

The high number of negative answers to this, could be unfamiliarity with the term, but may also indicate a need for a higher formalization and focus on this area.

### Training

The answers from the interviews indicate that initial training of new employees is done through a 2-3 day long course in Oslo. The course includes training in relevant project management methods, as well as information regarding the formal knowledge sharing tools (SharePoint, Academy, and the who-knows-what register).

The answers also reveal that there is no clear consensus regarding the quality of the course, and that top management has expressed that the structure of the course should be evaluated. Further the results from the questionnaire indicate that recording and sharing knowledge was not a part of the training of the majority of employees (85% disagrees to some degree). This is supported by one of the answers from the interviews, stating that the course focuses mostly on the use who-knows-what register, and not on how to record knowledge.

Another interesting discovery during the interviews is the contradicting answers regarding the availability of the portal. One of the interviewees stated that it is possible to access the portal when conducting project work outside Faveo's locations, while another interviewee stated that this was not the case.

Relevant correlations were discovered between "Recording and sharing was part of my initial training" and "When I find lessons they are relevant and easy to understand", and "Recording and sharing was part of my initial training" and "I know what is expected of me in regards to recording knowledge". These correlations indicate that when recording and sharing of knowledge is a part of the training of an employee, he or she has a better understanding of what is expected of him in regards to record and share knowledge, and generally finds relevant and easy to read lessons more often.

The findings above indicate that information regarding knowledge management is not sufficiently covered in the initial training. This results in low awareness regarding how and why the formal system should be utilized. In addition, there are indications that information regarding the accessibility of the SharePoint platform has not been distributed sufficiently.

## Management Support

Previous theory mentions management support as a crucial barrier to overcome towards an effective knowledge management system. Without management support, there is small chance that time spent on knowledge management will be prioritized.

The perceived importance of management support is here indicated by the fact that this is one of the largest factors promoting knowledge sharing in the organization (43% of the participants). Management voicing the importance of knowledge management is also one of the largest factors regarding motivation to share knowledge (30% of the participants). This is an indication that management support is indeed an important factor.

When asking the participants of the questionnaire to what degree they agree with the statement "Top management actively supports spending time on knowledge management activities." the answer was relatively clear. While some disagree to this statement, the majority (75%) is on the positive side of the scale on this statement. This could indicate that management do in fact encourage spending time on knowledge management activities.

There are, however, results that indicate that support is not by itself sufficient, as 65% percent answered that they to some degree agree with the statement "Management wants us to record knowledge, but it does not work in practice". Answers from the interviews point towards lack of explicit expectations in regards to storing and sharing knowledge. One of the interviewees stated:

"One thing is to support it (spending time on knowledge management), another is to prioritize and facilitate these activities"

While a lot of employees feel that management is supporting spending time on knowledge management, the sections above indicate that this is a passive support rather than an active one. An explanation for why people feel that recording knowledge does not work in practice, could be the lack of (like the quote above states) facilitating activities and prioritization (active support). This is further supported through other participants, which mentioned another previous initiative that fell through due to lack of management support and marketing of the system. This is a perfect example of the importance of commitment on all levels to successfully implement a new system.

## Time and Opportunity Cost

This section deals with the priority between knowledge management and billable hours. In our theory chapter we saw that Pilsmo's (2010) findings indicate that although there is support from management to reflect and learn from past projects, there is a lack of prioritization of knowledge management activities. The participants in Pilsmo's study felt that they did not have sufficient time to reflect on the past, as a new project was already waiting for them.

When analyzing the results from the questionnaire, we found that 59% of the participants to some degree agree with the statement that there is usually time to search for lessons at the start of projects. Further, only 30% of the participants agree to some extent with the statement that there is usually time to record lessons at the end of projects. This could be an indication that there is in fact a "rush" to get started with the next project. This tendency is supported by some of the answers from the interviews. When asked about time to record and retrieve lessons, one of the interviewees answered:

"There is a conflict between the startup activities and the finalization of the projects"

There are however, some answers indicating that there could be some variation in available time between projects for some consultants. Another interviewee said:

"Another important issue is what people do with the time between projects"

Another interviewee stated:

"My perception is not that there is no lack of time (to retrieve and record lessons). It's a matter of prioritizing. [...] Storing lessons is all about prioritizing, but one lacks motivation at the end of projects."

These answers point towards two factors: motivation and prioritization. Some of the interviewees mentioned that the reason why these activities are not prioritized is because they're not billable.

Although there seems to be a variation regarding the time between projects for each consultant, there is an indication (deducted from the section above), that the majority of employees perceive available time as an existing barrier towards an effective knowledge management

system. This is supported by the fact that the most important factor currently hindering knowledge sharing in the organization is perceived to be available time (63% of the participants).

In light of our own findings, one might conclude that the findings of Pilsmo (2010) are not untypical in the PBO context.

## Motivation

### Reward System

When responding to the statement “We have a reward system in place for recording knowledge”, the majority (75%) responded negatively with only 7.5% agreeing to the statement. Interviews confirmed that Faveo do not have a formal motivation system in place for actively performing knowledge management activities. Generally, there seems to be somewhat an expectation of employees to participate in knowledge sharing, but there are neither demands nor concrete rewards for participating.



Figure 14: Quantitative Analysis: Reward System

Employees efforts in the company are yearly evaluated based on several criteria, including contribution to information exchange, engagement etc. Some concrete goals are often present, like creating a seminar or class on a given subject. A person who is active and stands out in regards to knowledge sharing, might be recognized and rewarded for the efforts, but this is very dependent on the leader in question and their focus on knowledge sharing. Our impression is that this is overall not given great focus. There does however seem to be a low threshold to participate in Faveo Academy courses and events and participation is high. Informal recognition of sharing knowledge is also perceived as high.

A barrier mentioned is that people in the organization have different payment, bonus and reward systems, and this could affect willingness to share information. Many report a perception that time spent on knowledge management activities are not valued as production time, and are thus prioritized below activities measured in production reports. Some have requested a change in regards to this - that maybe there should be some measurable key point indicators for quantifying knowledge work. As of now, revenue is the most valuable KPI, discouraging use of man hours “not being paid for”.

There are some indications that a concrete system might be beneficial. In the questionnaire, 62.5% agreed they would be more motivated to spend time recording knowledge if they were rewarded for it. The correlation study also pointed towards this, where we found correlations between agreeing to the statement “We have a reward system in place for recording knowledge” and the statements “When I find



Figure 15: Quantitative Analysis: Motivation

lessons they are relevant and easy to understand” ( $R^2=0,378$ ) and “I know what is expected of me in regards to recording” ( $R^2=0,331$ ). A point made by an interviewee was that “everyone wants information available when they need it; however, finding time to do it yourself is harder. A reward system might be useful in order to make employees spend time on it”.

There are several types of rewards, but the most common ones are monetary and recognition based. While several research subjects focused on knowledge management not being measured as production time in regards to employee evaluation (which determines salary, among others), most were negative to a monetary reward system. Difficulty of measuring it, a focus on quantity instead of quality as well as the individual payment schemes making comparison difficult, are difficulties mentioned in interviews. This would also require administrative resources keeping track of this system. In general, the opinion is that if implemented you would have to be very careful getting it right and making it fair. There are more pitfalls than advantages, and most subjects were negative to the idea. However, making knowledge sharing a part in the overall evaluation is welcomed.

A recognition based system has been generally more positively welcomed, although with some divided opinions. While some are positive to the idea of recognizing and giving focus to those excelling in the area, e.g. “knowledge sharer of the month”, other believe this is too simple to have any effect or that it will promote a too inwards focus in the organization.

From the correlation analysis, we found that implementing a reward system for recording lessons and clearly communicate the goals of the knowledge management system might also positively impact employees knowledge of what’s expected of them, as well as improving chances of them finding relevant information.

Although recognition is the main motivator in many aspects of life, it may have the reversed effect on the people not getting the recognition, causing jealousy and resentment towards the system. In fact, a study (Knocko, 2009) found a negative correlation between use of rewards to incentivize submission of lessons and satisfaction with the lessons learned system.

## Feedback

While 62.5% agreed to currently having a reward system, this is however not an astounding majority. The remaining 37.5% disagrees. When asked to list the most important motivational factors for knowledge management, knowing it will be used and time prioritized were listed as the most important factors.

	Checked	% of respondents
Knowing it will be used	35	88 %
Time prioritize d	18	45 %
Management voiding the importance of KM	12	30 %
Recognition	9	23 %
Co-worker evaluation system	9	23 %
Monetary rewards for recording good lessons	5	13 %
None of the above	0	0%

This underlines the value of prioritizing and valuing time spent on knowledge management activities, but also shows that the definitively highest motivator is knowing that what you're recording will be used. An initiative like this, where the system provides feedback how often your article has appeared in a search, someone has read it or even a "like" function have been positively mentioned by research subjects. Posting success stories from the use of recorded lessons might also have a positive impact.

This shows that although the majority agrees that motivation to spend time on knowledge management is often lacking and a reward system might improve this, there is great uncertainty as to how this should be done. While participants are skeptical to a monetary reward system, they would like knowledge management to be considered valuable production time, and a part of an overall evaluation. A recognition based reward system has received mixed feedback, but a way of getting feedback on your recorded lessons has been getting good responses. These findings are in accordance with those of Rhodes and Dawson (2013).

## Communication

Both in the initial phase and the maintaining phase of a new system, theory stresses the importance of communication. By continuously communicating the purpose and goals of the system throughout the organization, the risk regarding the utilization of it is reduced.

Regarding communication, three statistics from the questionnaire are relevant. For the first one: "Knowledge management is a recurring theme in our internal communications (newsletters etc.)", the majority of participants are centered around somewhat agree/agree (72.5%). The second statistic ("We have a defined process for using and recording knowledge.") show that the vast majority to some extent disagrees or only somewhat agrees (82.5%). Regarding the last relevant statistic, "I have read/heard several success stories from the use of our knowledge management system." the answers are widespread.



Figure 16: Quantitative Analysis: Communication

While it seems that knowledge management is a recurring theme in the organization, the answers from the interviews indicate that it these "reminders" regarding knowledge management are not that informative. The pattern of the answers from the interview are pointing towards that the organization barely informs their employees about a lesson learned system. This is supported by an interviewee stating that the system is not as central in their daily work life, as it could or should have been. Another interviewee expressed that the system needs to be made more visible and accessible.

The primary reason for these results could be explained by lack of management support. Without management stressing the importance of the system, and even worse not informing that there is such system, there is a high probability of failure. A second reason for the results in the sections above could be the lack of a defined process for using and recording knowledge. Without a specific routine for this activity, the risk that no one is using the system is increased. The reason for this could be explained by the problem of prioritization and billable hours which we discussed in the “Time and opportunity cost” part.

In addition to these results, we found two interesting correlations (expressed as the coefficient of determination).

<b>Dependent Variable</b>	<b>Independent Variable</b>	<b>R<sup>2</sup></b>
<b>Y.</b> The organization has a clear and communicated goal with the knowledge management system	<b>X1.</b> When I find lessons they are relevant and easy to understand	0,386
	<b>X2.</b> I know what is expected of me in regards to recording	0,449

The explanation behind the correlation between Y and X1 could be that when it is perceived that the organization has a clear communicated goal with the knowledge management system, the utilization of the system increases, which increases the number of lessons stored, and therefore increases the chance of finding relevant lessons. The second correlation (between Y and X2), indicates that there is a positive relation between communication of a specific goal for the knowledge managements system, and that employees know what is expected of them regarding recording of knowledge. The explanation behind this correlation could be that the employees that know of an explicit goal regarding the knowledge management system, also have a clearer picture of what is expected of them.

The analysis above indicates that there is a lack of communication regarding the knowledge management system. This shortage seems to influence the visibility, accessibility, and the utilization of the system.

### Temporary Organization of Projects

The temporary organization of projects is something most PBOs deal with, probably even more consultancy firms. This is also the case in Faveo. Employees are often hired out as staff to external companies or work alone as project managers. Sometimes two or more work on a project together, but our impression is that this is usually not the case. This is something several respondents have mentioned as a barrier to knowledge transfer. As they are usually alone, it is difficult to achieve any synergies from combined knowledge. Several mentioned more teamwork as something they miss from previous jobs.



This is usually a cost/benefit issue, as assigning two project managers to a job instead of one will naturally almost double the price, making it harder to compete for jobs. It can however also be largely due to the fact that Faveo have very few junior employees, which cost less and can thus be used in a team with a senior project manager.

### Individual Survival-Instinct

There are almost always some individuals that live by the belief that one might benefit more from holding information than sharing information with others. One of the key challenges is to incentivize sharing information instead of holding it.

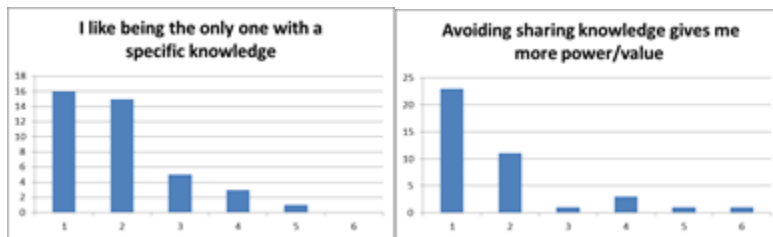


Figure 17: Quantitative Analysis: Individual Survival Instinct

The results from our questionnaire suggest that this is largely not the case in Faveo. This is also supported in interviews, where most mention a culture of sharing information and asking for help to be the strongest suits of Faveo. In a questionnaire, this is however an ego-challenging question - being asked to admit to being egocentric, and can because of this give skewed results in relation to actual employee behavior. A system of building your own competency and being responsible to "sell you own hours" may further increase this barrier.

Whether this is actually an issue in Faveo is very difficult to determine, but none the less, something that should be taken into careful consideration when designing and facilitating a knowledge sharing system.



## Conclusion

This section will address the conclusion regarding our research question and proposition. The same barriers that are presented in the chapter above will shortly be presented in this chapter, with relevant facilitating activities.

In the subchapters below, we will evaluate the most relevant facilitating activities up against each barrier and in this way see if there could be a relationship between them. At the end of the chapter, we will come to a conclusion whether our research question has been answered, and if our proposition is valid.

### Research Question

How does the theoretical connection between facilitating activities and knowledge management success match observed conditions in the case company?

### Proposition

Facilitating activities counteract barriers to successful knowledge management in project based organizations.

<b>Barriers</b>	<b>Relevant facilitating activities</b>
Organizational Culture	
Formal Systems	<ul style="list-style-type: none"><li>● Remove redundant systems</li><li>● Introduce an official software tool</li><li>● Allocate time to maintain the system</li></ul>
Management Support	<ul style="list-style-type: none"><li>● Overcome time barriers</li><li>● Introduce an official knowledge management process</li><li>● Define and communicate knowledge management intent</li></ul>
Time and Opportunity Cost	<ul style="list-style-type: none"><li>● Overcome time barriers</li></ul>
Motivation	<ul style="list-style-type: none"><li>● Motivation (rewards)</li><li>● Publish success stories from using the system</li><li>● Market the process</li></ul>
Communication	<ul style="list-style-type: none"><li>● Market the process</li><li>● Define and communicate knowledge management intent</li></ul>
Temporary Organization of Projects	<ul style="list-style-type: none"><li>● Overcome time barriers</li></ul>
Individual Survival-Instinct	<ul style="list-style-type: none"><li>● Define and communicate knowledge management intent</li></ul>

## Organizational Culture

It is difficult to find any facilitating activities that influence the culture of the organization directly. Our findings indicate that informal sharing is highly valued in Faveo, and is perhaps the most utilized sharing mechanism. The majority of employees also seem to understand the importance of formal mechanisms for sharing. Thus, the culture of Faveo does not seem to be a barrier that is present.

## Formal Systems

There are several facilitating activities that are relevant for this barrier. First, removing all redundant systems should be done to avoid confusion. Our findings indicate that this has been achieved, as employees are pretty clear on what formal systems that are present in the organization.

Introduce an official software tool is the second activity. As mentioned in the section above, this has been achieved. This activity is also about usability (making searching and storing of lessons as easy as possible). In the analysis and discussion chapter we found that the usability of the system (mainly SharePoint) was not optimal.

The third and last relevant facilitating activity is to allocate time to maintain the system. The goal of this activity is to ensure the usability of the system, as well as the quality of the content within the system. Faveo has certain employees that are responsible for the quality of added lessons or other relevant material in the portal. However, it seems that the usability of the system has some potential for improvement.

When taking all of the above mentioned facilitating activities into account, and adding the fact that the usability and content of the formal system could be improved, we can't exclude the possibility that the relevant facilitating activities has an impact on the formal system as a barrier.

## Management Support

The first relevant facilitating activity regarding the barrier of management support is to overcome time barriers. This activity addresses the need to have a planned knowledge management process, as well as the need for prioritization of knowledge management. Theory states that in order to optimize this activity, management support is crucial. In the analysis of management support we found that the management has a passive way of supporting knowledge management, and that there are no explicit expectations in terms of use of the knowledge management system. Without an active support from management, any knowledge management process will potentially be neglected.

The second relevant facilitating activity is to introduce an official knowledge management process, that states when, where, and how to record lessons. In the subchapter "Awareness and Effectiveness" under our analysis and discussion chapter, we found that this activity seems to be absent.

To define and communicate the knowledge management intent is the last relevant facilitating

activity. That is; a clear statement of intent that enables everyone to be committed to the same objectives. Under the section termed “Strategy” in our analysis chapter, we found that the focus area that addresses knowledge management is generally vague, and lacks measurable objectives. In addition, few reported that they knew of such a strategy/focus area.

All of the relevant facilitating activities are either to a small extent present, or absent in the organization. Having earlier in the analysis chapter concluded that management support seems to be a barrier, we can’t exclude the possibility that the relevant facilitating activities have an impact on management support as a barrier.

### Time and Opportunity Cost

To overcome time barriers is the relevant facilitating activity regarding time and opportunity cost. In the “Time and Opportunity Cost” section in the analysis chapter, we found that prioritization of knowledge management was to a very small extent present, both from an employee perspective as well as from a management perspective.

The fact that this activity seems to be almost absent, and that we found evidence that points towards the prioritization of billable hours and project progress in favor of knowledge management, we can’t exclude that to overcome time barriers has an impact on time and opportunity cost.

### Motivation

As stated in theory, motivation is a rather wide term. In our case, it is divided into internal motivation and external motivation. Regarding the former type of motivation, the facilitating activities “Publish success stories from using the system” and “Market the process” were the ones that we view as the most relevant. Regarding the latter motivation type, the facilitating activity “Motivation (rewards)” is the most relevant. We will start of by talking about the internal motivation, and then move on to the external motivation.

When analyzing the facilitating activity “Publish success stories from using the system” we found that the perceptions of the employees were mixed. This point towards this activity being, to a certain degree, present in the organization. Further the activity “Market the process”, which essentially focuses on communicating the achieved benefits of the knowledge management system, was found to be more or less absent (management support was found to be passive).

External motivation seems to be absent in the organization. There is virtually no evidence that points towards a system that rewards the employees with either monetary bonuses or recognition.

The overall motivation in the analysis part was found to be to a large degree absent. We have no basis to state that there is no relationship between the relevant facilitating activities, and the barrier of motivation.

## Communication

The most relevant facilitating activity regarding communication is “Define and communicate knowledge management intent”. This activity is all about having a clear and communicated statement of intent regarding why the knowledge management should be prioritized.

We found that the strategy regarding knowledge management was relatively vague, as it had few measurable goals. We also found that few of the participants knew of this part in the strategy plan.

When analyzing the communication in the organization, we concluded that there is a lack of communication regarding the knowledge management system, which seems to influence the visibility, accessibility, and the utilization of the system. Therefore, we can’t exclude that the relevant facilitating activity has an impact on the barrier of communication.

## Temporary Organization of Projects

“Overcome time barriers” is naturally the facilitating activity that is closest connected to the barrier of temporary organization of projects. We found that there is currently no clear and defined process for knowledge management.

Regarding the challenges related to the temporary nature of projects, we found that the organization often uses one consultant in each project, making it even more important that there is some kind of formal process at the end of a project that captures the acquired knowledge. We also found that there is usually a small amount of time between projects, making employees “run” from one project to the next.

Having a defined process, and thus make knowledge management a prioritization, could increase the reflection time between projects. We can’t exclude that there is a relationship between the facilitating activity and the barrier of temporary organization of projects.

## Individual Survival Instinct

The two most relevant facilitating activities towards lowering the barrier regarding the individual survival instinct are “Define and communicate knowledge management intent”, and “Overcome time barriers”. We have discussed the presence of these activities in previous sections, and concluded that they are to a low degree present in the organization.

When analyzing this barrier, we found that it is currently not an issue, as the culture of Faveo has a natural focus on sharing knowledge. However, there is a risk of skewness in the answers, as it could make one seem egocentric. It’s therefore hard to reach a conclusion in this section.

## Conclusion and Implications

In this section we will evaluate if our research question has been answered, and if our proposition holds.

In this thesis, we have aimed to test if the theoretical connection between proposed facilitating

activities and knowledge management success matches the observed condition in the case company. After analyzing the gathered evidence, it is fair to say that the knowledge management system in Faveo has room for improvement. Adding the fact that the majority of the theoretical facilitating activities are absent, or to a small degree present in the organization, it seems that there could be a relationship between the two relevant items.

Our proposition stated that facilitating activities counteracts barriers for successful knowledge management success in project based organizations. In the sections above we evaluated the most relevant facilitating activities up against each barrier. The overall conclusion is that although facilitating activities do not always necessarily counteract barriers to successful knowledge management, we found a relatively high correlation between the absence of facilitating activities and the presence of barriers.

## Recommendations for the Case Company

In this chapter we will make some recommendations to the case company. While it is difficult to draw any clear conclusions in a study like this, we have seen some patterns indicating opportunities for improvement. These recommendations are based on theory from previous studies, results from the questionnaire, answers to interviews and some ideas generated through discussion among the authors of this thesis.

### Strategy

A common concern regarding this kind of activity, which is not directly value driven, is that it's seen as "another administrative process that needs to be done". However, Pilsmo (2010) found with his interviewees that this was not the case: They were positive to the process, but felt they missed a proper, fixed structure of doing it. Similarly, subjects in the study done by Rhodes and Dawson (2013) reported that one of the main inhibitors of motivation was that the lack of a system where knowledge could easily be retrieved when needed crushed all motivation to spend time recording lessons.

Two important facilitating activities mentioned by Rhodes and Dawson (2013) are "Introduce an official knowledge management process: Let employees know when, where and how to record lessons and what is expected of them" and define and communicate knowledge management intent:

"A clear statement of intent enables everyone to be committed to the same objectives and to visualize what is trying to be achieved through the use of lessons learned and what priority this is given. The statement should be embedded in whatever official documentation and training produced by the organization".

Our opinion is that the knowledge-related strategy of Faveo is somewhat vague and gives little advice to employees as to what they should actually do. Nor does it have any readily measurable goals for monitoring goal achievement.

One interviewee mentioned a regional-specific action plan outlining, in their region, a desire to draw up a concrete plan for knowledge management during this year. We have not been able to obtain this document, so we cannot conclude with anything regarding this. However, if this plan does in fact outline a concrete, measurable plan for the knowledge management processes, this should be on an organizational level in order to obtain synergies between regions.

We believe Faveo could benefit from having a higher focus on explicit knowledge management. A strategy with measurable goals and distinct measures to reach those goals, guiding employees in everyday activities can promote this intention.

## Organizational Culture

There is a high support for the informal sharing of knowledge in Faveo, and this mechanism is a big part of their culture. Research subjects, however, also see a reason to have a functioning formal knowledge system in place that can be used to record and share knowledge. This is an indication that there is a positive perception of knowledge management in the organization, and we do not see a need to recommend any specific initiatives for improving organizational culture.

## Formal Systems

When rating agreement to the questionnaire statement “We have a defined process for using and recording knowledge”, the vast majority (82.5%) disagreed or only somewhat agreed. Further, when asked to list the most important factors currently hindering knowledge management in the organization, the highest ranking factors were the lack of a known system (63%) and lack of awareness of the knowledge management system (50%).

Our impression is that the majority of knowledge sharing in Faveo happens through informal means such as word of mouth sharing and personal networks. These individualized sharing mechanisms are very suitable for small, collated organizations, as they increase the responsiveness and flexibility of the organization. They are however reliant on whether employees happen to speak to the right person at the right time (Boh, 2007).

Faveo however, has become relatively large and also very geographically dispersed. According to Boh (2007), they could therefore benefit of enhancing their institutionalized knowledge sharing mechanisms. Knowledge sharing at the institutionalized level is often formal and embedded in organizational routines. It enables the transfer of knowledge from an individual to a large number of individuals, and enables the organization to “push” out information, rather than rely on employees to “pull” it themselves.

An argument often used by research subjects is that every project is somewhat unique, and therefore templates and standardized methods would not work. This is in agreement with previous research regarding institutionalized-codification mechanisms, and we will therefore suggest Faveo focus on institutionalized-personalization mechanisms. This knowledge is often closely tied to the person who developed it and shared mainly through direct person-to-person contact. This has the advantage of allowing the knowledge to be adapted to the specific situation. It also has the inherent flexibility of transmitting tacit knowledge - allowing for discussions and sharing interpretations that may lead to the development of new knowledge.

Common mechanisms include:

- Mentoring programs
- After-action reviews
- Having a common project director shared across projects
- Cross-staffing across projects
- Communities of practice
- Performing a knowledge audit
- Yellow Pages: A searchable database of who knows what

Finally, when designing a formal system, we would like to promote Milton's (2005) three different stages of project knowledge management:

1. Learning at the *start*: You gather knowledge from previously recorded lessons, enabling you to begin the project in a state of complete knowledge.
2. Learning *during* the project: Gathering and distributing knowledge during project execution allows you to change the plans and create new ones based on newfound knowledge.
3. Learning at the *end*: Here's the part most people think of when confronted with knowledge management questions. At the end of the project you gather all knowledge accumulated during the project and enable future use.

## IT System

### *Personal Profiles*

While the current SharePoint based system is well implemented, it does not seem to work as well as it could. Currently, there is a high focus on the personal profiles, which according to Boh (2007) could be very well suited to the needs of Faveo. We would however like to suggest an important improvement. The "ask me about this" section in the personal profiles needs to be systematized and categorized by i.e. picking skills from a drop-down menu of keywords in order to be searchable. Otherwise it is very difficult to know exactly what keywords people are using, and thus leave the one wanting information to the cumbersome process of browsing through hundreds of profiles in the hopes of finding someone with the desired qualifications.

### *Experience Database*

While the database of profiles enables easy contact with personnel with experience, it does not retain information within the organization, as the information disappears when people leaves. This promotes the use of an experience database. When asked, participants were generally positive to an improvement of the system, especially for systematizing project experience. Some on the other hand would rather the internal training encompass the latest best practice and university material like new construction laws and standards, and not project experience.

A way of handling this could be having Faveo Academy responsible for best practices, university material, as well as updated laws and standards, while the project experience database is more user-controlled. Note that there still should be someone responsible for maintaining and quality-checking recorded experience documents.

Lilly and Porter (2003) found that if an organization is going to use a database, it is important that the lessons learned should be easy to retrieve in order to facilitate actual later use of the database and the lessons recorded. Further Milton (2011) specifies that when a lesson is written, it needs to be clear, quantified and written as a recommendation.

It is further important that there is a defined process for recording, to ensure participation. A potential pitfall could be that the "best" employees who are able to fill their schedule with billable hours will be doing that, and those who can't end up doing internal tasks like knowledge



sharing, when it's the "good" employees who really should be sharing their experience.

We would also like to recommend an indexing system for recorded lessons, e.g. by client, industry and other keywords (turnaround project, public procurement etc.), and possibly an option to subscribe to lessons within chosen industries to have them accentuated or sent by email.

### *Forum-Based Exchange*

Newell et al. (2004) found that ICT had not been a very effective measure for knowledge sharing. However, knowledge shared through social networks had been successfully used to a higher degree. This knowledge can be used to the organization's advantage, by using proven mechanisms from social networks in organizational communication.

One way of implementing this could be a forum-feed, where employees can ask questions, and later give "likes" to relevant answers given by colleagues. Such a simple system could give several advantages:

- Ease informal knowledge sharing by allowing access to the entire organization when asking a question.
- Provide a form of knowledge retention, by keeping forum posts searchable for later use.
- Provide basis for Faveo Academy training, by quantifying what type of questions are being asked most frequently, highlighting a need for training.
- A way of quantifying knowledge sharing participation, by easily counting number of answers posted, with emphasis on posts receiving "likes" to ensure quality over quantity.

An absolutely vital aspect, however, for such a system to be successful, is making it visible and easy to use. The forum-feed should be dedicated a large area of the SharePoint front page to make sure questions are actually seen by everyone. If it is hidden away in a menu where you actively have to seek it out, questions will not be seen and the system will be forgotten. Similarly to the experience database, these forum posts could be indexed by client, industry etc. to improve searchability for later use.

### *Faveo Academy*

Some participants in our research expressed that there is often a mismatch between Academy lectures and practical application. They called for more of a translation and facilitation for practical purposes, both in content and presentation.

It seems like employees are satisfied with Faveo Academy as a mediator of academia and best practices, but a higher focus on practical application and participation from all employees could be used to improve the initiative - unless a division as suggested previously is to be used.

## Operational Routines

### *Knowledge Manager*

Although we have previously found a correlation between the use of a dedicated knowledge manager in projects and project success (Amdam & Mækela, 2013), this has probably been in projects with several participants. As Faveo usually operate with one or two employees on each project, knowledge management has to be the responsibility of each project manager.

Alternatively, if one is to have a common project director shared across projects, as suggested by Boh (2007), knowledge management might be a natural area of responsibility for this person.

### *Knowledge Audit*

The high number of negative answers to this could be due to unfamiliarity with the term, but may also indicate a need for a higher formalization and focus on this area. We believe entering this as a formal activity at the start of each project would be beneficial to the organization.

### *After-Action Review*

There is a large agreement in Faveo that this should be done and that there could be a high degree of learning from performing this activity. The barrier is however that time is not prioritized for this. A focus on billable hours and the desire to move on to the next revenue generating activity results in this activity being postponed and forgotten.

We recommend adding this activity as a checkpoint in the project methodology - something that is prioritized and must be performed at the end of each project. This could counteract the perception of not having the time available for this activity.

### *Client Feedback*

In addition to the after-action review, client feedback can be a useful tool for learning. This can be done e.g. by using a survey. If not satisfied, determine what went wrong and communicate this within the organization in order to prevent repeating old mistakes. If everything went well, did we do anything different than usually? If so, communicate this for later replication.

## Training

When asked whether recording and sharing knowledge was a part of their internal training, the majority of employees (85%) disagreed to some degree. However, in our correlation study, we found that those who reported recording and sharing knowledge as part of training, to a higher degree also knew what was expected of them in regards to recording knowledge, as well as finding more relevant lessons. This indicates that including this more in training could give positive results. We would therefore recommend focusing more on recording and sharing knowledge in the initial training course, as well as holding refreshing courses for existing employees.

## Management Support and Time and Opportunity Cost

Pilsmo (2010) found in his research that while the management were promoting and encouraging the employees to reflect on acquired knowledge, the consultants claimed that not enough time were provided to the task. This because there were always another project needing the resources. This also appears to be true for Faveo. The majority of employees

perceive available time as an existing barrier towards an effective knowledge management system.

Rhodes and Dawson (2013) have explained this as one of the most important barriers to effective knowledge management. In order to overcome time barriers, knowledge management processes must be planned and prioritized. In order to achieve this, management support is crucial.

Higher awareness among management regarding this issue is needed. It is not enough to not discourage time spent on knowledge management. It must be planned, prioritized, actively encouraged and counted as “productive time”.

## Motivation

### Reward system

An important barrier mentioned by research subjects is that people in the organization have different payment, bonus and reward systems, and this could affect willingness to share information. Further, 62.5% agreed they would be more motivated to spend time recording knowledge if they were rewarded for it.

The first issue is important. If each individual is rewarded not by the organization as whole doing well, but based on individual results, this could discourage helping others. To counter this, we would propose a profit sharing system. This could increase motivation to improve the organization as a whole.

Further, while having a reward system, monetary or recognition based, directly linked to knowledge sharing participation is discouraged both theoretically (Knocko, 2009) and based on interview feedback, maybe there should be some measurable key point indicators for quantifying knowledge work. As of now, revenue is the most valuable KPI, discouraging use of man hours “not being paid for”. This could be measured by e.g. counting reply posts as previously mentioned in the Forum-based Exchange subchapter.

Making knowledge work participation a part in the overall employee evaluation was welcomed by respondents and something we will recommend.

### Feedback

The definitively highest motivator discovered in this study is knowing that what you’re recording will be used. An initiative like the forum-based exchange previously mentioned, where the system provides feedback how often your article has appeared in a search, someone has read it or when it receives a “like” have been positively mentioned by research subjects and is something we recommend implementing.

Posting success stories from the use of recorded lessons might also have a positive impact. This can be done for example by having the one who asked a question in the forum finally

posting how the information obtained helped him/her and how. Especially good success stories can be used in internal newsletters or similar.

## Communication

Both in the initial phase and the maintenance phase of a system, theory stresses the importance of communication. By continuously communicating the purpose and goals of the system throughout the organization, the risk regarding the utilization of it is reduced. When perceived that the organization has a clear and communicated goal with the knowledge management system, the utilization of the system increases, which increases the number of lessons stored, and therefore increases the chance of find relevant lessons.

The pattern of the answers from the interviews are pointing towards Faveo barely informing their employees about a lesson learned system. As much as 29% do not know of a lessons-learned system in the organization. This is a quite significant sign of lack of awareness around the subject.

Rhodes and Dawson (2013) provide two facilitating activities for active communication, and this is something Faveo would benefit from giving a higher focus:

- Market the process
  - All achieved benefits from the system must be published in order to provide continuous encouragement. This should be done through newsletters, notice boards and whatever other means of communication the organization uses. Some of this information should be aimed at team leaders as this will further instil confidence, as team members can see their management advocating lessons learned.
- Publish success stories from using the system
  - Employees must see the benefits of their actions. Publishing success stories from using the system will encourage contributors, as they can see recorded lessons are being useful.

## Temporary Organization of Projects

The temporary organization of projects is something several research subjects have mentioned as a barrier to knowledge transfer in Faveo. As they are usually alone on a project, it is difficult to achieve any synergies from combined knowledge. Several mentioned more teamwork as something they miss from previous jobs.

While the “make or buy competence” is a strategic decision somewhat outside the scope of this thesis, having more junior employees which cost less and can thus be used in a team with a senior project manager is something we would encourage for the future.

## Individual Survival-Instinct

The results from our questionnaire suggest that this is largely not an issue in Faveo. This is supported by the interviews, where most mention a culture of sharing information and asking for help to be one of the strongest suits of Faveo.

A system of individual competency plans, building your own competency and being responsible to “sell you own hours” may however increase this barrier in the future.

## Limitations

In this section we will evaluate our results and methods by using the concepts of validity and reliability, starting with the internal validity, followed by construct validity. Further we evaluate the reliability of our research and finish with a reflection of the external validity.

The case study method is generally weak when it comes to internal validity. The fact that we did not have control over behavioral events, forced us to formulate the analysis and its conclusion in a rather vague manner.

Regarding the construct validity, we consider it to be relatively strong. Constructs as “Facilitating Activities” and “Barriers” were based on previous articles, and included multiple items that reflected them (communication, organizational culture, formal system, etc.).

The reliability of the research was preserved by constructing a database containing raw data from the questionnaire. The interviews were not transcribed word by word, but rather in a summarized manner. This was done to save time, but does of course influence the quality of the research.

Our case study protocol increases the strength of both the reliability and the construct validity of our research by including detailed procedures of data collection and analysis, as well as our questionnaire and interview agenda.

When evaluating the external validity of our thesis, it is natural to evaluate if our results are analytically generalizable (and not statistically generalizable). It is likely that similar organizations in a similar context as Faveo could benefit from the recommendations in the previous chapter.

As inexperienced case study researcher, there is also an increased risk of common research biases.

## Further Research

This is a field of study in which we still have much to learn. A quantitative study using several organizations in different fields and possibly several countries, looking at the connection between facilitating and knowledge management success could further explore this relationship.

Another possibility which might prove difficult to organize, would be a case study in which the researcher follow several organizations through a change process in which they implement facilitating activities and study the presence of barriers before and after implementation.

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## Appendix 1: Case study protocol

### Preamble

The purpose of this protocol is to operationalize our research procedures by describing the origin of our research question and proposition, how and when relevant contacts were made, the research instruments we utilized, and the data analysis procedures we used.

The thesis, and the documents related to it, was at all times saved on two separate and independent digital units.

### General

This paper represents our master thesis at the Norwegian university of science and technology (NTNU). The thesis is an extension from a previous project (Amdam and Mækelæ, 2013), and is a part of our further specialization within the field of knowledge management in projects. The official starting date of the thesis was 15.01.2014, and is to be submitted before 11.06.2014. The purpose of this paper is to test different theories from previous research, with the observed condition in a case company.

#### **Research question:**

How does the theoretical connection between facilitating activities and knowledge management success match observed conditions in the case company?

#### **Proposition:**

Facilitating activities counteract barriers to successful knowledge management in project based organizations.

Our research question and proposition are extracted from different theories from the writings listed below.

#### **Relevant readings:**

Dunford, R., 2000. Key challenges in the search for the effective management of knowledge in management consulting firms, *Journal of Knowledge Management* 4(4): 295-302

Newell, S., Tansley, C., Huang, J., 2004. Social Capital and Knowledge Integration in an ERP Project Team: Importance of Bridging and Bonding. *British Journal of Management* 15(S1): 43-57.

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## Procedures

After the official start of the master thesis, we contacted several potential case companies. The criteria for contacting a firm were:

1. It has to be a PBO.
2. It preferably has a department in Trondheim.
3. It preferably sells consultancy services.

The first criterion is essential since it is a part of our research question. The second and the third criteria are preferred once, but not necessary. A local company (criteria nr. 2) is advantageous since the researcher can more easily conduct face to face interviews. Since the main theme in the thesis is knowledge management, and consultancy firms are highly dependent on knowledge, it is preferred (but necessary) that the case company sells consultancy services.

In our case, all the criteria were present. Although our case company had a department in the same city as our university, we did not conduct any face to face interviews during our data collection. All our interviews were conducted via telephone, as meeting face to face with the interviewee could compromise the anonymity of the interview object.

Before conducting the telephone interviews, we first contacted the relevant employees via telephone and asked them if they were willing to participate in an interview lasting approximately one hour. After their consent, we sent them an interview notice via email. The email contained the agreed date and time of the interview, as well as a interview agenda, with topics that we intended to bring up during the interview.

Our case study procedure:

- Start writing theory and methodology.
- Finnish theory development.
- Based on the theory, develop an questionnaire.
- Get email addresses for all relevant employees.
- Distribute the questionnaire.
- Analyze the results from the questionnaire by deriving basic statistics and correlations (done in MS Excel).
- Use the derived data from the questionnaire to construct an interview.
- Contact relevant interview objects, by following the procedure described earlier.
- Conduct the interviews by using the following tools:
  - A telephone with loudspeaker function.
  - A tape recorder.

One important thing to notice, regarding the conduction of the interviews, is that the researcher has to get the approval of the interviewee to record the conversation. Naturally, this agreement has to be done at the start of the interview.

## Research instruments

To get a sufficient overview of the facilitating activities present in the case company, and to map out the main mechanisms in their knowledge management system, we plan to do two things. First, we want to get an overview of these activities by using a questionnaire that will be distributed via mail. We will use the questionnaire tool available through our university (link: <https://survey.svt.ntnu.no/Login.aspx>). The choice of online questionnaire tool was purely based on the fact that we can utilize this tool for free. The main focus when choosing a questionnaire tool is that it has to include a function that converts the raw data to MS Excel. By converting the questionnaire data to MS Excel, we plan to do a simple correlation analysis.

## The Questionnaire

### Info

This questionnaire is a part of a case study on facilitating activities for knowledge management success in project based organizations, with X as chosen case company. The study is a part of a master thesis for MSc in Project Management at NTNU.

Deadline for answering: xx.xx.xx

Time needed to answer: ~5 minutes.

Answer form: Multiple choice with some options to elaborate.

The questionnaire is anonymous. Answers will be used only for this study and will not be shared with any third party.

All questions are written in English, but feel free to answer optional text boxes in Norwegian or English.

**Definitions:**

Knowledge:

Collection of facts, information and skills acquired through experience or education; the theoretical or practical understanding of a subject.

*Norsk: Kunnskap*

Knowledge Management:

Strategies and processes designed to identify, capture, structure, value, exploit and share an organization's intellectual resources.

*Norsk: Kunnskapsforvaltning/kunnskapsledelse*

Knowledge Audit

A qualitative evaluation attempt to determine:

- Which knowledge the organization/project require.
- Which competencies and resources are currently present in the organization, and where.
- Which gaps in competencies are currently in the organization.
- Mapping of the flow of competencies in the organization, and determine barriers to this flow.

*Norsk: Kompetanseevaluering*

Lessons Learned System

A database or forum of searching for previously recorded lessons learned in projects. Either with lessons directly recorded in the database, or as a yellow pages of "who knows what" in the organization.

**General**

Age

Years of Project Experience

Do you know of a lessons-learned system existing in the organization?

Have you ever attempted finding lessons learned in the organization?

IF yes:

When searching for lessons learned, how often do you find something?

Does the information benefit you? How?

**Activities (1-6)**

*Rate your level of agreement with the following statements:*

*(Strongly agree / Agree / Somewhat Agree / Somewhat Disagree / Disagree / Strongly Disagree)*

Knowledge management is a recurring theme in our internal communications (newsletters etc.).

I have read/heard several success stories from the use of our knowledge management system.

Recording and sharing knowledge was part of my internal training.

Top management actively supports spending time on knowledge management activities.

The organization has a clear and communicated goal with the knowledge management system.

We have a defined process for using and recording knowledge.

We have a reward system in place for recording knowledge.

*Rate the use of the following activities within the typical project in the organization:  
(Never / Once / About Every other month / Monthly / Weekly / Daily)*

Mentoring (helping and learning relationship between a senior (mentor) and a less experienced person.)

Storytelling (stories about past successes or failures)

Informal sharing of past documentation from previous projects.

Manuals written voluntarily.

Super users within a specific field of work as a support function.

Cross Staffing across projects.

Use of templates (documents, procedures etc.)

Broadcast of emails and use of forums.

Yellow Pages: A searchable database of who knows what.

Knowledge database: Searchable database of multimedia (text, video, images, etc.) that contains experiences and know-how.

Identification and sharing of “best practices” in the form of instructional manuals, how-to guidelines and other information.

*Are these activities / functions present in most projects?*

*(Yes / No)*

Knowledge Manager (a person responsible for knowledge management process).

A defined and written knowledge management strategy.

After Action Review / project debrief with lessons learned.

Knowledge Audit / evaluation of the competencies present in the organization.

If any other systems for sharing knowledge are present in the organization, please describe them briefly. (Optional)

### **How well does it work (1-6)**

*When taking part in projects in the organization, to what degree do you agree with the following statements?*

*(Strongly agree / Agree / Somewhat Agree / Somewhat Disagree / Disagree / Strongly Disagree)*

The necessary information is easily obtainable.

I know where and how to search for recorded lessons.

When I find lessons they are relevant and easy to understand.

I know what is expected of me in regards to recording and utilizing lessons learned.

There is usually time to search for lessons at the start of projects.

There is usually time to record lessons at the end of projects.

I feel that my contribution of lessons influence project outcomes.



## **Motivation (1-6)**

*Rate your level of agreement with the following statements:*

We don't need to spend resources on knowledge management, as our competitors don't either.

I see no reason to record lessons; they are not being used anyway.

I like being the only one with a specific knowledge.

Avoiding sharing knowledge gives me more power/value.

Management wants us to record knowledge, but it does not work in practice.

I would be more motivated to record knowledge if I knew I was rewarded for it.

*What do you feel is currently hindering knowledge sharing in the organization?*

(multiple checkboxes)

Lack of management Support

Lack of awareness of the knowledge management process in the organization

Available time

Lack of a known system for recording knowledge

Culture of not sharing information

Lack of a monetary reward system

Lack of a recognition-based reward system

Culture of not asking others for help/advice

The temporary organization of project groups

Other (textbox)

*What do you feel is currently promoting knowledge sharing in the organization?*

(multiple checkboxes)

Management support

High awareness of the knowledge management process in the organization

Available time

A well known system for recording knowledge

Culture of sharing information

A monetary reward system

A recognition-based reward system

Culture of asking others for help/advice

Other (textbox)

*What is crucial in motivating you to spend time recording lessons learned?*

(multiple checkboxes)

Knowing it will be used.

Management voicing the importance of knowledge management.

Monetary rewards for recording good lessons.

Recognition (e.g. "knowledge sharer of the month").

Co-worker evaluation system (based on helpfulness)

Time prioritized and earmarked for recording lessons.

## Interview

The second data collection method is interviews. Our Interview questions are based on the answers from the questionnaire, and are presented in a semi-structured manner. In addition to the questions, we added some statistics extracted from the results of the questionnaire. This was very useful as we could present the interviewees with relevant statistics, and in this way get their perspective on why these results occurred.

The interview objects should be persons with a good overview of the routines and activities in the organization (preferably in a management position). The interviews are constructed to last approximately an hour. We conducted the interviews through telephone, and recorded the conversations by using the loudspeaker on the telephone and an external tape recorder. The recording of the conversation was only done if we at the beginning of the interview got the permission from the interviewee. The answers from the interview are presented as anonymous.

### *The interview:*

1. Kan du kort fortelle om:

- Ansiennitet som PM og som ansatt i Faveo
- Hvilke hoved-arbeidsoppgaver stillingen din innebærer

2. Kan du kort gi en beskrivelse av hvordan lagring og deling av kunnskap i din avdeling/region fungerer?

- A. Hvilke mekanismer er tilstede?
  - Hvilke fungerer/fungerer ikke?
- B. Hvilke mekanismer mangler?
  - Forslag til forbedringer?

2.1 Vi har inntrykk av at Faveo Academy har ansvaret for en stor del av læringen i Faveo. Hvor kommer materialet til temakvelder og liknende fra?

- Lagrede lessons fra alle, eller kun de som er ansvarlige for Faveo Academy?

2.2 Vi fikk veldig sprikende svar på hvorvidt enkelte aktiviteter benyttes i Faveo. Er det noen av disse som benyttes ved din avdeling?

Knowledge Manager:	83%	No/Don't know.
After Action Review	69,05%	No/Don't know.
Knowledge Audit	76,19%	No/Don't know.

3. Av de som tok spørreundersøkelsen svarte 71% at de vet om et lessons learned-system i organisasjonen. 29 % svarte altså at de ikke vet om et lessons learned-system.

- På hvilken måte informerer Faveo sine ansatte om et slikt system?
  - Bruk av for eksempel intern-avis, forum, Faveo academy/kurs.
- Knowledge management is a recurring theme in our internal communications

(newsletters etc.): 73% i "agree" skiktet

- I have read/heard several success stories from the use of our knowledge management system: 50/50 "agree"/"disagree".

4. Er lagring og deling av kunnskap noe Faveo har som en del av opplæringen? Hvordan er dette eventuelt utført på ditt kontor?

- Recording and sharing knowledge was part of my internal training:
  - Rundt 40% i "disagree" skiktet og 60% i "agree" skiktet.
  - Correlations:
    - When I find lessons they are relevant and easy to understand 0,581
    - I know what is expected of me in regards to recording 0,542

5. Med utgangspunkt i spørreundersøkelsen svarte flertallet at ledelsen støtter bruk av tid til kunnskapsledelse. Samtidig er det en stor del av deltagerne som mener at de har for lite tid til å lese og lagre "lessons learned" før og etter prosjekt. Hva tror du kan være årsaken til dette?

- Top management actively supports spending time on knowledge management activities: Rundt 70% i "agree". Samtidig:
  - There is usually time to search for lessons at the start of projects: 40% i "disagree" skiktet.
  - There is usually time to record lessons at the end of projects: 70% i "disagree" skiktet.
  - Management wants us to record knowledge, but it does not work in practice: 63% i "agree" skiktet.
  - What do you feel is currently hindering knowledge sharing in the organization?
    - Available time: 63%

6. Rundt ¾ av de som deltok i spørreundersøkelsen sier enten at Faveo ikke har en nedskrevet Knowledge Management strategi, eller at de ikke vet om en.

- A. Vet du av en definert knowledge management strategi i Faveo?
- B. Er dette noe som eventuelt blir fulgt opp?
- C. Kan vi få tilsendt et slikt dokument?

- The organization has a clear and communicated goal with the knowledge management system: 50/50 "agree"/"disagree"
- (Do you know of) A defined and written knowledge management strategy: 73% svarte nei eller at de ikke vet.
  - Correlations:
    - When I find lessons they are relevant and easy to understand 0,621
    - I know what is expected of me in regards to recording 0,670

7.

- A. Har Faveo et offisielt lessons learned-system? Finnes det flere lessons learned-systemer i organisasjonen?
  - B. Hvor kommer som regel lessons learned fra? Interne dokument på kontoret, fra portalen, intranett, kurs, faveo academy, person-til-person?
  - C. Hvor nyttig føler du intern utviklet teori er i “den virkelige verden”?
- We have a defined process for using and recording knowledge: ca. 50% i “disagree” skiktet og 50% i “agree” skiktet.
    - Correlations:
    - When I find lessons they are relevant and easy to understand 0,590
    - I know what is expected of me in regards to recording 0,552
    - Time to record lessons at the end 0,502
    - I feel that my contribution of lessons influence project outcome 0,520

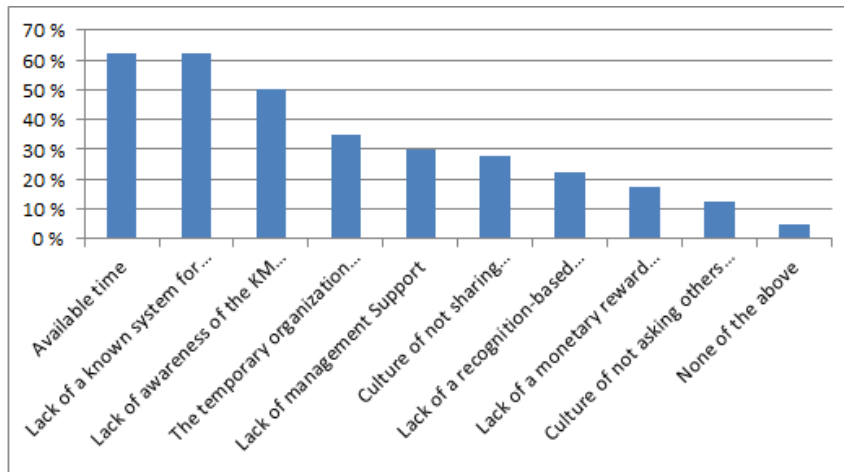
8.

- A. Vi fikk delte tilbakemeldinger på om det finnes et belønningssystem for å lagre lessons. Finnes dette, og hvordan? Er dette noe som varierer mellom regionene/avdelingene (siden i overkant av 20% havner i “agree” skiktet)
- What do you feel is currently hindering knowledge sharing in the organization?
    - “People in the organization have different kind of payment/salary/bonus/rewarding systems. This affect the willingness and motivation to contribute to the knowledge sharing. There is a cost/beneficiary assessment to use manhours on systems not paid for.”
- A. Hvordan stiller du deg til et formellt belønningssystem for lagring og deling av kunnskap? Fordeler? Ulemper?
- We have a reward system in place for recording knowledge: 77% havner i skiktet “disagree”.
    - 60% oppga at de ville være mer motivert til å lagre erfaringer.
      - Correlations:
      - When I find lessons they are relevant and easy to understand 0,615
      - I know what is expected of me in regards to recording 0,575

9. Hva gjør Faveo for å motivere de ansatte til å bruke lessons learned-systemet?

10. Diskutere rundt dette?

What do you feel is currently hindering knowledge sharing in the organization?



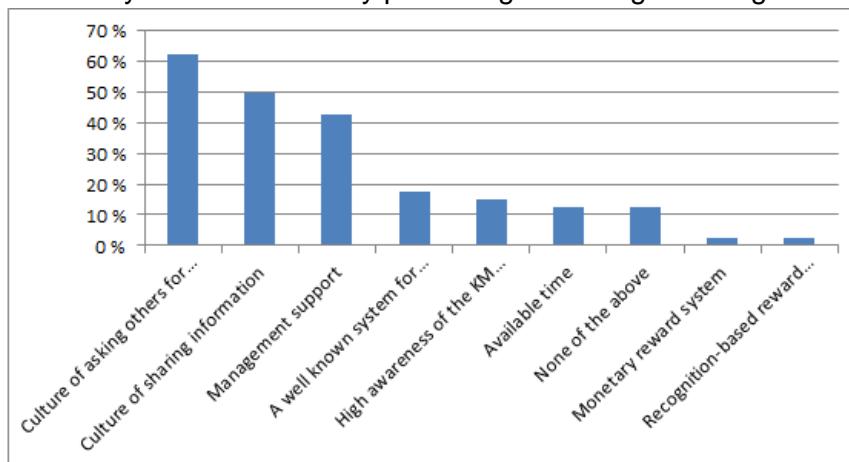
Available time: 63,41%

Lack of known system for recording: 63,41%

Lack of awareness: 51,22%

- ... er de tre viktigste hindrene for knowledge sharing i Faveo.
  - Hva tror du er grunnen til dette, og hvorfor?
  - Hva kan gjøres for å forbedre dette?

What do you feel is currently promoting knowledge sharing in the organization?



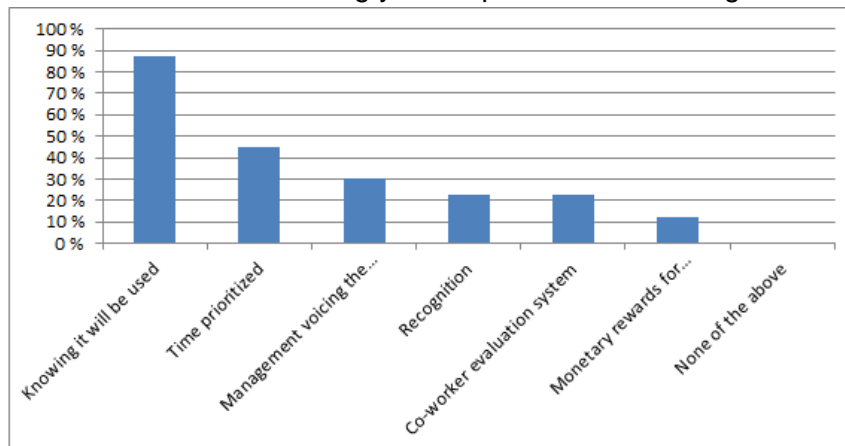
Culture of asking others for help/advice: 62,5%

Culture of sharing information: 50%

Management support: 42,5%

- ... er de tre viktigste fasilitatorene for knowledge sharing i Faveo.
  - Hva tror du er grunnen til dette, og hvorfor?
  - Hva kan gjøres for å forbedre dette?

What is crucial in motivating you to spend time recording lessons learned?



Knowing it will be used: 87,5%

Time prioritized and earmarked for recording lessons: 45%

Management voicing the importance of knowledge management: 30%

- Har du noen forslag til hvordan man kan fremme disse motivasjonsfaktorene?

### Data analysis guidelines

After the collection of the data from the questionnaire and the interviewees, we sorted the answers in groups that to a large degree are based on the barriers towards and effective knowledge management system that we presented in the theory chapter:

- Strategy
- Organizational Culture
- Formal Systems
  - Awareness and Effectiveness
  - IT System
  - Faveo Academy
  - Operational Routines
  - Knowledge Manager
  - After Action Review
  - Knowledge Audit
- Training
- Management Support
- Time and Opportunity Cost
- Motivation
  - Reward system
  - Feedback
- Communication
- Temporary Organization of Projects
- Individual Survival-Instinct

By placing evidence from the questionnaire (graphs and correlations), interviews, and formal documents in the relevant groups above, we could easily analyze each barrier. Further, by the use of the pattern matching technique, we matched the results from the analysis with the prediction that was based on previous relevant theory.

## Appendix 2: Interview Results

### 1. Kan du kort fortelle om:

- **Ansiennitet som PM og som ansatt i Faveo**
- **Hvilke hoved-arbeidsoppgaver stillingen din innebærer**

[Removed for anonymity purposes]

### 2. Kan du kort gi en beskrivelse av hvordan lagring og deling av kunnskap i din avdeling/region fungerer?

#### A. Hvilke mekanismer er tilstede?

- **Hvilke fungerer/fungerer ikke?**

#### B. Hvilke mekanismer mangler?

- **Forslag til forbedringer?**

Portalen SharePoint. Produserer tips som legges ut i portalen.

Direkte henvendelser. Lync og personlig kontakt.

Ingen mangler ved systemet.

Den altoverstyrende, viktigste måten både å utarbeide å dele, er å bruke kompetente mennesker som jobber sammen. Finnes systemer som gjør dette lettere, og som gjør at alt ikke trenger å gå fra munn til øret. Vi har både faglige grupper og fagansvarlige. Vi har et virksomhetssystem hvor det er lagret en god del erfaringer. Systemet er ikke så sentralt i vår hverdag som det kunne/burde ha vært. Jeg opplever en relativt stor frihet i realiteten til å bruke de systemene og verktøyene. Det ligger et ganske godt system der det går an å finne ut hvem som har gjort hva, og vi har kompetanseprogram gjennom Academy.

*Kan vi forstå det sånn at hoveddelingen skjer uformelt mellom arbeidere som jobber sammen?*

Ja.

Bruk av platform (Portalen/Share Point) der vi kan gå tilbake å finne ting vi har laget, og bruk av academy. Dette er den strukturerte delen av kunnskapsdelingen. Den viktigste arenaen: uformelle delingen mellom medarbeidere. Deling mellom de fra Faveo som er med i samme prosjekt.

Bruker Portalen i til alle prosjekter (i varierende grad). Portalen fungerer både som lagringsarena for prosjektmateriale og som tilgangspunkt til prosjektverktøy.

Sannsynligvis mange tiltak som kunne forbedret det, men jeg er fan av den uformelle delingen. Anser det som mest verdifullt.

Portalen der vi har ulike fagområder representert. Prosjektinformasjon tilknyttes her, i tillegg til annen relevant info til spesifikke fagområder.



Verktøykasse med alt fra lovverk, retningslinjer til konkrete eksempler, maler osv.

Det å ta verktøyet effektivt i bruk kan vi bli bedre på. Jobber for mye individuelt.

Vi er vesentlig dårligere enn andre større firma (på det med å lagre og dele kunnskap). Større konsultentselskap har mye mer struktur på angående akkurat dette, og det kommer av at de har en mye yngre arbeidsstokk. Det jeg savner mest er prosjekter som involverer mer enn en ansatt. Dette gjør at vi i liten grad får noen synergieffekt.

Det burde være et sjekkpunkt i starten av et prosjekt: Har vi gjort noe lignende før? Også på slutten av et prosjekt: Hva kunnskap kan vi ta med oss videre? Dette har ikke jeg erfart i min tid i Faveo.

Sånn det fungerer nå, så må vi lete etter folk som har kunnskap om det vi lurte på. Veldig tilfeldig og tungvint.

Bruker det felles systemet. Fokus på å oppdatere sine SharePoint profiler med hva man er gode på, type "spør meg om:". Ikke alle er like gode å oppdatere disse. Primært muntlig overlevering. Lite miljø ved dette kontoret, så fokus på å uformelt holde hverandre oppdaterte på hvilke prosjekter man holder på med.

Egne distriktsmøter med fagtema for å fortelle hva man er gode på. Ved prosjektoppstart kan man prøve å søke på tilsvarende prosjekter og så kontakte de som var med på det.

Kan bli bedre på formelle ting som prosjektavslutning. Vanskelig å få til i praksis.

## **2.1 Vi har inntrykk av at Faveo Academy har ansvaret for en stor del av læringen i Faveo. Hvor kommer materialet til temakvelder og liknende fra?**

- **Lagrede lessons fra alle, eller kun de som er ansvarlige for Faveo Academy?**

Antar erfaringer. Alle kan bidra. Det finnes faste som har ansvar for Academy, men alle kan bidra.

Det kan være både og. En del seminarer og kurs er relativt tungt basert på akademisk input. Andre kurs og aktiviteter er hovedsaklig basert på erfaring og prosjekter, og er erfaringskunnskap. En tredje kategori er en mix.

*Vil du si at det er vanlig at prosjektledere i Faveo, hvis de plukker opp erfaringer i et prosjekt tar det inn i for eksempel en temakveld?*

Jeg har ikke oversikt over hvor stor andel som gjør det, men det er helt sikkert de som gjør det ofte og de som aldri gjør det. Jeg har ikke opplevd at det er en stram Faveo-praksis at "sånn og sånn" i den grad gjør vi det. Det er et ønske og en intensjon som alle er enig om, men i praksis så er det ikke sånn, og dette er på en måte akseptert i kulturen.

*Kan du si noe om hvorfor det er akseptert at det ikke gjøres?*

Det ene er rett og slett bransjekulturen i bygg og anlegg (litt ad-hoc). Det er den ene delen av det. Det andre er at det er litt for stor avstand mellom det systematiske academy etableringen virksomheten, både i form av innhold og systemtenkning, og et praktiske. Det er litt mismatch mellom mottaker og leverandør, i forhold til at det skal bli veldig lett anvendelig. Det er veldig bra og veldig riktig, men det krever litt kurssetting, litt oversettelse og fasilitering fra Academy og ut i praksis.

Litt på tynn is. Uttaler meg om bruken av academy. Har inntrykk av at den som holder kurset er bidragsyter til materiell.

Har i liten grad opplevelse at jeg får bidra med noe til Academy. Det er de som driver med det som står for innholdet.

Folk engasjeres ut fra den kunnskapen man har. Ansatte bidrar, men det skjer ikke uten en (?) fra FoU-leder.

## **2.2 Vi fikk veldig sprikende svar på hvorvidt enkelte aktiviteter benyttes i Faveo. Er det noen av disse som benyttes ved din avdeling?**

### **Knowledge Manager:**

Nei.

Det er ikke en spesifikk rolle, i den grad jeg er klar over. Mange vil nok si at det ligger i en prosjektleders ansva.

Nei.

Nei, ikke som jeg vet om. Må ikke opprette egne aktører med ansvar på dette. Må være en bedriftskultur der ansvaret ligger på den enkelte.

### **After Action Review:**

Vet ikke.

Hvertfall ikke alltid. Jeg har ikke den opplevelsen av at det gjøres ofte. Det vi tenker: gjenbruk av folk og team som har gjort lignende ting før, og sikre gjenbruk av kunnskap på den måten.

Gjør ikke alltid det, men det er en målsetting. Det ligger mye læring i det.

*Grunn til at dere ikke gjør det? Arbeidspresset.*

Ligger i styringssystemet at det skal gjøres, men gjøres i for liten grad.

Ledelsen krever at det skal lages en sluttrapport for alle prosjekter over en viss størrelse. Bevisstheten rundt det er der, og ledelsen følger opp at det gjøres.

Ikke systematisert, så man gjør det hele tiden. Kan være det brukes i enkelte prosjekter, men har ikke vært med på det selv. Ser at man burde gjort det.

Sier senere at det "er vel noe man skal gjøre" - man blir oppfordret til det dersom det har vært spesielle problemstillinger, men dette blir ikke blir fulgt opp.

## **Knowledge Audit:**

Vet ikke.

Om vi gjør en rendyrket audit i den forstand er jeg usikker på, men noe av det vi er ganske flink til, er å gjøre grundige prosjektoppstarter, som også omfatter hvilken kompetanse vi trenger for å gjøre det.

Ja, men ikke i alle prosjekt. Vi gjør det i viktige prosjekt.

Ja, strukturert og ustrukturert. Nødvendig kompetanse defineres i tilbudsfasen. Etter oppstart er det møte med kunden hvor forventninger for leveransen defineres.

Interne oppstartsmøter ved prosjektstart. Finne hvilken kompetanse man trenger, hva man evt mangler og må hente utenfra. Noen som har gjort det før?

### **3. Av de som tok spørreundersøkelsen svarte 71% at de vet om et lessons learned-system i organisasjonen. 29 % svarte altså at de ikke vet om et lessons learned-system.**

- **På hvilken måte informerer Faveo sine ansatte om et slikt system?**
  - **Bruk av for eksempel intern-avis, forum, Faveo academy/kurs.**

Usikker.

Noe av det jeg synes er fasinerende med Faveo er at det er nysgjerrighet og interesse rundt fagelige arrangement, og vi er ganske flink til å ha fagseminarer, både frokostseminarer og (). Vi har noen samlinger innenfor seksjonene, grupperinger og en del kursing, og det er en fagelig nysgjerrighet som er god, som gjør at man får spredd brukbart det som skjer. Jeg tror at kulturen vår er sterkere og er viktigere enn verktøyene per i dag. Jeg tror at kulturen holder en høyere standard enn verktøyene gjør, å det betyr at vi får formidlet en del av den verdifulle kunnskapen, like mye på tross av systemene enn gjennom systemene.

Blir ikke gjort i utstrakt grad.

Har knapt informert om det. Opptatt av at folk bruker portalen til å lagre dokumentasjon og best case i prosjektfila. Ingen bevist på å bruke den delen av verktøyet.

Vet ikke om noe lessons learned system.

Det kommer vel noen påminnelser på intranettet, kanskje en gang i halvåret, og så blir det tatt opp i regionsmøter.

### **4. Er lagring og deling av kunnskap noe Faveo har som en del av opplæringen? Hvordan**

## er dette eventuelt utført på ditt kontor?

Ja. Eget nyansatt program. Inkluderer todagers produksjonskurs i prosjektledelse. Gjennomgår prosjektmetodikken.

Det synes jeg er direkte bra. Den måten vi har introduksjonskurs...blir presanert for systemer og verktøy. For eksempel Share Point prosjektarkivene er sentralt, og også kunnskapsverktøy som ligger i portalen.

Om man er nyansatt i Faveo, har dere noen rutiner på å formidle hva som er forventet av den enkelte i form av å dele kunnskap man opparbeider seg i et prosjekt?

Ikke veldig eksplisitt tror jeg. Det blir vel mer at du blir introdusert for en samarbeidsorientert kultur og du lærer å høste av andres erfaring som indirekte blir en oppfordring til å dele selv, men ikke i noen eksplisitt kvantifisert form, så vidt jeg vet.

Nei, ikke direkte. Ikke annet en at vi gjør de oppmerksom på hvor man kan finne det (kompetanse/kunnskap/erfaring). Men det er ikke et punkt på opplæringsplanen.

Kommet ytring fra lederhold om at systemene må omstruktureres. Slik det ligger nå, så er det et uhensmessig format for opplæring.

Kjenner ikke til innholdet i introkursen. Opptatt av å jobbe i team. Bruker møter og menneskelige relasjoner for erfaringsoverføring. IT-systemet brukes for lite hvertfall her

Bare vært gjennom halvparten. Opplæringen består av to deler: prosjektledelsekurs og innføring i system. Har kun vært med på prosjektlederkurs.

Alle ansatte går gjennom en felles opplæring (3 dagers introkurs) i Oslo. Hvordan SharePoint løsningen er bygd opp, hvor man finner informasjon. Ikke fokus på hvordan man lagrer erfaringer. Fokus på "spør meg om" i profilen.

## **5. Med utgangspunkt i spørreundersøkelsen svarte flertallet at ledelsen støtter bruk av tid til kunnskapsledelse. Samtidig er det en stor del av deltagerne som mener at de har for lite tid til å lese og lagre "lessons learned" før og etter prosjekt. Hva tror du kan være årsaken til dette?**

Man måles på utfakturert tid.

De to viktigste årsakene, er for det første at det er vanskelig å kreve og å få til på en god måte. Det er vanskelig. Det er ikke enkelt å få satt sånt godt i system, og få det til å fungere godt. Det er det ene svaret. Det andre er at i en prosjektbasert virksomhet så springer man litt fra et prosjekt til et annet. Avslutning i et prosjekt er ofte hektisk og oppstarten i neste prosjekt er ofte hektisk, og det er nødvendigvis ikke noe dødtid mellom hvor man kan reflektere og systemsette

kunnskap. Travelheten i en prosjekthverdag tar oss litt.

Litt for enkelt å skylde på arbeidspresset. Har ikke i stor nok grad syneliggjort det med informasjonsdeling og opplæring. Jeg kunne tenke meg et mer strukturert forhold til det her (for eksempel å føre opp antall timer brukt til kompetanseheving). Dette tror jeg ville ha vært en motivator. Lett at omsetning blir den mest verdifulle KPIen. Har ikke KPI for kompetanseheving.

Hektisk hverdag. Opptatt av å ta folk ut av arbeidssituasjonen for å prioritere tid på kurs. Oppstartsaktiviteter og å avslutte på en riktig måte er ofte i konflikt med andre løpende oppgaver. Avhengige av mange baller i luften for å holde en fornuftig debiteringsgrad i inntjening.

En ting er å støtte det. Men det må tilrettelegges og prioriteres. Fallgruvene er jo det at de som er flink og får solgt timene sine får holde på med det, mens de som sliter med å få solgt timene sine blir sittende med interne ting som kunnskapsdeling. Det er de flinke som må brukes til dette.

Opplever ikke at det er for lite tid. Det handler om å ta seg tid. Å innhente informasjon er en del av oppgaveløsningen. Det kan hende at resultatene er farget av at det er ganske mange som er satt ut som bemanning hos andre og jobber ikke i systemet til Faveo på egne pcer og systemer. De har da heller ikke tilgang til Faveos nett.

Lagring går på å ta seg tid, men man er ikke gira på slutten. Det er i praksis ikke en stor jobb å lagre på slutten/fortløpende. Kjedelig gjøremål man må tvinges til å gjennomføre. Det bør ikke være mange sider prosa, men få formidlet hvilke problemstillinger man har hatt og oppfordre folk til å ta kontakt.

**6. Rundt ¾ av de som deltok i spørreundersøkelsen sier enten at Faveo ikke har en nedskrevet Knowledge Management strategi, eller at de ikke vet om en.**

- A. Vet du av en definert knowledge management strategi i Faveo?**
- B. Er dette noe som eventuelt blir fulgt opp?**
- C. Kan vi få tilsendt et slikt dokument?**

Nei, vet ikke.

Strengt tatt så vet jeg ikke det. Det jeg vet er at det er en forventning om at vi deler kunnskap, ikke at det er en eksplisitt knowledge management strategi. Ikke en egen strategi. Ikke såvidt jeg vet.

Det vet jeg ikke om jeg synes vi skal ha heller, for å si det sånn. Jeg tenker at på samme måte som hvor eksplisitt elementer av det vi skal kjennetegnes av å drive med skal være en egen strategi, eller om du skal si at vi skal ha en bedriftskultur som baserer seg på kunnskapsdeling. Det er to forskjellige filosofier for å oppnå det samme. Det er jeg ganske sikker på, er at vi har en kultur som har forståelse for verdien av kunnskapsdeling og man vet at det forventes, og

applauderes, og det er den måten vi blir brukbar til å dele kunnskap på. Så den mer systematiske, akademiske, strukturerte å tenke en eksplisitt strategi på er like...() vår måte å gjøre ting på. Det er et filosofivalg.

Ja. Vi har hatt en strategi angående kurs og opplæring.

Strategiplanen er overordnet det som vi kaller handlingsplan. Handlingsplanen er på regionsnivå. Kompetanseheving er et punkt vi har implementert fra strategiplanen til vår handlingsplan. I handlingsplanen har vi skrevet at vi skal lage en plan for kompetanseheving i løpet av året. Under medarbeidersamtalen peker vi ut en ønsket retning, med tanke på kompetanseheving. Målet med dette er å styrke basiskompetansen.

Nei. Usikker på om vi har/bør ha en definisjon på det, eller om man bør ha flere.

Kan ikke si at jeg har sett det. Men det er opplagt at vi må ha det. Vi selger kunnskap, og burde derfor ha et aktivt forhold til det å forvalte kunnskap. Jeg synes man har et for lite aktivt forhold til det. Det stilles ikke krav til at man gjør noe aktivt, og man blir heller ikke belønnet.

Vet ikke om en nedskreven strategi, men det er et stadig tema i møter og ledermøter.

7.

- A. Har Faveo et offisielt lessons learned-system? Finnes det flere lessons learned-systemer i organisasjonen?**
- B. Hvor kommer som regel lessons learned fra? Interne dokument på kontoret, fra portalen, intranett, kurs, faveo academy, person-til-person?**
- C. Hvor nyttig føler du intern utviklet teori er i “den virkelige verden”?**

Det er kun portalen (bygd på MS SharePoint) som eksisterer. FoU direktør ansvarlig for Academy og prosjektmedodikk.

Portalen inneholder ellers intranett, virksomhetssystem, admin, prosjektweb. Alt lagres i portalen.

Ingen moderatorer for å legge inn info (f.eks. erfaringsskriv) i portalen. Tviler på at folk gjør det. Ting som legges inn kvalitetsskontrolleres. En ansvarlig for hvert metodikkområde (fagansvarlige). Skal metodikken endres, går det gjennom moderatorer.

Sidene for Academy og metodikk ble innført i 2011. Før det ble egne fagsider brukt. Ved skifte ble det gjort en gjennomgang av det som lå der. Noe tatt vare på. Gammel programvare er ikke slettet, men fjernet tilgang til.

Erfaringsbasert læring forbedring og endring nyttig. Prosjektledere er praktikere. Akademisk kunnskap mindre å si for videreutvikling. Mye er tuftet på PMI teoriene.

Det er vel stort sett Portalen/Share Point, så det er i utgangspunktet ganske enkelt. Det har vi helt sikkert, i en eller annen grad. Der kan ikke jeg nok om detaljene.

Variierer veldig. I sum er den både nyttig og viktig, men jeg tror den kan bli bedre og nyttigere og dermed viktigere. Det ville vært katastrofalt å ikke ha det for oss. Det kan bli bedre innhold og

bedre form.

*Så dere har altså noen som er definerte fagansvarlig innenfor de forskjellige områdene?*

Ja, i mange dimensjoner tror jeg.

Synes det er veldig nyttig. Mange av de er laget med tanke på praktisk anvendelse.

Mest portalen. Noen enkeltprosjekter benytter andre systemer med hensyn til kunden. For min del begrenset nytte. At vi jobber i tidligfase gjør at det er mindre forutsigbare prosesser hvor du kan forholde deg til noe som er klart definert. Man må tilpasse seg situasjonen. I tillegg er holdningen at vi ikke er flinke nok til å dele inn i systemet og heller tar fram det vi kjenner og har brukt før.

Brukt søkemotoren på SharePoint. Fant lite. Har ikke lagt inn noe selv.

8.

**A) Vi fikk delte tilbakemeldinger på om det finnes et belønningssystem for å lagre lessons. Finnes dette, og hvordan? Er dette noe som varierer mellom regionene/avdelingene (siden i overkant av 20% havner i "agree" skitet)**

Nei. (generelt i Faveo. Usikker om det varierer mellom kontorene).

Lønnsbasert: Det vil du sannsynligvis få to svar på; både ja og nei. Noen er kjempeflink til å dele kunnskap, både å legge det inn i system og å formidle det videre til andre, og det er en av grunnene til at de blir verdsatt...() mellomledere som får en god lønnsutvikling. Andre er ikke opptatt av/ har ikke prioriteringene, og dermed så får de heller ikke lønnsutvikling basert på det. Men det er ikke noen som har sittet å telt antall innlegg og antall dokumentasjoner og som bruker matematikk til å gi det en lønnsverdi.

*Det blir da en subjektiv vurdering av den som er lønnsansvarlig ?*

Ja. Det er litt knyttet opp til utviklingsavtaler, for ganske mange har gjennom avtalen avtaler som sier at i det neste året skal bidra til gitte utviklingstiltak, som for eksempel skal være å lage et kurs eller å holde et kurs, eller på den andre siden at du skal tilegne deg kunnskap gjennom at du skal gå på kurs eller bruk av ting. I den forstand er de tiltakene som gjelder for lønnsansvarlig er også et underlag for å vurdere lønn, om det man har blitt enig om har blitt gjort. Det er litt mer kvantifiserte varianter.

Recognition: Det har vi ikke. Men jeg opplever at den uformelle anerkjennelsen av de som er flink til å formidle og dele og bidra til andre er kjempe sterk. Da er vi tilbake til den veldig positive litt uformelle delen av kulturen. Det er noe av det flotte ved kulturen.

Ikke at det ligger et system der. Det ligger ikke et belønningssystem i forhold til dette.

Andre mekanismer (f.eks månedens kunnskapsdeler) har jeg ikke troen på. Jeg tror ikke noen

føler seg verdsatt med å få en pris for månedens kunnskapsdeler. Jeg tror folk er litt mer sammensatt og kompleks enn det.

Det jeg tenker at dere må spekulere dere frem til noen KPIer som det går an å bruke, hvor man kan kvantifisere kompetansedeling og egen kompetanseheving.

Innsatsen i bedriften vurderes ut fra flere kriterier, inkludert hvordan man bidrar til informasjonsutveksling, engasjement osv. En som er aktiv og utpekes der vil nok fanges opp og belønnes. Ingen tydelig premiering for dette.

Ingen bonus, men påvirker årlig lønnsvurdering. Positiv tilbakemelding tror jeg vi er flinke til. Tror det er forskjellig helt ned på seksjonsledernivå hvor mye dette vektlegges.

Det er en prosedyre på prosjektavslutning, men ingen belønning.

### **B) Hvordan stiller du deg til et formelt belønningssystem for lagring og deling av kunnskap? Fordeler? Ulemper?**

Ingen synspunkter.

Det må i så fall bli veldig riktig, rettferdig og bra før det er riktig å gjøre. Det er hvertfall ikke enkelt å lage et system som rettferdiggjør noe sånt. Jeg ser mange flere ulemper enn fordeler, eller fallgruver. Jeg tror det er vanskelig å få det riktig og godt nok. Det er fryktelig vanskelig, tror jeg, å få skilt mellom viktige og helt uvesentlige innlegg/bidrag. Jeg tror du kan risikere å få et fokus på kvantitet og ikke kvalitet. Hvis ikke kvaliteten er høy nok er det farlig å innføre slike mekanismer. Jeg tror ikke det er noe for oss, for å si det først.

Det er både positive og negative sider. Jeg tror du får et litt for innoverrettet fokus, og da tror jeg vi går glipp av en del ting. Jeg tenker at hovedlæringen må ligge i det vi gjør i prosjekter.

Som nevnt tidligere, tror jeg at vi må synliggjøre kompetansehevingsaktivitetene, og tydeligere formidle hva som er forventet i forhold til kompetanseheving.

Ser for meg at oppfølging av et slikt system er enkelt. Skriv antall timer i en "kunnskapsheving"-boks.

Vanskelig å direkte måle dette. Må inn i en totalvurdering av internt arbeid og oppgaveoppfølging.

Tror ikke det skal være lønnsbasert. Tror det skulle ha vært et punkt i lønnsavtalen. Det tror jeg kunne hatt en god effekt.

Alle ønsker informasjonen tilgjengelig når de trenger den (at andre skal skrive), men det å sette av tid til å skrive selv er vanskelig "å finne tid til". Et belønningssystem kan være nyttig for å få folk til å bruke tid på det.



Annerkjennelse faglig og løfte fram de som er spesielt flinke til å dele. Viktig i et firma som vårt. Hvertfall i begynnelsen for å skape bevissthet om dette. F.eks. at noen får skryt på intranett om at man er god. Dette innebærer jo at noen må følge med da, en adm. ressurs. Tror ikke det er det nå. Det er også vanskelig å få det til å vare etter det "første stuntet".

Tror det er verre å knytte det til lønn. Lønnen er helt individuelt, vet ikke hvem som tjener hva og har ingenting å sammenlikne med og hva man får ekstra.

## **9. Hva gjør Faveo for å motivere de ansatte til å bruke lessons learned-systemet?**

Lav terskel for å være med på Academy kurs. Alle vet hvor og når og kan delta. Ingenting spesifikt for lagring i portalen.

Vi holder CV'ene oppdatert og bruker prosjektområdene på Share Point eller i portalen til å lagre informasjon og kunnskap, og vi er opptatt av å følge opp at det jobbes på riktig måte med systemer og verktøy i prosjekter. Der blir jeg fulgt opp av sjefene på en del av områdene. Det er viktig å si at jeg ikke har vært her lenge, og at jeg i liten grad kjenner i hvor stor grad dette blir brukt i byggprosjekter, og det er det som tross alt er hovedfokuset og hovedinnholdet.

*Vil du si at Faveo er veldig påvirket av at nettopp bygg og anlegg er de største kundene, og at det er mye av den kulturen som smitte over?*

Ja, det håper jeg. Det er jo der vi har største del av businesses vår.

Man har en generell motivasjon til å benytte seg av kurs og academy. Jeg har mer tro på den enkeltes motivasjon til egenutvikling. Det er det som burde ligge til grunn. Lokkemidler har jeg ikke så stor tro på.

Et annet viktig tema er hva man gjør når man har ledig tid. Der tror jeg vi har et potensiale. Istedenfor å bruke den ledige tiden til andre ting, så kan man bruke det til egen kompetanseutvikling eller at man kan bidra til andres kompetanseutvikling (For eksempel at man kjører et kurs om man har 14 dager mellom prosjektene).

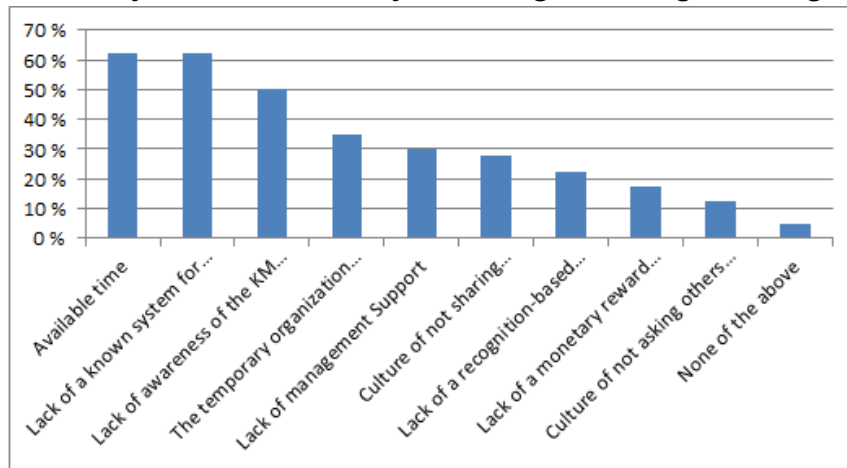
Jeg tror mange finner motivasjon i å innta undervisningsrollen.

Min opplevelse er at det blir gjort ingenting.

Vil ikke si det. Man sender ut noe informasjon, så er det basert på egeninteresse. "Man må dele med andre om man skal få noe tilbake".

## 10. Diskutere rundt dette:

**What do you feel is currently hindering knowledge sharing in the organization?**



**Available time: 63,41%**

**Lack of known system for recording: 63,41%**

**Lack of awareness: 51,22%**

- ... er de tre viktigste hindrene for knowledge sharing i Faveo.
  - Hva tror du er grunnen til dette, og hvorfor?
  - Hva kan gjøres for å forbedre dette?

Man blir målt på faktureringsgrad. Når du står oppi prosjektet ditt prioriteres ikke noe annet.

Det er vel mye av det vi har vært inne på tidligere, at man for det første så oppleves det kun matnyttig kun der og da, litt for stort gap mellom det faglige og det praktiske, det oppleves stor frihet i forhold til i hvilken grad man spesifikt bruker og gjør...() og at det er tenkt litt for komplisert (?) per i dag i forhold til hva som er realistisk.

*Hva tror du kan gjøres for å forbedre det her?*

Punkt nummer en er å få sterkere organisering og sterkere styring fra brukermiljøene, prøve å skape mer systemer basert på behovene i prosjektene. Gjøre det enklere å bruke og enklere å finne.

*Hvordan er organiseringen av fagansvar for komplisert tenker du?*

Det pågår såvidt jeg vet, en gjennomgang på hvordan dette skal gjøres. Vi har altså mange som er fagansvarlig for fagområdene.

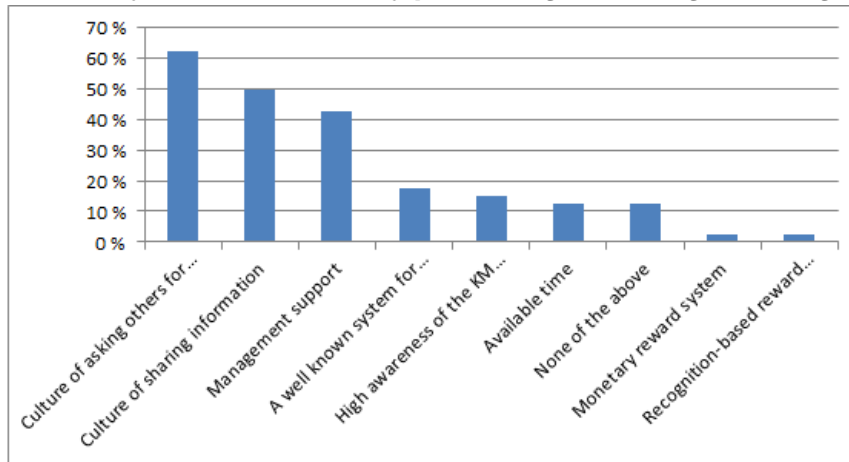
*Så det er rett og slett for mange som er med på det her?*

Ja.

*Litt tilbake til det jeg har nevnt før. Det med å stille krav fra lederhold (Innføre spesifikt antall timer til kompetanseutvikling.)*

Når prosjektet er ferdig vil folk videre til neste prosjekt. Avslutningen er motivasjonen lav og man vil til nye prosjekter.

### What do you feel is currently promoting knowledge sharing in the organization?



**Culture of asking others for help/advice: 62,5%**

**Culture of sharing information: 50%**

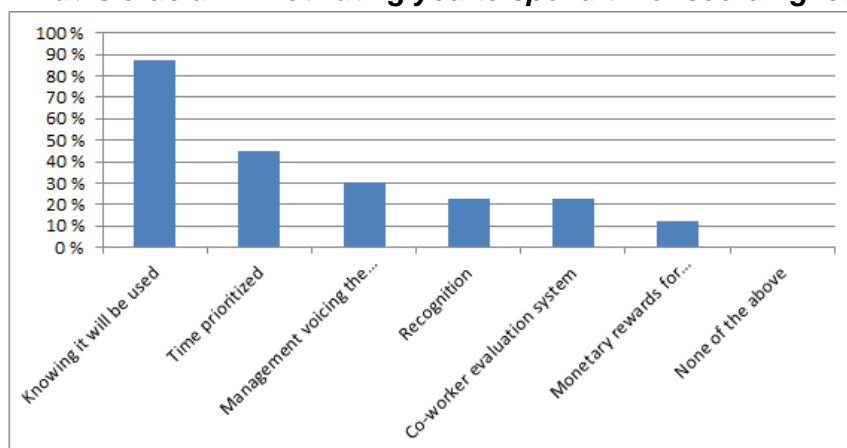
**Management support: 42,5%**

- ... er de tre viktigste fasilitatorene for knowledge sharing i Faveo.
  - Hva tror du er grunnen til dette, og hvorfor?
  - Hva kan gjøres for å forbedre dette?

Kultur bygges gradvis opp. Både ang. deling og det å spørre.

Det er samme grunn som du sa at det er en forståelse for at det er ønskelig og tillatt å prioritere fag. Det er mye fagaktivitet, det er at vi rekrutterer faglige motiverte personer, vi oppsøker faglig krevende jobber. Det ligger litt i alt vi er og gjør tenker jeg. Det er litt av forskjellen mellom oss og rådgivende ingeniører som er mer ingeniørfagelig, ...() mens vi har mer fokus på prosjektgjennomføring, prosjektledelse og prosjektstyring, og dermed så vet en del folk om...() Det samme gjelder i forhold til entreprenører og byggherrer er at vi har et sterkere faglig fokus på å være profesjonell (innenfor) prosjektstyring, prosessdriving, mens de er mer produktorientert. Det er det fokuset vi har som blir verdsatt.

### **What is crucial in motivating you to spend time recording lessons learned?**



**Knowing it will be used: 87,5%**

**Time prioritized and earmarked for recording lessons: 45%**

**Management voicing the importance of knowledge management: 30%**

- **Har du noen forslag til hvordan man kan fremme disse motivasjonsfaktorene?**

Ingen kommentar. Vanskelig å svare på.

Folk opplever selv om det blir brukt eller ikke.

Prioritert tid:

Jeg tror de fleste som virkelig prioriterer det, opplever at de får den tiden og at det er anerkjent å bruke den tiden. Det krever selvfølgelig en viss fleksibilitet i forhold til når. Du kan ikke ta et kurs eller gjøre noen ting midt oppe i den travleste tiden midt oppe i et prosjekt, men at du får fylt opp med kunnskap og får prioritert tide til det, tror jeg mange opplever at de får til på et vis og at det er støttet av lederen, viss man gjør det litt planlagt. At det er akseptert at man gjør det, det er jeg relativt trygg på.

*Har du opplevd at noen sier at på slutten av et prosjekt så skal vi gå gjennom prosjektet og se hva som fungerte og hva som ikke fungerte?*

Jeg er ikke helt sikker på om at jeg kan peke på noen som har gjort det helt bokstavelig rett etter et gitt prosjekt. Men om ikke alle, så er det mange som blir involvert i det å lagre å holde seminar og kurs, og fagmateriell, men ikke nødvendigvis akkurat etter at prosjektet er ferdig, basert på akkurat det man finner ut på det prosjektet.

*Hva er dine tanker om å innføre et sånt system?*

Det er veldig riktig å finne en effektiv og egnet måte å systematisere erfaringer og læringer fra et prosjekt. En hensiktsmessig måte å gjøre det på, hadde vært veldig bra. 19 av 20 systemer jeg har vært borti eller som jeg har hørt om, blir for ambisiøst og komplekst, og blir dermed ikke noe av. Så om man tar de viktigste tingene, så kan man få det til bedre. Jeg er redd for at vi alt for ofte er alt for ambisiøs når vi først skal gjøre det.

Vi gjør ingenting aktivt for å motivere.

For det første må det være relevant. Tilgjengelighet og implementering. Det hjelper ikke meg mye om det ligger en bra lesson på Portalen, om jeg ikke vet om den. Jeg har stor tro på enkle tiltak og enkle løsninger. Noe så enkelt som å løfte det opp til regionmøte eller noe lignende.

Andre tanker: viktig og interessant med (temaet) kompetanseutvikling i den type bedrift vi er i. Veldig kortsiktig "strategi" å fokusere kun på leveranse.

At det settes på dagsordenen på ledelsesnivå og at det prioriteres tid og tilrettelegges for å gjøres er viktig.

Det at systemet gir deg feedback på at noen har benyttet seg av det du har laget og lagret, burde gi en effekt. En "liker" funksjon hadde sikkert fungert. Bruk susksehistorier har jeg også troen på.

Tilbakemelding på antall oppslag eller antall visninger.

### **Diverse informasjon**

Arbeider både alene på prosjekter, og noen ganger i team (to/flere med ulike roller). Noen andre er utleide til jernbaneverket, statnett etc nesten som et bemanningsbyrå. De jobber ikke i prosjekter for faveo.

Vi har prøvd å innføre (system) i Faveo. (System) er en miks av Twitter og Facebook for organisasjoner. lavterskel informasjonsdeling. Ville implementere dette i portalen, men ingen i ledelsen på mitt kontor hev seg med, og da døde systemet av seg selv (ble for lite synlig).