Managing change in ERP implementation projects: A case study in an SME context

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Preface

In this study, we have investigated how small and medium-sized enterprises (SMEs) manage change during the implementation of enterprise resource planning (ERP)-systems. By giving rich descriptions of the challenges related to change management faced at one SME, we provide a better understanding of *how* change management challenges unfolded in a special context. The study was conducted in Kristiansand Skruefabrikk og Mek verksted (KSMV), an over 100-years-old SME located on the south coast of Norway, in Søgne, focusing on mechanical services. It has been frustrating and challenging, but also very interesting and exciting, to dive both theoretically and practically into the change management challenges. During our master project, the pandemic of Covid-19 had its outbreak, which affected our ability to cooperate and the possibilities to be at the research site KSMV.

This thesis marks the end of our journey towards a Master of Science degree in Information Systems (IS) at the Department of IS at the University of Agder. We wish to thank our fellow students for encouragement and enriching discussions throughout this journey. Also, we thank our supervisor, Professor Eli Hustad, for giving excellent guidance throughout our research project. We wish to express a special thanks to Lars Lohne for providing us with the opportunity of conducting the study at KSMV, for enriching discussions, and for continual support. To KSMV and our informants, we thank you for taking care of us, for your valuable time, and for sharing your experiences and knowledge. Finally, we wish to thank our family for encouragement and support.

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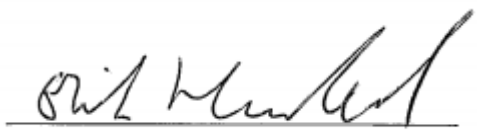

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Abstract

Organizations that implement enterprise resource planning (ERP) systems face extensive changes in their structures, core processes, and roles. These changes need to be managed for ERP implementations to succeed, making change management very important. Literature detail critical success factors (CSFs) for change management, but these receive varying relative importance depending on factors such as the size and the context of the implementing organization. Much of the research on change management in ERP implementations focus on large enterprises, and often lack empirical insight into why change management is challenging.

Kristiansand Skruefabrikk og Mek verksted (KSMV), an SME focusing on industrial production located in Søgne, Norway, implemented the ERP system RamBase in the spring of 2020. In this thesis, KSMV's ERP implementation is examined by asking the research questions 1) *How do SMEs manage change during ERP implementations?* and 2) *Why is change management challenging to tackle during ERP implementations in SMEs?*

This study uses a qualitative approach with an explanatory case study guided by the interpretive paradigm. It consists of empirical data, collected through 14 semi-structured interviews and 304 hours of observation, in addition to gathered documents. Using Nvivo, CSFs for change management identified from the literature were adopted as a framework for provisional coding in order to achieve an in-depth analysis and interpretation of the data's meanings.

The findings present 33 challenges related to change management CSFs and eight key reasons for why these challenges occurred. It identified that for KSMV, some CSFs were more important to manage than others due to the number and severity of challenges related to it. Also, many of the challenges were interconnected, and one challenge often led to or increased others. Business process reengineering (BPR) was especially challenging because it opposed the established culture within the company. Also, risk management was underestimated, which affected their ability to act proactively upon risks. This meant that many risks had to be managed as they occurred instead of mitigating them. A lack of focus on culture contributed to many of the challenges because the culture was more of an impediment than a facilitator for change management. Lack of deep engagement caused end users to be less involved, and it made communication and organizational resistance management challenging. Due to an ad-hoc approach, in combination with an all-time high workload, plans were neglected, and the project team focused on solving short-term issues rather than long-term issues. Finally, weak management, lack of holistic project view, and lack of competence in computer usage were also identified to contribute to many challenges.

This study contributes to the body of knowledge on change management for SMEs in ERP implementations. It demonstrates that challenges relate to people-issues, rather than technical issues. Specifically, it delivers rich insight into eight key reasons for change management challenges in a Norwegian context. It emphasizes the importance of risk management and the importance of considering culture, overall organizational workload, and ensuring deep

engagement. For practitioners, it emphasizes the extensive organizational changes ERP implementation causes. We also suggest that practitioners take into consideration the eight key reasons for challenges when managing change in ERP implementations.

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1. Introduction

Implementing and adopting enterprise resource planning (ERP) systems, as a research area, has gotten much attention over the last three decades (see e.g., Ali & Miller, 2017; Davenport, 1998; Somers & Nelson, 2004). An ERP system compromises software modules, which allow organizations to integrate business function processes in real-time (Davenport, 1998). An ERP system builds on best practices, and usually, the adoption of such a system causes changes in the roles and core processes of a company. In order to manage such changes, the need for change management arises. Laudon & Laudon (2017) state that a substantial percentage of IS projects stumble because the process of organizational change is not adequately addressed, and that careful change management is required. Previous research studies confirm change management as one of the most critical success factors (CSFs) in ERP implementations for large enterprises (Kim, Sadatsafavi & Kim Soucek, 2016). However, studies focusing on CSFs related to change management for ERP implementations in small and medium-sized enterprises (SMEs) have received less attention. SMEs represent the vast majority of organizations. In Norway, SMEs represent over 99% of the total sum of organizations (Statistisk sentralbyrå, 2020). We, therefore, want to investigate the concept of change management in the context of ERP implementations in SMEs. A literature review on ERP implementation challenges stated that there is a need for further research on the topic of ERP implementations concerning change management since most ERP failures relate to people-related issues rather than technology-related issues. (Ranjan, Jha & Pal, 2016). Generally, there is a call for further research on ERP implementations in SMEs (Ali & Miller, 2017), and specifically on CSFs in specific contexts (Malhotra & Temponi, 2010; Saade & Nijher, 2016). In order to address change management in the context of ERP implementations in SMEs, we pose the following research questions (RQ):

> RQ1: How do SMEs manage change during ERP implementations?
> RQ2: Why is change management challenging to tackle during ERP implementations in SMEs?

To answer our RQs, we conducted an explanatory case study in an SME working in the mechanical service industry in Norway. During the work of our master project, this company was in the process of an ERP implementation, which we were able to follow closely. The case study was interpretive, and the data collection consisted of interviews, document analysis, and observations. We used the literature of ERP implementation in SMEs as a foundation for our study, and in particular, we utilized literature on CSFs in ERP studies as a lens guiding our research.

We have throughout our journey towards a master's degree in information systems (IS) found the interaction between people and systems exciting. In particular, we find it interesting how one should have a holistic view on system implementations, and how change management, among other activities, affect the success of such an implementation in the digital era. Our motivation for writing this master thesis is to gain more in-depth insight into the IS research field and to specialize in a subject that we find highly interesting. The purpose of this thesis is

to fill a research gap in the IS field and to gain rich insight on the topic in order to help practitioners in dealing with change management of ERP implementations in SMEs.

In this report, we first present relevant literature, then a description of the case and research method, before we move on to the results and discussion. Finally, we present our conclusions, implications, limitations, and suggestions for future research.

2. Related research

In this chapter, we present the related research for change management in ERP implementations in SMEs. First, we present how we conducted our systematic literature review. Next, we present definitions of the core concepts of our thesis: ERP systems, SMEs, change management, and CSFs. Next, we present results from previous research describing factors to achieve successful change management for ERP implementations in an SME context. Finally, we present a conclusion of the relevant literature.

2.1 Literature review process

In order to undertake this study of how organizations manage change in an SME context, we have conducted a systematic literature review (Kitchenham, 2004; Webster & Watson, 2002). First, when identifying relevant literature, we required that the articles should be written in English, have an author and be peer-reviewed, along with more general quality metrics such as perceived quality, use of appropriate research methods, presenting empirical results, and explaining the limitations of the study. Webster & Watson (2002) argue that one should not choose articles based on the outlet source. Therefore, we have chosen to accept all papers where we deem the source to be of sufficient quality, as change management is researched in other disciplines than solely IS. Therefore, to find relevant literature, we included related disciplines to IS research such as Business and Social Science. In order to do so, we used the database Scopus. Our search specified the concepts *ERP* or *enterprise system* in combination with *change management*. We also limited the search to the subject-areas *Computer Science*, *Business, Management and Accounting*, and *Social Science*. This resulted in retrieving 146 papers. Figure 1 illustrates the process that followed.

Figure 1 - Overview of the exclusion process.

Figure 1 illustrates how we achieved a total sample of 20 publications. In general, when excluding papers, we applied our criteria to both titles, abstracts, and, finally, the article itself. We ensured that the papers discussed the role of change management in ERP implementations in some way. Furthermore, our evaluation process included criteria to ensure the article itself, its method, its source, and that the peer-review processes were of high quality. As figure 1 illustrates, our search got 146 results, which we narrowed down to 26. We narrowed these 26 articles further down to 11 after an extensive evaluation. We excluded articles based on both the article itself, its method, its source, and its source review process, perceived overall quality, and again that the papers discussed our intended scope. Following, we did a forward search on these 11 articles resulting in 265 articles. These articles went through a similar evaluation process as our initial search. Lastly, throughout our literature search, we found three articles extensively cited. We added these three as pillars, finally resulting in 20 articles.

The identified articles discussed a multitude of different CSFs concerning change management. We condensed these into 15 change management CSFs for a successful implementation of ERP in SMEs. These are:

- Business process reengineering
- Communication
- Company support
- End-user involvement
- Incentives
- Management of expectations
- Planning
- Project champion
- Project management
- Project teams
- Risk management
- Top management support
- Training and education
- Vision for the change

Appendix 1 presents a concept-centric matrix (Oates, 2012, p.87-88) mapping the articles against these CSFs.

2.2 ERP systems

ERP systems are information systems that help organizations work more efficiently. Usually, ERP systems are a collection of integrated applications that allow data sharing across all departments in real-time. Malhotra & Temponi describe ERP systems as, "*Enterprise Resource Planning (ERP) systems integrate all information and processes of an organization into a coalesced system that concerns how people and organizations access, collect, store, gather, summarize, interpret, and use information."* (2010, p.28). ERP systems were introduced in the early 1990s', and Davenport (1998) argues that ERP counts as the most important development in the corporate use of information technology in the 1990s'. Ever since the 1990s', the technology has been developed at a rapid speed. In recent years, the number of SMEs that have adopted such systems has increased (Olson & Staley, 2012). Further, ERP systems are not a software suite, but rather a way of doing business (Marsh, 2000), as it includes a pre-defined way for the organization to collaborate through the system.

2.3 Characteristics of the SME context

SMEs represent the majority of organizations worldwide, and they differ from large enterprises in that they employ fewer people and have lower turnover. However, there is no single definition of the classifications of SMEs. The EU commission defines SMEs as an organization that employs 250 or less and have an annual turnover of less than 50 million euro (European Commission, 2020). In contrast, the Norwegian Government and Statistics Norway usually refers to SMEs as organizations that employ less than 100 people (Departementene, 2019).

Nevertheless, SMEs represent the majority of organizations in both the European and Norwegian context. SMEs are typically distinguished by their informal structures and culture (Mintzberg, Ghoshal, Lampel & Quinn, 2003, p. 217), which are in contrast to larger enterprises. In SMEs, there are usually resource constraints (Saad et al., 2006), top management is more involved in day-to-day activities (McCartan-Quinn & Carson, 2003), and they, in contrast to large enterprises, face more significant challenges when adopting technology (Shin, 2006). Moreover, the literature suggests that such differences affect the relative importance of factors for successful ERP implementations (Snider, da Silveira & Balakrishnan, 2009).

2.4 Change management

Change management is an interdisciplinary research area. However, there are some definitions and theories that most disciplines have adopted. First, with change management, it is accepted that one must work with multiple organizational elements at once and that these elements should be given equal attention (Iden, 2018, p. 112). The Leavitt Diamond introduced four such elements that relate to change management: Structure, technology, tasks, and people (Leavitt, 1965). Furthermore, most of the change management theories describe three stages: unfreezing, moving, and refreezing, such as Kotter's 8 steps for change (Kotter, 1996). Moreover, change management relates to managing *something* from the current state towards a wanted state (Brochs-Haukedal, 2010, p.332). In order to do so, one must first understand *something's* current state in addition to the means that change *something* towards the wanted state.

2.5 Change management in ERP implementations

Introducing an ERP system relates to changing *something*, often technically and structurally, and related to processes and people, from an existing state towards a wanted state (Aladwani, 2001). Such changes often have a powerful organizational and behavioral impact (Laudon & Laudon, 2017, p. 590). Also, the change from the current state towards the wanted state is a lengthy and complicated process. It involves changes in culture and how people work (Jiwasiddi & Mondong, 2018). Thus, the need for change management arises. Some even argue that failure in change management is the main reason for ERP implementation failure (Almajali & Tarhini, 2016). Change management is critical for ERP implementations (Lee & Pai, 2003; Robey, Ross, Boudreau, 2002), and for change management to be successful, one must consider several factors. Literature suggests a variety of different CSFs such as communication, end-user training, top management support, and more. The CSFs that the literature suggests are important will be further detailed when we present the findings from our systematic literature review.

2.6 Critical success factors

The concept of CSFs is widely utilized. Ever since it was first mentioned in the context of information systems (IS) late in the 1970s, it has been adopted as a term to address variables that managers must handle adequately to fulfill organizational goals (Forster & Rockart, 1989, p. 1). By identifying CSFs, managers can give the necessary attention to the critical areas in order for implementation processes to be successful (Rockart, 1979). Rockart (1979) also argued that such CSFs differ depending on what managers perceive as important based on the

context. In ERP implementation literature, CSFs have been widely adopted (see e.g., Akkermans & van Helden, 2002; Somers & Nelson, 2004).

2.7 CSFs for change management in ERP implementations in SMEs

Our literature review resulted in 15 condensed CSFs that will be further detailed in this chapter. These CSFs represent what one should focus on when pursuing change management in ERP implementations in SMEs. Furthermore, we have used additional literature identified after we conducted our systematic literature review when presenting the literature on CSFs for change management in SMEs.

2.7.1 Business process reengineering

BPR is using the possibilities of information technology to redesign business processes to improve performance (Hammer, 1990). In our context, this means a restructuring of the company, new roles for employees, and reengineering of existing processes, as the result of the ERP implementation. In such work, companies must engage in collaboration across departments (Kwak, Park, Chung, & Ghosh, 2012). BPR is important because it results in structural changes, which is also necessary when implementing an ERP system in order to take full advantage of it. Malhotra & Temponi (2010) argue that during ERP implementations in SMEs, it is critical that the business processes are understood in order to create an implementation that is in harmony with the users. Also, if there are no changes made to processes, responsibilities, and tasks when implementing a new system, it is likely that the ERP system will not yield the expected results as the company's business processes may not be a fit with the system (Žabjek, Kovačič & Štemberger, 2009). BPR is also especially important for SMEs, as it is more critical for them to adjust to the system because the investment often carries a much higher risk (Shaul & Tauber, 2012).

2.7.2 Communication

Many of the identified articles extensively discuss the importance of communication. This factor is very comprehensive and includes all communication in the implementing company, from communicating the change to end-users to communication about the project during the implementation. Thus, it is tightly coupled with vision for the change as the vision needs to be communicated to the company to give employees a realistic and correct impression of the change. This factor is especially important for companies in order to fight resistance and remove negative attitudes early (Malhotra & Temponi, 2010; Van-Hau & Kuzic, 2010). Effective communication is important at all levels of the company, both before, during, and after the implementation (Van-Hau & Kuzic, 2010). Effective communication should also be a top priority in change management (Malhotra & Tamponi, 2010). Communication between management and employees in the SME context is typically close and informal, therefore, there is often less planned communication for SMEs, and the communication strategy is often more ad-hoc (Malhotra & Tamponi, 2010). Also, Snider et al. (2009) argue that in SMEs, it is more important to inform employees of when they are needed in a project than informing them about the progress of it. The means of communication will vary a lot in different organizations and depends on what communication strategy the company uses (Kim et al., 2016).

2.7.3 Company support

Company support means having the overall support of the company, including top management support. The support of the rest of the company may prove to be equally important for success as support from the top management (Schniederjans & Yadav, 2013). For the implementation to be successful, the company needs the support of all parts of the company (Razmi, Sangari & Ghodsi, 2009). Especially if the leadership is not supported in the organization, then it is very likely that the project will not be successful (Schniederjans & Yadav, 2013).

2.7.4 End-user involvement

End-user involvement means including those who will use the system. This factor has significant overlap with other factors such as communication and training and education, as these are both ways of including users. End-user involvement, however, also emphasizes including users in decision-making issues and asking them for input about the change and possibilities (Kwak et al., 2012). It is essential to include everyone who will or might be an end-user because they may have valuable input (Hasheela-Mufeti & Smolander, 2017). Early involvement of users can make sure that they understand the new business processes better (Hasheela-Mufeti & Smolander, 2017), and that the transition is smooth.

2.7.5 Incentives

Incentives are meant to motivate employees to accept the change and to take part in it provided that they are getting something in return after or during the implementation (Park, 2018). Incentives should be given if the implementation is successful within defined time and budget goals (Doom & Milis, 2009; Fui-Hoon Nah, Lee-Shang & Kuang, 2001). Using such incentives is important because it can help to create awareness of the change, and it also helps to develop strong feelings toward accepting and adopting new systems (Van-Hau & Kuzic, 2010). During significant company changes, employees often have to work harder and more in order to recover to regular business after change initiatives and to achieve higher effectiveness. If employees do not receive any compensation for this, they may not be willing to contribute more in the period of the change when they are needed the most (Park, 2018). In essence, the use of incentives is meant to develop some level of motivation for the employees to contribute. However, in an SME context, such motivation may be hard to motivate by economic incentives due to SME's resource constraints (Malhotra & Temponi, 2010).

2.7.6 Management of expectations

Management of expectations should focus on giving realistic expectations for the change (Razmi et al., 2009). If the change is oversold, the implementation risks failure to meet expectations even though the company as a whole contributed positively (Somers & Nelson, 2004). Management of expectations is important throughout the entire project, from initiation to the adoption of the system (Somers & Nelson, 2004). Unrealistic expectations can also lead to unforeseen expenses and consequences (Shaul & Tauber, 2012).

2.7.7 Organizational resistance management

With any implementation of an ERP system, a certain amount of resistance is expected (Malhotra & Temponi, 2010). Understanding what causes resistance to change can be a difficult task (Drummond, Araujo & Borges, 2017). Resistance may be caused by different views among the stakeholders, different interests of end-users (Drummond et al., 2017), the size of the company, and the geographical placement of the company (Malhotra & Temponi, 2010). Often end-users fear that the implementation will make their job harder, affect their status, and affect their importance in the company. This may, in return, lead to additional resistance to the change among the users (Shaul & Tauber, 2012). In order to deal with this, companies must utilize adequate strategies for change management (Malhotra & Temponi, 2010). These can be different strategies in combination, such as a good communication strategy, creating a vision for the change, incentives, and more (Malhotra & Temponi, 2010; Park, 2018).

2.7.8 Planning

Planning describes a *how* approach as opposed to a *what* approach to project management. This factor includes the planning of the implementation, and the importance of starting early with the planning and planning far ahead is especially emphasized (Hasheela-Mufeti & Smolander, 2017). Clear and systematic planning is also especially important in change management processes (Van-Hau & Kuzic, 2010). Doom & Milis (2009) present elements that ERP planning should contain:

- Description of the project goals that are realistic in terms of quality, time and money
- Scope of the project: processes affected by the ERP implementation, ERP modules, and ERP customizations
- Project plan with phasing and critical paths
- Milestones and deadlines
- The resources plan
- The organization of the project follow-up
- Contingency measures

2.7.9 Project champion

The project champion is someone who helps push through the change and keeps everyone motivated for the task at hand (Reitsma & Hilletoft, 2018). The project champion will typically be chosen by top managers and will, along with the project manager, help lead the implementation (Razmi et al., 2009; Schniederjans & Yadav, 2013). A project champion is especially important in ERP implementation as opposed to other IS implementations (Razmi et al., 2009). The project champion CSF is mostly mentioned in the large enterprise context, indicating that it may not be equally important in the SME context. The reason why the project champion is not mentioned as much in the articles concerning SMEs might be because of the smaller distances between the employees, enabling more frequent communication between

them and managers. This is opposed to large companies as it is a lot harder for managers there to directly communicate with employees, raising the need for a project champion among them.

2.7.10 Project management

Project management is a broad CSF and includes a lot of different aspects (Doom & Milis, 2009). It should focus on objectives, tracking of projects, and planning related to work and resources (Reitsma & Hilletofth, 2018). Due to the complex nature and the risk of implementing an ERP system, good project management is crucial from the initiation of a project until the project is over (Somers & Nelson, 2004). Not understanding project management fundamentals can lead to negative consequences for the implementation and at worst failure (Ehie & Madsen, 2005; Hustad & Olsen, 2014).

2.7.11 Project teams

Project teams are an important aspect of ERP implementation, and the number of teams will vary in different organizations, depending on their size and complexity. Project teams are also important for the success of the project management factor because they are responsible for planning, scheduling, and assigning responsibilities for the various tasks concerning the project (Umble, Haft & Umble, 2003). This makes this factor extremely important, and the teams should be put together carefully and with the task at hand in mind. The teams should consist of highly qualified people with decision-making responsibilities (Reitsma & Hilletofth, 2018; Umble et al., 2003).

2.7.12 Risk management

Risk Management is how the company handles the risks related to the implementation of an ERP system. Risk management is considered a very important factor for ERP implementation as it describes the potential pitfalls and their consequences, ignoring these can at worst lead to failure (Malhotra & Temponi, 2010; Shaul & Tauber, 2012). Risk management is important because adopting an ERP system often brings significant risks, and the management of these can be crucial to the success of the ERP implementation (Kim et al., 2016). Literature shows that the risk is even greater for small companies because they often work with volatile cash flows, making the investment even bigger for them and the pitfalls greater (Malhotra & Temponi, 2010). Risk management is particularly important for SMEs because few SMEs have the resources to address all success factors related to ERP implementation (Shaul & Tauber, 2012). The greater the risk is, the better the reward of handling the risks are (Malhotra & Temponi, 2010). Therefore, it is important to weigh the risks against potential rewards before making a decision on whether to adopt ERP and how to do it. Because of limited resources in an SME context, SMEs must carefully assess the risks and carefully make compromises due to resource constraints (Shaul & Tauber, 2012).

2.7.13 Top management support

Top management support is one of the most prominent CSF identified in our literature review, and most of the articles mention it as very important (see e.g., Finney & Corbett, 2007). Thus,

this factor is one of the most critical ones. Top management support can be described by the following factors (Venugopal & Rau, 2011):

- Senior management leading by example
- Allocation of resources as needed on time
- Repeated communications on the importance of the project
- Inter-departmental/process conflict resolution
- Continual monitoring and redirecting through an effective steering committee process

Top management, along with change management, is important in each step of an implementation (Žabjek et al., 2009). Other studies that focused on what causes failure in ERP implementation also mentions a lack of top management support as one of the most important factors for failure (Umble et al., 2003) The success of an ERP implementation will depend on the commitment from the leadership (Dezdar & Ainin, 2011). Ensuring commitment to the change can be done in several ways and is coupled tightly with proper handling of the other CSFs such as good communication, adequate training, and resistance management.

2.7.14 Training and education

Throughout the literature, there is a consensus that training and education is very important during ERP implementations (see e.g., Al-fawaz, Eldabi & Naeseer, 2010; Reitsma & Hilletofth, 2018; Somers & Nelson, 2004; Park, 2018). Also, Umble et al. (2003) argue that training and education is the CSF that is most widely recognized. Training is especially important to ensure user acceptance of the new system and has moderate importance when it comes to the later stages (Somers & Nelson, 2004). Training is also important when it comes to fully exploiting the functionality of the system (Shaul & Tauber, 2012). This argument is backed up by Umble et al. (2003), who states that the full realization of benefits from the ERP cannot happen until the system is used properly. Training and education should start at an early stage even though this often is not the case as implementing companies often underestimates the amount of training that is necessary (Umble et al., 2003).

2.7.15 Vision for the change

Vision for the change in this context includes both vision in terms of what the company wishes to achieve overall in the long term, and clear goals and objectives during the implementation. Many of the articles emphasize the importance of clear goals and objectives in giving direction to the project and driving the change (Fui-Hoon Nah et al., 2001; Kim et al., 2016; Somers & Nelson, 2004). The Vision is also especially important in order to remember the purpose of the implementation throughout the different stages of the project (Somers & Nelson, 2004). A clear vision for the project can be especially important when deciding whether to start such a project or not, because it tells the decision-makers what they can achieve (Kim et al., 2016). Clear goals and objectives will also help the company keep the focus on business benefits they wish to achieve throughout the implementation (Fui-Hoon Nah et al., 2001).

2.8 Literature review conclusion

The literature study identified change management CSFs in both SMEs and large enterprises across different contexts. There is a significant overlap of identified CSFs in SMEs and large enterprises. The relative importance of the CSFs varied across these studies. However, a consensus among these studies was identified as regards the most important CSFs, which comprised the factors of top management support, communication, training and education, and project management. These factors were extensively mentioned in the articles we reviewed, and the authors of the respective articles have emphasized the importance and contribution of the specific factors. However, we see that some factors outside the top four do not have the same importance in SMEs as in larger enterprises. The project champion, for instance, is more frequently mentioned in large enterprises, while risk management is mentioned more frequently in the SME context. In addition, the specificities of the SME context seem to affect the relative importance of the CSFs. Moreover, the relative importance of CSFs might differ across contexts due to what managers perceive as crucial in a particular context (Rockart, 1979). In conclusion, the majority of the studies under review demonstrated divergent views as regards the relative importance of the CSFs.

There are several calls for future research on change management during ERP implementations in SMEs (see e.g., Ali & Miller, 2017; Malhotra & Temponi, 2010; Ranjan et al., 2016), and more specifically, there are calls for such research to focus on CSFs in specific contexts (Saade & Nijher, 2016; Doom & Milis, 2009; Hasheela-Mufeti & Smolander, 2017). Moreover, previous studies suggest future research to focus on giving deep insight, instead of providing a long list of identified CSFs without providing an understanding of what is behind each factor (see e.g., Akkermans & van Helden, 2002; Van-Hau & Kuzic, 2010). Finally, there are calls for future research to focus on the impact of culture during ERP implementations in SMEs through case studies (Doom & Milis, 2009; Drummond et al., 2017). Our master project seeks to bridge these gaps and aims to provide insight about how an specific SME in the context of a manufacturing firm, manage change during an ERP implementation. We investigated cultural issues of this company's context to understand how these made impact on the implementation outcome. We also seek to understand the reasons why change management is difficult to tackle.

3. Case description

In this chapter, we present relevant contextual information regarding the company in which the study was conducted. First, we provide a brief introduction of the research context, which is Kristiansand Skruefabrikk & Mek verksted (KSMV), followed by some of the key characteristics of this firm. Finally, we present the ERP system the company implemented (RamBase) and why this system was selected.

3.1 A brief introduction to KSMV

The study is conducted in an SME context. The research site is a mechanical service company. The company, KSMV, was founded in 1918, and it was owned by the same family for 99 years. In 2017, KSMV was sold to the Otterlei Group (Otterlei Group, 2020) to avoid bankruptcy. Over the last 100 years, KSMV has been focusing on providing customers with traditional machining and mechanical services. With technological advances, KSMV dedicates much of its success to investments in modern Computer Numerical Control (CNC) machines, which has enabled them to serve both national and international customers. Also, most of their current customers belong to the oil, gas, and subsea segments. (KSMV, n.d.).

In general, KSMV has had a low turnover rate, and many employees have worked there their entire careers. However, due to the company's dependency on the oil market, they had to lay off employees due to the global financial crisis in 2008. Currently, KSMV has 98 employees who work permanently and 20 employees that have temporary contracts. In 2019, KSMV had a revenue of 213 million NOK, an operating income of 12 million NOK, and a net profit of 7 million NOK. In contrast, the revenue was nearly half of this, and the net profit was negative, in the year of 2018, 2017, and 2016 (Proff, 2020). This shows the growth KSMV experienced in recent years. In addition, KSMV experienced that the market became more competitive than earlier. In order to better compete in the market, KSMV made a transition from a project-oriented production with customized products towards a standardized production consisting of mostly standardized products.

3.2 Contextual characteristics of KSMV

As KSMV was owned and managed by the same family for nearly 100 years, it has acquired some characteristics we want to describe. First, the family focused on employing locally and tried to contribute to the local society instead of gaining net profit. This philosophy created an environment with a lack of focus on efficiency, conflicts were neglected, and people were hired based on personal relationships rather than experience and knowledge. Also, the typical career path allowed employees without experience and management education to become managers. As a result, the management was not optimal for making necessary guidelines and handling conflicts. Bad habits were developed, resulting in workarounds, extended breaks, and less efficiency. After the new owners acquired KSMV, new personnel were hired, and many of the new employees had experience from professional manufacturing environments. Often, these new employees were familiar with computer usage, efficiency metrics, and more formalized management practices. When these two different types of employees met, it caused some conflicts as the way KSMV had been doing business for the past decades was questioned. The

core competencies and work activities of KSMV have been quite stable over the years, and the company had little experience with changes such as radical innovations. Therefore, the implementation of a new ERP system was a large and new undertaking for this company.

3.3 The role of information technology in KSMV

KSMV has historically not utilized IT systems to its full potential. One of our interviewees stated that they first started to use computers in the early 2000s. Before the implementation of RamBase, they used Visma Business. However, it was manually updated by only a few selected employees, and the system was not adequately implemented, in addition to employees avoiding it. Information was distributed among different technical solutions, and there was not a single source for master data. In addition to Visma Business, information was dispersed across emails, shared windows folders, single computers, personal folders, and non-digital solutions (paper-based). With the project-related production, this worked fine as production was oriented around the particular project, but with the standardized production, the previous ERP solution became unmanageable. The company experienced that in order to scale the production, the technical solution had to be changed. With the project-related production, all aspects of the production were managed by a manager. The manager was responsible for sales, procurement, production, logistics, invoices, customer relationship, and all other parts of the process regarding each project. There were, in addition to departmental silos, also silos between the projects. Coordinating production according to plan was challenging because the different managers would independently micro-manage the production. When changing to standardized production, the company was not able to run its new way of business with the old system. This was one of the main reasons why KSMV decided to implement a new ERP solution, and RamBase was selected for this purpose.

3.4 Background for the ERP implementation

KSMV knew that their old processes were outdated and that they did not fit with a standardized production approach. It was decided that an ERP system focusing on production must be implemented. There were several issues that the implementation of such a system would solve. Sales, procurement, production, document management, logistics, quality control, and finance would be coordinated. Such a change would cause a dramatic change in KSMV, its processes, structure, and, more generally, its way of doing business. Everything had to be coordinated. E.g., procurement would have to be based on the current inventory and coordinated with the plan for production and further scheduled according to customer delivery. Visma Business did not include functionality regarding production. It lacked functionality for, e.g., calculating the need for inventory based on orders, and it was not able to propose a plan for production based on sales, procurement, and customer delivery. As a result, deliveries were often delayed, and it affected KSMV's ability to stay competitive. Thus, a need for an ERP system that fits an environment with standardized mechanical manufacturing emerged, and the company decided to select RamBase as the new ERP solution.

3.5 RamBase: An ERP focusing on mechanical manufacturing

RamBase is a cloud-based Software as a Service (SaaS), ERP system, ran on a multi-tenant solution. Local customizations are hard to implement because it would be implemented for all of RamBase's customers due to them multi-tenant solution (Krebs, Momm & Kounev, 2012). Also, RamBase is based on a platform technology that takes advantage of API technology in order to seamlessly integrate external applications with it (RamBase, 2020a). Moreover, it is a complete material requirement planning system (MRP) (RamBase, 2020c), making it a good fit for production companies. RamBase proposes a series of benefits for mechanical manufacturing. First, it enables documents, certificates, drawings, and measurements to be attached at all stages of the workflow. It also gives an overview of all phases of a product life cycle, from procurement of parts to manufacturing and delivery. In addition, it provides version and revision handling with a complete log of changes. (RamBase, 2020b).

4. Research approach

In this section, we present our research perspective, followed by an explanation of our research method. Next, we introduce our pre-study. After that, we present our case study, including data collection, data analysis, and we discuss validity and reliability, and ethical issues. Finally, we present our role as researchers, and we discuss the methodological limitations.

4.1 Research perspective

In this chapter, we present our philosophical paradigm, which is motivated by our ontological beliefs and epistemological assumptions. In general, there are three different philosophical paradigms: positivistic, interpretive, and critical research. Positivistic IS research seeks generalization from representative samples to a population (see e.g., Benbasat, Goldstein & Mead, 1987). Critical IS research does not seek such generalizations. Instead, it challenges the status quo and seeks to empower people (Oates, 2012, pp. 292- 297). We have chosen to follow the interpretive paradigm in our research. As interpretive IS researchers, knowledge of reality is gained only through social constructs (Klein & Myers, 1999). Furthermore, interpretive research attempts to understand the phenomena through the meanings that people assign to it (Orlikowski & Baroudi, 1991). We put forward that knowledge is a social construct, and in our research, we try to understand different perceptions through our data collection. Thus, we argue that we were able to get a deep understanding of, and to examine the challenges faced by an SME when adopting an ERP system with regards to change management CSFs. By doing so, we have tried to give rich insight into *how* the challenges unfolded in this context. We believe that the underlying paradigm enabled us to identify, explore, and explain the challenges experienced at KSMV. As researchers, we developed such understanding through interpretations of our observations and our informants' explanations of their perceptions. We collected multiple subjective perceptions of the challenges and combined these with our interpretations.

4.2 Research design

Because we had already conducted a pre-study at KSMV, we were lucky to be able to work with them again and study their implementation of an ERP system, which happened in the same period as our master study. A case study approach was adopted. Figure 2 illustrates the main components of our case study design.

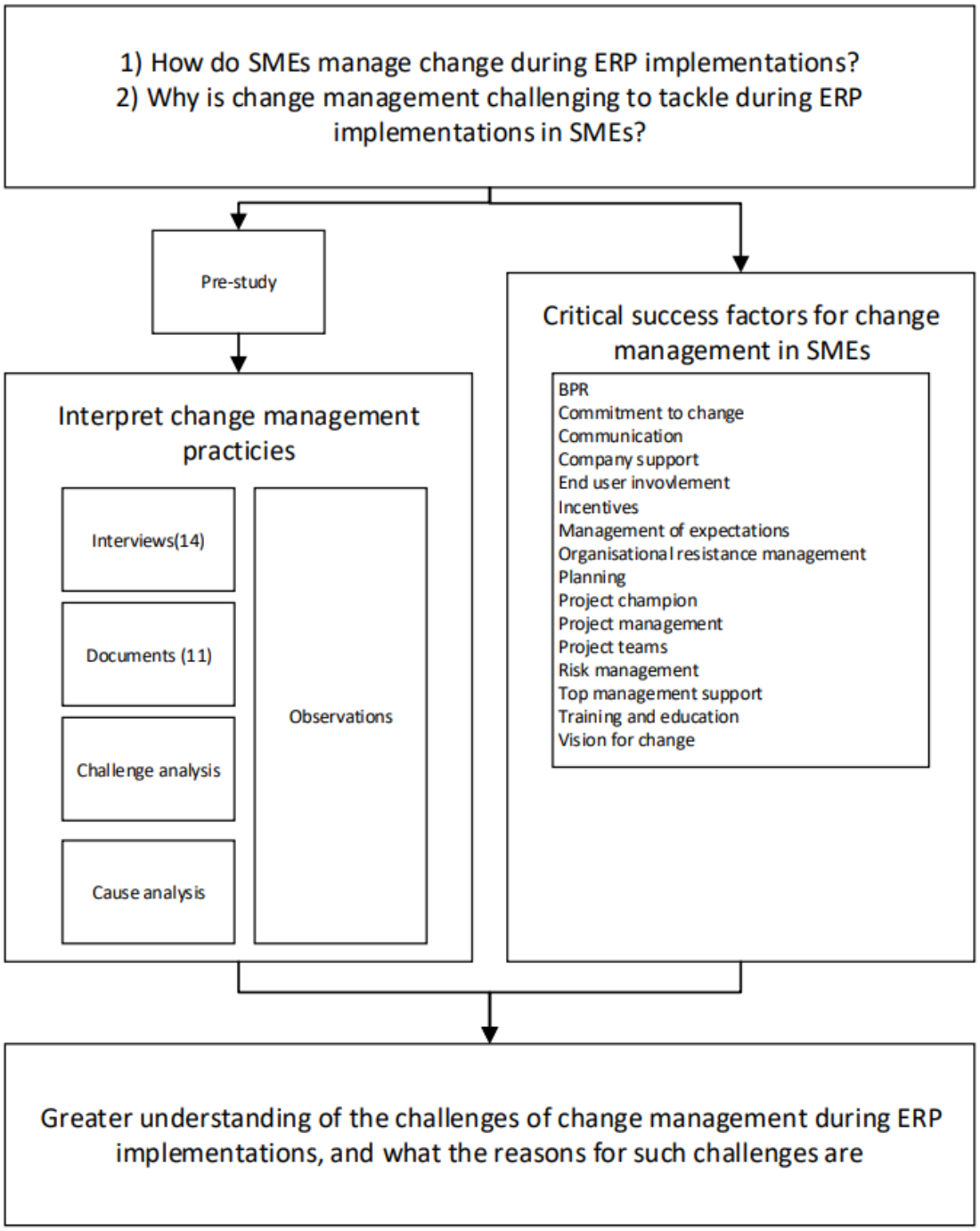

Figure 2 - Research approach based on Dubé & Robey (1999).

In order to investigate the challenges of handling CSFs in an SME context, we applied an interpretive case-study approach. Building upon experiences drawn from our pre-study, we used interviews, documents, and observations to empirically detail how an SME experienced challenges with change management during their ERP implementation. As we wanted to investigate the challenges related to CSFs, we argue that this approach and selection of case was right as it enabled us to further explore interesting data, e.g., by conducting additional interviews as a result of the snowball sampling (Tongco, 2007).

4.3 Pre-study

During autumn 2019, we conducted a pre-study comprising a literature review of relevant ERP research for our purpose. In addition, we conducted 3 interviews in KSMV that helped us to empirically position our main study. The pre-study was part of our course work in autumn 2019 (University of Agder, 2019a; 2019b). The results from the pre-study, constitute a basis for our master thesis. In our pre-study, we sought to answer how KSMV facilitated for successful change management in the implementation of RamBase. Therefore, we were already familiar with the organization before starting the master thesis. We used insight gained from our initial interviews when we created our interview guide for the master thesis. Also, experiences were gained from conducting the interviews during our pre-study. For example, we learned how to prepare ourselves for interviews, how to speak, and how to appear appropriately. This helped us to conduct interviews in an appropriate manner during our study.

4.4 Case study

This study utilized an explanatory case study approach. Case studies are characterized by that a phenomenon is examined in a natural setting, multiple means are used to collect data, and the complexity of the phenomenon is studied intensively (Benbasat et al., 1987). Yin (2003) presents three basic types of case studies: exploratory, descriptive, and explanatory. Our approach is based on the explanatory case study. Such a case study can be described by as,

> *"An explanatory study goes further than a descriptive study in trying to explain why events happened as they did, or particular outcomes occurred. The case study analysis seeks to identify the multiple, often interlinked factors that had an effect, or compares what was found in the case to theories from the literature in order to see whether one theory matches the case better than others*." (Yin, 2003, cited in Oates, 2012, p. 143).

The case study approach enabled us to study an ERP implementation in its natural setting. By doing so, we were able to capture both the intent, execution and result of change management initiatives. With this approach, we sought to develop rich insight into the challenges, which Walsham (1995) argues is one of the four main types of generalizations that are possible from case study research.

4.5 Data collection

This study uses data from semi-structured interviews, observations, and document analysis. The collection of data started in January and lasted until the end of May. The data was stored in the approved storage area of the University of Agder. In total, 14 interviews, 304 total hours of observation, and collected documents represent our data. Following, we present how the different types of data collection methods were applied.

4.5.1 Primary data collection – preparing and conducting interviews

In collaboration with the project manager, interesting interviewees with profiles that represented different cultural, operational, and hierarchical functions were selected to

interview. Thus, a purposive sampling technique was applied (Tongco, 2007). There are several types of interviews, and they vary in the level of improvisation they allow. Structured interviews consist of a complete script of which there is no room for improvisation, whereas semi-structured interviews allow researchers to prepare questions, but also improvise (Fontana & Frey, 2000). By applying semi-structured interviews, we were able to change the order of questions our interview guide proposed and to ask follow-up questions easily. Although our interview guide proposed a structure for the interview, we adapted this during the interview in order to go deep, rather than briefly cover our topics.

The interview protocol was developed based on experiences drawn from the pre-study, and it adopted many of the formulations in Elstad's (2014) interview guide which looks at CSFs for implementing ERP systems, from an employee perspective. The interview protocol became narrower over time, and specific topics that were identified in initial interviews were further explored. Also, our interview guide was adapted to the interviewees' background and role before the interview, but also during the interview based on answers given. The final version of our interview guide can be found in appendix 4.

Interviews were conducted on-site, face-to-face. Establishing trust between interviewer and interviewee is very important (Myers & Newman, 2007); thus, generally, the interviews started out with giving assurances about confidentiality and anonymity and building trust. Building trust was important to get information about topics that were difficult to talk about. For example, we wanted the interviewees to reveal the challenges experienced during the project, and to talk openly about them. Following, the plan for the interview was presented, and written consent was collected (Appendix 3). During the interview, the interview protocol acted as a guide, but follow-up questions and discussions mostly occupied the time. When closing the interview, we asked who else the interviewee would recommend for us to interview, which is known as the snowballing technique (Myers & Newman, 2007, p. 14).

In total, we conducted 14 interviewees with 13 different people. Our interviewees represented all of KSMV's core departments, sales, human resources, project, operations, digital analysis, planning, and sourcing & procurement. Furthermore, the interviewees represented different ages, gender, duration of employment, involvement in the implementation, role in KSMV, knowledge of ERP systems, and level of education. Finally, both the management and operational levels were represented. When considering the richness of our data, we concluded that we had reached the saturation point after 14 interviews. Data saturation is the point where new data tend to be redundant compared to the data already collected (Grady 1998, p. 26). Table 1 shows an overview of our interviews. Interviewees are kept anonymous due to privacy concerns.

Interviewee	Month	Length in minutes	Round
1	January and March	34 and 49	1 and 3
2	February	37	1
3	February	57	1
4	February	21	2
5	February	23	2
6	February	51	2
7	February	54	2
8	February	49	2
9	February	35	2
10	February	39	2
11	February	67	2
12	February	19	2
13	March	43	3

Table 1 - Overview of informants.

4.5.2 Primary data collection - observations

In addition to interviews as a data generation method, we used observations. As stated, 304 hours of observations were conducted between the 9th of January and the 10th of May. These hours represent the total sum of observations, of which we did roughly half each. Usually, we were present at the same place, observing the same setting, which provided a greater richness of our data (Benbasat et al., 1987). During our pre-study, we also used observations as a data generation method. The observations from the pre-study provided us with valuable information that supported the data collection and interpretation in the main study and helped us steering the focus of our study.

Early on, we shadowed employees in order to see how they did their job and to develop an understanding of how the organization operates. We observed how the production processes worked, from start to end, starting with goods reception, warehouse stocking, quality assurance, production, machining, fabrication, assembly, packing, and shipping goods. Furthermore, we observed how they worked with procurement and sales, and we became familiar with their project-oriented production. In general, we did not plan the execution of our observations before we conducted them. For instance, we would get invited by the project manager to attend as observers in meetings ad-hoc, one day before or on the same day of the meeting. Most of the meetings were the employees' introduction to RamBase, and it was aimed at different departments. During these meetings, we were able to observe how employees interacted, communicated, and reacted during the initial introduction of RamBase. We were also able to participate in multiple project team meetings. These meetings would often deal with project

progress, technical-related issues, and participants discussed whatever needed attention at the time. There were, to our understanding, rarely a predefined agenda, and it was often decided on an ad-hoc basis. Still, we were able to listen to and observe key aspects of the project management. These observations gave us insight into how initiatives were planned, how issues were solved, and their way of managing the project. We became familiar with how the project team worked, and we got hands-on experience on the external consultants' role in the implementation of RamBase. Moreover, as we were hired as ERP implementation assistants, we were able to conduct weekly observations averaging eight hours a week each. Altogether, our observations ultimately gave us valuable insight into why RamBase was implemented, and we got hands-on experience in communication, interaction, project management, and work culture (Table 2).

Activity	**Description**	**Duration**	**Key insight**
Go-live celebration	Joint celebration of the go-live date on new ERP system with cake and non-alcoholic beverages. Speech by the project manager, small-talk and common recognition of work	2 hours	Communication, hierarchy, community groups, project progress, future plans, engagement and motivation
RamBase training	Interactive training lectures on what RamBase is and how it works with focus on the respective department	5 times, 1-2 hours duration	Communication, BPR, employees understanding of ERP
Ad-hoc RamBase training	Focus on solving day-to-day tasks are solved in RamBase	Almost every day when present	Employees system knowledge, communication, motives, motivation, engagement
Wine-lottery	Execution of the monthly wine-lottery in the cantina with non-formal conversations	Once, 1 hour	Culture, interaction, hands-on experience of the community
Lunch	While at lunch, we were able to talk and get to know employees at KSMV that we otherwise would not get introduced to.	Every day present at KSMV	Work environment, atmosphere, community, insight on everyday issues across all functions, personal insight, interesting conversations
Project meetings	Planned meetings to discuss the progress and management of the project with the project	3 times, 1-4 hours duration	Project management, risk management, consultant

	manager, project team and stakeholders		role, project team, project progress
Ad-hoc project meetings	Meetings within the project team, often with the external consultant and a manager, to discuss and resolve a particular problem recently presented.	Many times, usually 30 minutes up to two hours	Project management, risk management, consultant role, project team, project progress
Coffee-talk	Non-formal conversations with employees about anything	Every day present at KSMV	Culture, relationships, management
General work observations	While working, we were able to capture how people interacted, issues that arose and how these were dealt with, and in general get familiar with KSMV; its culture, people and processes	Every day present at KSMV	Culture, motivation, work ethics, operations, management, employees

Table 2 - Summary of observations.

4.5.3 Secondary data collection - documents

As a secondary data source, brief project plans, organizational charts with hierarchies and role descriptions, and communicated documents such as PowerPoint presentations, posters, and emails were gathered. Table 3 summarizes the documents collected.

Document	**Type of document**	**Description**	**Reason for inclusion**
Risk matrix	Excel sheet	Risk matrix with scores for impact and likelihood.	Insight into risk management
RamBase introduction	Powerpoint presentation	Powerpoint used in the introduction of RamBase for all employees	Insight into how the change was introduced and communicated
Organizational chart	Poster	Updated and detailed hierarchy organizational chart describing departments, titles, roles and responsibilities for the entire KSMV	Insight into roles and responsibilities, and how the organization is organized
Health, safety & environment (HSE) poster	Poster	Poster about how to reduce risk and improve safety	Insight into work ethics, culture, and how HSE is insured

Sales project report	Report	These reports report the progress of machining on specific projects with project details, and they are taped on nearly all items at the warehouse during production	Insight into the manufacturing, assembly, and what type of data is created throughout the manufacturing process
KSMV world class leading partner	Poster	Self-promoting poster	Insight into vision, claims, and how KSMV wants to be viewed
RamBase knowledge center	Website	Website used for self-training	Insight into training of employees
Part description document	Document	Part descriptions, often with reference to a project or procurement	Insight into how the warehouse runs
Email exchanges	Emails	As employees, we got insight into internal emails and how they were exchanged between employees	Insight into how tasks were resolved, language used, culture and ethics
Interviewees background summary	Email	Brief summary of the interviewee's background	Enabled us to adapt the interview guide and to better prepare for our interviews
RamBase info screen slider	Slideshow at info screen	Brief summary of RamBase through a slideshow ran at different info screen (TVs) throughout the warehouse aimed at all employees	Insight into how the change was communicated and language used with reasoning for the change

Table 3 - Overview of documents gathered.

As table 3 shows, a variety of documents were collected. With these documents, a more thorough understanding of the context was achieved, resulting in richer descriptions.

4.6 Data analysis

As we, through our approach, collected a variety of types of data, we have analyzed these structurally using Nvivo 12 Pro (QSR International, 2020). We analyzed the qualitative data using coding. Through coding the data, we were able to reflect upon the data, and achieve a deep analysis and interpretation of the data's meanings (Miles, Huberman & Saldana, 2013). Using the CSFs from our literature review as a framework, the CSFs were created as codes in Nvivo prior to starting the process of coding our data. Thus, a provisional coding approach was

applied in order to map the data to our predefined CSFs while still being open for new factors (Miles et al., 2013).

With such inductive coding, we were able to add new codes, re-evaluate codes, and finally combine those that were similar, all while still coding directly on our CSFs. We first transcribed the full content of our interviews. Next, when coding the transcripts, we adopted the pair programming methodology (Sommerville, 2016, pp. 83-84), where we switched between the two different roles, driver and observer. This method enabled us to continually incorporate our observations by discussing our interpretation of the data while arguing for how the topic discussed was observed when collaborating on the coding, which captured greater richness and accuracy of the data (Benbasat et al., 1987). Also, the purpose, execution, and result of change management efforts were examined by incorporating observations from both management and operational level. Furthermore, due to the interpretive qualitative data analysis, we were able to better elaborate and detail on how these challenges presented themselves. Also, throughout our analysis, we focused on how the context of the implementation affected the challenges. The context related data was captured with codes developed, such as history and culture. With this approach, we were able to gather extensive empirical data related to each of the CSFs, which later were further analyzed (Table 4).

Name of node	Files coded at	Sum references	Coded words
Business process reengineering	14	76	12492
Challenges	14	65	9304
Commitment to change	14	25	3679
Communication	14	109	14858
Company support	13	61	8929
Culture	13	86	15493
End-user involvement	14	66	9473
Important content	14	41	5346
Incentives	5	5	538
Interviewees background	11	16	2163
Consultants role	4	6	834
KSMV History	13	41	7267
Management of expectations	14	98	15224
Organizational resistance management	13	72	11622
Performance dip	10	18	2520
Planning	12	47	8425
Project champion	7	9	1112
Project history	7	14	3271
Project management	14	100	14862
Project teams	11	37	5439
Quotes	12	61	4191

Risk management	11	20	2731
SME specific challenge	4	4	365
Top management support	13	39	6313
Training and education	13	61	8948
Vision for the change	8	17	2217

Table 4 - Summary of nodes from Nvivo.

As table 4 shows, the factors BPR, commitment to change, communication, end-user involvement, management of expectations, and project management were used as a code on all 14 of our interviews, where communication was coded in total 109 times, and culture consisted of 15 thousand words with empirical data.

Further, we started to analyze each factor separately by analyzing the text coded at each of them. Using Nvivo, we were also able to query our data in order to retrieve text that had different sets of codes, e.g., quotes and communication, or other combinations. Such queries enabled us to look at data that related to multiple factors, and we saw that these often were interconnected, which can be described by that change management is a set of factors, instead of isolated CSFs. Next, once we were familiar with our data in Nvivo, we incorporated how our observations were related to the interview data, which provided the overall results of the study.

4.7 Validity and reliability

In this project, we have undertaken multiple measures in order to improve the validity and reliability of our approach. Johnson (1997) suggests that some qualitative researchers' studies are better than others and that researchers frequently use the term validity to refer to this difference. By validity, he is referring to qualitative research that is plausible, credible, trustworthy, and, therefore, defensible. Furthermore, reliability refers to the absence of random error, enabling subsequent researchers to arrive at the same insights if they conduct the study along with the same steps again (Gibbert, Ruigrok & Wicki, 2008). In order to improve such validity and reliability, we have applied multiple strategies. First, by using data triangulation, we improved the validity of the case study (Eisenhardt, 1989). Also, using three data collection methods, a case study approach, looking at the challenges from different hierarchical perspectives, and being two researchers, we have corroborated findings and thus strengthened the validity of our research.

We have tried to provide a thick and rich description of the context of our empirical data, and of change management as a phenomenon. The purpose of such a description is to create verisimilitude by giving the readers a feeling that they have experienced, or could experience, the events being described in our study (Creswell & Miller, 2000). Creswell & Miller (2000) also suggest that credibility is thus established through the lens of readers who read a narrative account and are transported into a setting or situation. Also, we have invited the reader to understand *why* and *how* we have conducted our case study through careful documentation and

clarification of the research procedures. By doing so, the transparency of the research is enhanced (Gibbert et al., 2008).

Although most of our strategies applied are concerned with internal validity, we argue that the external validity is also strengthened. However, the external validity itself was never the sole goal of such initiatives due to our interpretive, explanatory approach. By detailing the specific context providing contextual information, we invite the readers for themselves to determine the level of generalizations that can be drawn from our study based on contextual, methodological, and philosophical information provided (Gibbert et al., 2008)

4.8 Ethical issues

Some potential ethical issues arose during this study and as researchers, we have emphasized the importance of making sure to consider and take action to meet these issues. Firstly, related to unnecessary intrusion, we were careful when interviewing our interviewees about personal issues, such as how willing they were to change. We wanted to establish some level of trust before asking challenging questions. In some interviews, we felt that the interviewee was not ready for such a personal question, and we decided not to ask it. When retrieving relevant documents in our data collection process, we also faced some trouble. As the organization as a whole was already overworked, with employees regularly working overtime to maintain operations, we did not want to bother them further with multiple requests about such documents. This meant that we did not retrieve as many documents as we wanted. As we conducted a case study in an SME with in-depth interviews with the employees, there was a possibility that the identity of the interviewees could be exposed even though names and titles are anonymized. This might not be true for outsiders, but those deeply engaged in the implementation of RamBase in KSMV. This has been one of our main issues as we did not want to disclose information that was not meant to be disclosed, as it might put people in a problematic situation as a result of the publication. It would have conflicted with the information regarding privacy in the information sheet given to interviewees (Appendix 2). We argue that some of the answers and opinions that were given can be traced back to origin due to the limited number of possible employees. Thus, we have chosen not to disclose some of the opinions related to the challenges faced. We have made our utmost efforts to anonymize the interviews without removing or editing content so that it becomes biased or conveys a different meaning. In the cases where this was not possible, we did not include the data further in our analysis. With regards to quotes used throughout the thesis, we want to address that the interviews were conducted and transcribed in Norwegian, but when quoted in our thesis, were translated into English.

Lastly, as a result of the level of trust and comfort established before we conducted our interviews, some interviewees wanted us to take a standpoint on issues discussed in the interview in order to seek some sort of confirmation on their stand. These issues often included other employees or departments, but we communicated a neutral standpoint on the issues discussed.

4.9 Researchers role

As a result of our pre-study, the project manager wanted to hire both of us as ERP implementation assistants and offered us a position with a very flexible work schedule starting in January and lasting throughout the entire period of our research project. In essence, we were hired to help the project manager with different tasks leading up to and following the go-live date of RamBase. Our tasks were mainly concerned with the registration of accurate inventory in RamBase. We seldom made decisions, and our influence on the execution of the project was minimal at most. Still, we would occasionally advise the project manager on the management of the organizational aspects based on knowledge acquired throughout our years of study. We did not disclose any insight gained through our interviews.

Since we held different roles at different times through observations, in interviews, and at work, it became challenging to manage our role at KSMV. Since some referred to us as the students, some as the part-time employees, and others just as someone unknown, we had to be conscious of how to behave when in the respective roles. Oates (2012) argues that people respond differently depending on how they perceive the person asking the questions; that is, the data generated can depend on the perceived role and identity of the researcher. Thus, we did our utmost to try to be perceived as professional and polite as possible when we were at KSMV's site both as researchers as well as employees. However, we want to address that we worked tightly with the project manager, and since there already was a gap between the operational and management level in KSMV, this might have affected the perception of us. Still, we tried to take a neutral approach and seldom took a stand in arguments that dealt with the belonging of either side, that being the management or operational. Instead, we tried to get familiar with employees at a personal level in order to gain trust and respect. However, we acknowledge that the unclarity of our role, our connection with, and often through, the project manager affected the perception of us as researchers.

4.10 Limitations

In this section, we will discuss the limitations regarding our methodological decisions. The case study approach is usually lacking in the degree in which the findings are valid in other organizations or contexts. As we are looking at the change management CSFs in one specific context, the external validity is lacking due to the uniqueness of the context, which is not likely to be identical elsewhere (see e.g., Saade & Nijher, 2016; Doom & Milis, 2009; Hasheela-Mufeti & Smolander, 2017). Furthermore, we argue that the internal validity is more reliable as we applied data triangulation, gave a thick and rich description, and enhanced transparency of our research procedure. Also, using non-probabilistic sampling techniques, gave both of us, and the project manager, much power in the selection of our sample within the sample frame. However, while the effects of a probabilistic sampling technique might enhance our ability to generalize (Oates, 2012, p. 95-99), it contradicts our intent of giving rich insight, which is why we deemed non-probabilistic techniques to be best suited. Next, the findings might have been affected by our presence due to the nature of a case study approach, both in terms of that we might have developed a bias that affects our interpretation, but also concerning the interviewees, who may have communicated biased perceptions, or biased interpretations of

challenges. Furthermore, our interpretation limits itself to our extent of being able to fully understand the challenges faced during the implementation through our interviewees' descriptions of their perceptions. Finally, our assumptions, beliefs, values, and actions may have shaped the research process and affected the reported results. Thus, if other researchers conducted the study, the challenges may be interpreted differently.

5. Results

In this chapter, we present results from the case study based on our data analysis of interviews, observations, and documents. The findings presented are integrated results based on the different methods of data collection we have used. First, we present the culture, followed by each of the CSFs identified in the literature.

5.1 KSMV culture

The culture at KSMV has not changed much over the years. Implementing RamBase highlighted KSMV's change towards a streamlined and standardized production company, which the culture had not adapted to. Also, the typical career ladder allowed apprentices to move on to become supervisors, and eventually managers, without having any formal education within the area. According to interviewee 7, this created a culture of leaders that did not necessarily operate in the best interest of the company. Also, it led to much freedom among employees to do what they felt like doing. An example of consequences of this is employees freely going for several smoking-breaks without facing any consequences for working less than others. Also, there was no culture for following processes and routines. Instead, there was a culture for making shortcuts and quick fixes, which may have benefitted them in the short term, but not in the long term. Interviewee 11 stated that with RamBase, in terms of routines, they must start entirely from scratch. As a result, changes became difficult because of established mindsets, which interviewee 8 described, *"For some, it is a big, big change to start eating lunch at 12 instead of 11:30, it just does not work."* Also, interviewee 11 said, *"Some people here are ready for change as long as they do not have to change themselve*s." KSMV's culture and history with significant changes can also be summarized by interviewee 1 quoting another employee who has worked at KSMV for more than 30 years, *"Now we have done it, we are doing something new. That in itself is a revolution here at the company."*

Interviewee 2 described the culture as the biggest challenge for the ERP implementation, *"Yes, without a doubt. There is a lot of bad culture in the company. And it has grown over time, especially the last years when they [KSMV] got new owners."* As a result of the culture, the willingness of employees to take part in a change initiative was very low, and it became particularly challenging to convince the employees to be a part of the change. Thus, efforts were needed to change the culture. KSMV focused on hiring new employees that were more used to change, and they carried out conversations with employees who resisted change, in addition to several other measures made to change the culture. For instance, interviewee 8 stated,

> "*[...] such things are done here now, and with new work clothes, it builds culture. Before everyone went in a rag, a torn t-shirt, no one cared [...] But now we get the feeling of being a team because everyone is dressed the same way, and that is good*."

Another cultural aspect at KSMV was the fear of doing something wrong, described by interviewee 9, *"[...] if you did something wrong, you would have been hanged for it, rather than getting praised for trying."* Although this fear has seen a decline in recent years, it caused

employees to avoid initiating changes. Also, it became easier not to take responsibility for issues than dealing with them as employees feared the consequences of failing. This fear made the ERP implementation difficult for the employees since, in RamBase, everything should be registered, including who made the changes.

5.2 Business Process Reengineering

With RamBase, KSMV implemented the processes of RamBase. This was decided early in the ERP project, while the company still had opportunities for adjustments, as described by interviewee 2,

> *"What we said is that we will go live with RamBase out of the box and become good at using standard RamBase. If something needs to be done differently, we will have to do it ad-hoc, case by case. There are possibilities of customizing RamBase, but then we will have to make a business case in order to make changes."*

Thus, KSMV was forced to adjust its business processes, decision structures of their departments, and responsibilities accordingly. To adapt to the structure of RamBase, KSMV made several measures as described by an interviewee in the management group, "*When we were adapting to RamBase, we were early at it. We said that we needed a sales department, project department, purchase department, warehouse, logistics, and production.*" The interviewee then continued, "*This means that we need separate roles and functions, which is a big change that we are still working with*." Due to RamBase, they made a new sales department, project department, and purchase department, and the warehouse and logistics were separated. As a result, there were significant changes in the amount of responsibility among the managers. Traditionally the managers acted as sellers and project leaders, and they were responsible for procurement and customer contact. With RamBase, the managers received less responsibility and authority. Now, there are individual employees responsible for sales and procurement and specific contact personnel for customer contact. One employee at the management level said that *"The power center has been moved from managers to planners."* The alteration of power proved to be challenging as the managers showed some resistance towards the change because they lost a lot of authority and responsibility. However, the BPR was necessary, and among the project team it was perceived as a positive thing, as interviewee 11 described,

> *"The people involved in the project team has been very clear on the fact that the company needs a [new] system and to follow routines. When they get an ERP system that forces employees to follow the routines, it is a win-win situation in the long term."*

One of the most significant changes in the processes at KSMV was using a computer system as a part of the day-to-day operations. Before RamBase, computer usage experiences were lacking, except for a few employees who occasionally updated the previous system. Another challenging aspect of the BPR was to make sure that employees followed the new processes instead of falling back into old routines.

5.3 Communication

KSMV made several efforts to communicate the ERP implementation to the company. This was mainly done through information meetings, info screens (TVs), along with ad-hoc conversations and meetings with employees. Interviewee 11 described the information given like this, *"The communication I think has been pretty good for the ones that want information."*

The communication plan was heavily affected by something the project team called the *attention box*. In essence, the management believed the attention of the employees towards future events to be limited. As a result, information was given at a relatively late stage, approximately two months before the go-live of RamBase. The employees gave mixed feedback, and many of the interviewees stated that it would be better if the management provided them with information earlier. Also, interviewee 10 stated that this made it harder for employees to give feedback on the implementation because, "*We did not know what this was about except for a rough sketch."* In contrast, interviewee 8 thought the information given was good, and that they got the information they needed, "*Both [managers and others] who have been doing this have been available for providing information to us. So, it has been good information*." This may be a result of what interviewee 11 stated, that the communication has been good for the ones that want information. Also, most of the information meetings were not mandatory. Thus, the people that actively sought information found what they needed, while many that were passive did not receive much information.

One of the main challenges identified in communicating the change was to ensure that the information reached everyone. An interviewee from management stated, *"We have a challenge now that production has been called in for these information sessions, but they have not shown up. And now they are saying that they were not informed."* This challenge increased because it was mostly up to employees to receive the information. When the information meetings were held, many of the employees were not available due to the rota and different schedules.

Another challenge identified was pleasing the employees' individual need for information. While management thought that what they had planned would be sufficient, several employees wanted more. Many of the interviewees wanted to know how the change affected them, what the company gained as a whole, and they wanted continuous information about the status of the project. Interviewee 10 stated, as regards the amount of information received, *"It should have been more. You almost can't get enough information when you are implementing something like this."* Also, interviewee 9 stated, *"[The management] should have focused more on the advantages of the system, and what is expected from the different employees individually."*

5.4 Company support

KSMV seemed to have adequate company support despite a history of failed change initiatives. Historically, when KSMV has tried to go through with changes, the commitment has been lacking, as described by interviewee 5, *"It is quite unusual. We have implemented other small stuff, but then it was harder to get people in on it."* With RamBase, KSMV seemed to have

adequate company support to go through with the change. However, emerging problems have made employees skeptical and caused fluctuating support. Thus, ensuring continual company support was challenging.

The top management gave full support to the project and provided the necessary resources. Still, some of our interviewees stated that the top management support was weak and that the only thing done from top management was to initiate the project. As a result of perceived weak top management support among employees, the project received less support among employees. However, it was identified that the employees, in general, realized that KSMV needed to advance and innovate its production, thus strengthening the company's support. Interviewee 5 described it like this,

> *"[Implementing RamBase] has been going well because the old was not any good [...]. It was not a painful transition. It would probably have been different if we had something that employees felt was working well, and then changing to something new. It would have probably been a lot worse then."*

However, the company support came with some exceptions, where typically, employees who had worked at KSMV for a long time were more skeptical about the implementation of the ERP system. Interviewee 6 stated, *"I think many of those who have been here for a long time do not see the benefits of being organized through an ERP system."* The project management managed this by actively seeking to turn negative opinions and confront those who opposed the change.

5.5 End-user Involvement

Throughout the ERP project, end-users were involved through information meetings, training, and education. Also, some employees were selected to be part of the project team. There was a mandatory introduction called *Introduction to RamBase*, but additional meetings were not mandatory, and for some employees, the time for the additional sessions did not fit their schedule. Therefore, the amount of end-user involvement has been varying. Several employees stated that they had not been asked for input or been included in any decision making about the project. Thus, the decision to implement RamBase was experienced as one that came solely from the top management. However, KSMV allowed users to come with some input, but in doing so, required them to formulate a business case that had to be evaluated by management before changes could be made.

One of the most prominent challenges identified with end-user involvement was that, in general, few employees were interested in contributing to the project. Also, the lack of employees' early involvement resulted in less feedback and input. Interviewee 10 stated, *"No, I do not think there has been any input. Because we did not know what this was about, we just had a rough outline of it."* Several interviewees said that they would like to be involved earlier. Interviewee 10 stated that until the go-live many did not know what the change was about,

"Yes, I think so [earlier end-user involvement being something positive]. At least for some employees. There is a big difference between those who worked with Visma because we were looking forward to something else. Those who worked in the machines did not have anything to do with that. I do not think they knew what RamBase was until it went live."

5.6 Incentives

KSMV did not use any incentives to encourage employees to contribute to project success. However, top management communicated that those who opposed the change might have an early retirement. Such a threat may have served as an incentive for employees who want to keep their jobs. It was stated from top management that, "*The incentive in itself has to be that you have a job. This is a big incentive because we were almost bankrupt at one point."* However, there was a risk identified regarding the lack of incentives for the project team. The project manager was afraid that, due to the lack of incentives, the project team would get burnt out. This risk was more significant closer to go-live, as an all-time high workload forced the project team to work much overtime.

5.7 Management of expectations

KSMV has both unconsciously and consciously influenced employees' expectations towards RamBase throughout the project. As a result, the employees' expectations of RamBase varied. For some, it was unclear what was going on, what issues RamBase was solving, and how it solved these issues. For others, the expectations towards RamBase were based heavily on prior experiences with KSMV's changes, which often were poorly managed. Also, some developed expectations based on rumors and fragmented information they got hold of. Several employees expressed a wish for a clear statement of what the change meant.

Due to the high workload, many initiatives that were planned for were not executed. For instance, KSMV did not go through with what they called *The RamBase Game*. The game was planned as part of the training of users before go-live. Also, management communicated that there would be employees walking around in orange vests that would help with issues that may arise after go-live, which was referred to as *The RamBase Swat Team.* However, these initiatives were not executed, which led to expectations not being fulfilled, and some frustration among the employees, as interviewee 8 stated, *"If you have said it and given the expectations for it, already then when no one sees it, then people get frustrated."* The interviewee then continued, *"You have to do it. If not, a good thing can turn into something bad."* Several others also emphasized the importance of preparing employees for what is expected of them during the implementation, as stated by interviewee 8,

"The way it was done here is that it is up to each individual to learn RamBase. And someone catches up, right? And takes the initiative, asks questions, and deducts problems. For others, it does not make sense. There are many people with the expectation that someone is going to come and teach them. They do not ask any

questions. So, again, it is about preparation, that people are prepared for what is actually expected of them."

As prior change initiatives have been communicated similarly, followed by poor execution, this caused additional challenges. Interviewee 2 stated,

"Before we implemented RamBase, we had an extremely bad implementation of Visma. And people, of course, remember this. And then they have the perception that the next one will also be bad. And to get over that and say, 'okay it was a bad implementation last time, but this time we are going to do it right.' To get that information out is difficult."

In addition, KSMV experienced challenges due to a lack of competence in computer usage. As RamBase is a computer software, it was challenging to explain what it was, and how it helped the production, as employees struggled to grasp the technology. Also, the employees' knowledge of how KSMV operated, with regards to the value chain, was lacking. Thus, it became hard to grasp the benefit of being organized through an ERP system. Due to a lack of insight into the project progress, and lack of understanding of the reasons behind emerging problems, challenges that arose were interpreted differently and affected the expectations of employees.

5.8 Organizational resistance management

KSMV experienced some resistance towards the implementation of RamBase. This resistance was a result of various factors that KSMV made several measures to manage. A significant contributor to resistance was the combination of the organizational changes and a lack of communication about it. The lack of information led to some employees being unsure of how the change will affect their work. Interviewee 7 expressed some concerns regarding this, *"Some may think their workday will be changed in a way that makes you want to have it the way it was before. And because of that, your personal interests may be more important than the company's effectiveness."*

Due to KSMVs management of expectations, there were different conceptions of what the ERP implementation would mean for the individual employee. Different conceptions of the change made the work with resistance management more challenging as many employees had created their own expectations regarding the ERP implementation. This led to the risk of people resisting the change based on misconceptions, as described by interviewee 2,

"Many think that if we get good automation, then they will lose their job. That is completely wrong. If we get good automation, then they will get more time to work on other things, things they appreciate. To convey that information to individual employees, that these changes are in their interest in the long term, is extremely demanding."

Also, the management managed the resistance towards the change differently. Some saw the resistance among employees as a challenge that needed to be handled, while others did not, stating that employees would, sooner or later, realize that the ERP implementation was for everyone's best. One manager focused on communicating the reasons why RamBase was introduced in order to reduce resistance. The manager also claimed to have an overview of those resisting the change, stating, "*I have tried to communicate [why RamBase is implemented] myself, especially to those I know have been negative in general, not necessarily only to this, but those who, in general, are negative to everything.*" The ones that resisted the change were typically employees who had worked at KSMV for a long time. Furthermore, KSMV tried to manage resistance through an information meeting in which they informed employees of the change and consequences of resisting it. According to several interviewees, it was expressed from the top management that those who resist the change do not belong to the firm. Thus, fear was used as an instrument to manage the resistance. From what we experience, this had little effect on the degree of resistance towards the implementation. However, other means were also applied to manage the resistance. Some of the employees in management have been doing damage control, as described by interviewee 3,

> *"When there are expressed negative opinions [about the system], I go over and deal with it at once. Just try to talk positively about it [the system]and explain it if there is something we are saying that can give the wrong perception. Because they do not know what it is, or maybe they fear it. Then we can tell them how it is and how it is going to be."*

Another means used for managing the resistance was to empower employees. Due to organizational restructures, power was distributed among employees. As a result, employees received additional responsibilities, which led them to take responsibility for tasks, and through empowerment, became less resistant.

5.9 Planning

During the initiation of the project, the consultant company developed a rough plan based on their prior experience with similar implementations. It included activities describing how KSMV will start to use the system, when to give information to employees, training, and more. Although there were plans for many aspects of the implementation, they still left room for changes, and a lot of the planning was meant to be ad-hoc. The approach to planning was described by interviewee 3, "*We have an idea of how it will turn out, and then we will just adjust as we go, when we know what problems there are."* The planning was also described as very agile by interviewee 1, "*It is not very detailed plans. We kind of go through that function, do some tests, and then verifying, and then a new iteration. Very standard. Very agile.*" Due to the ad-hoc approach, the implementation had some twists and turns, such as the go-live date being delayed three times. However, this also had positive effects as it enabled the company to deal with emerging challenges and re-prioritize its resources when necessary. According to one interviewee from the management, postponing the go-live was positive for the company, "*We*

could have done it, but it was an unnecessary amount of risk. Just in the last three months now until February, the maturity has come a lot further, so it was the right decision, I think."

For KSMV, it was challenging to stick to the original plan as unforeseen events occurred. They postponed the go-live of RamBase twice because the project team decided that the company was not ready. Also, the company had to adapt the plan in order to prioritize resources where they were needed. This led to some discontent among employees who, for example, did not get the follow-up and training they were promised due to this.

Another challenging aspect of the planning was to decide the amount of resources needed. KSMVs plans did not include the sudden increase in workload they experienced. This created challenges as project plans were not aligned with the work required in daily operations. The company, therefore, experienced a lack of resources in the project.

5.10 Project champion

KSMV did not explicitly choose anyone to be a project champion. However, there have been employees who championed the change and, without knowing it, thus acted as a project champion. The project manager had some characteristics that were similar to a project champion. Interviewee 7 described the project manager like this:

> *"I think the project manager has been a powerhouse in this. [..] He has taken responsibility, not just as a leader and a consultant, but that he has taken ownership of it. I think this has been very important or crucial for getting to where we are now.*"

Due to the low distance between the top and the bottom of the organization, they did not identify anything that would indicate a need to select a project champion. However, they have chosen employees in different departments to have roles similar to that of a project champion. A representative from the consultant firm stated that, *"We have seen it contributing to success elsewhere, and we have observed that it has been done here, that you, for each department, pick someone that is aware and positive that can become some form of inter-missionary."* At KSMV, the usage of such champions has been done in order to ease the learning of RamBase. For instance, in one department, such a champion was paired with someone who initially was skeptical about the change. As a result, the employee that was skeptical instead became inspired, which according to interviewee 11, *"[..] resulted in that whenever [the skeptical employee] asked about anything, it was in a very positive way [..] because [the skeptical employee] had seen a colleague doing it yesterday, so it could not be because the system is not working."*

5.11 Project management

The ERP implementation was structured like a matrix project. In essence, this meant that all departments were involved, but it was not organized as an independent project. The matrix structure led to some challenges as the boundaries between the project and operations became

unclear. Most of the employees worked in the project in addition to daily operations in their line, with some few employees working solely on the project. Interviewee 11 stated that,

> *"[..] Since just before Christmas, there were at least two to three people that were free to work only with RamBase. The project manager should have been too, ever since the project started, but he has just received more and more tasks. That is the disadvantage of being [too] skilled."*

Because the project manager received additional responsibility, it was harder to identify issues, and they would linger in the background until they became severe enough to attract the necessary attention. The project manager described the additional responsibilities and consequences of it, like this,

> *"When I started the project, I was only responsible for RamBase. Half a year before go-live, I got the responsibility for warehouse, logistics, and assembly. One month before go-live, I also got responsibility for the whole production. [..] It means more management and coordinating than being down doing active things. So, there are some compromises."*

When asked about the challenges of the project, interviewee 13 stated that "*Turnover has grown, [and we are] going from 50 to 100 employees [..] It is complicated [..] If the project manager was able to focus just on just RamBase, it would be easier."* Thus, the overall load on the organization made it difficult to execute the implementation as intended. As a result, project management was mostly ad-hoc. Problems were resolved as they surfaced, and the problems making most noise was prioritized. In addition, the responsibilities of employees were unclear, and the culture also made it difficult to understand the dependencies across the departments caused by the new system. One employee described this issue, "*People here are very like 'this is my task' [that I am responsible for], I do not care about the tasks of others.*" Interviewee 9 also described the reasoning for this, which relates to the old culture, "*There is a culture in the company that if you did something wrong, you would be outed for it. Then it is easier not to take responsibility than trying to fix it.*" This culture left the issues to be identified by the project manager.

KSMV's managers applied different leader styles that differed in their understanding of the organizational culture. Therefore, the cultural aspects were often overlooked. Interviewee 2 stated,

> *"We have selected some people to do certain tasks, but they have not completed these [..] we trusted these people to do these tasks [..], but they have not completed these while stating that 'we have it under control.' Now we are live, and it is totally wrong. They have not understood the issue."*

While the issue described by interviewee 2 was not that manager's fault, a project manager with knowledge about the culture would likely have followed it up more closely to ensure that the

respective employees understood the issue. In addition to this, the different leaders differed in how forgiving they were to employees making mistakes, and how they reacted to employees having issues in the use of, or in understanding the need for, RamBase.

5.12 Project teams

Since the initiation of the project, there have been several employees involved in the project. The employees chosen for the project teams were influenced by the consultant firm, which stated that, "*We help to describe what kind of people that must be selected[for the project team], and what areas that must be represented, but not on the personal level."* The core project team consisted of three employees from KSMV, the project manager, and two project assistants, and two consultants from the consulting firm. New business processes have been confirmed through temporary project teams where managers and other operational employees were included in determining how to design, test, and implement the new processes. The structure of the temporary project teams was adapted as needed throughout the project. The project teams were constructed for each department. In these teams, the project manager aimed to gain insight into the departmental issues in order to resolve them. Hence, these would often be set up ad-hoc. The temporary teams would often consist of the employees the project manager would later assign as process owners. One of these employees described their role as, "*I am what you would call a superuser. That means that I will take the lead on the implementation of the module I am responsible for [..] and that I also will train my own organization [on this module]."* Another employee described it like this, *"My role in the implementation of RamBase is basically to meet the needs of my department [..] whatever that relates to procurement in RamBase."*

Due to the high workload, it was difficult for employees in the project team to put sufficient effort into the project, with the project manager stating that, *"The whole team has been eaten up by the high workload."* The project manager also expressed concerns about how much overtime the project team worked, *"It is getting serious in the organization now because people are down to the rim [..] It is not necessarily just RamBase, but it is the context."* In addition to the tasks assigned from both line and the project manager, the context made it difficult for project members to prioritize which tasks to give focus. Interviewee 11 stated,*"[..] One cannot simply divide the week into two; that one should work 50% in the project, and 50% in the line because both are heavily dependent on transactions."* As a result, it became more challenging to handle both line and project-related tasks as a project member.

5.13 Risk management

KSMV combined periodical risk assessment with ad-hoc risk management. Early on, the project manager developed a risk matrix with descriptions, probability and impact, and descriptions of how to manage the most important risks. The project manager stated,

> *"I was the one to write them down, but I have verified them with my people [..] We planned to go live in November, [..]so then I updated the risk matrix, and I also did an*

assessment in the middle of December where I checked the top 10 - if we had done something with them."

The other project members were not involved in the day-to-day handling of the risks. Thus, the overview of the risks was only kept by the project manager. As a result, the prioritization of the risks would often not correlate to the prioritization the risk matrix suggests. However, the project manager stated that *"As long as I know that the managers tell me if there are any problems, I do not think about it."* Since the risk management, therefore, was ad-hoc, the project manager was only able to address risks that he knew.

Identifying risks with an ad-hoc approach proved to be challenging. For instance, interviewee 1 stated, "*They [department responsible quality assurance] were not adequately included in the beginning [..] They had no leader to follow up employees daily, so there was a growing ball of problems inside the system that we saw just last week.*" Thus, the lack of leaders at KSMV made the ad-hoc risk management difficult.

Time and resource constraints forced KSMV to accept risks that they initially planned to manage. For instance, one risk they addressed was not being able to change the culture. This risk was planned to be mitigated with additional training and dialogue. However, resource constraints prevented it. Overall, with the ad-hoc risk management approach, the risks had often occurred before they were managed, and KSMV had to handle the incurred risks rather than to mitigate or avoid them. This proved to be especially challenging closer to go-live because the project manager received additional responsibilities in addition to the project manager role. Thus, the ability to sense and react to the risks drowned in everything else.

5.14 Top management support

For several years KSMV considered implementing RamBase. However, they experienced that the steering group lacked insight into the need for such an ERP system. Interviewee 13 stated that,

"*[..] to think about production at that level is rare because you just care about numbers and economy. And in that case, Visma Business is a really good product. Visma is good for economy, but not as good for production.*"

Ever since KSMV was acquired by Otterlei Group, the support from the top management and steering group has been present. The top management support can be summarized by the owner's mantra, *"If you take care of the production, the production will take care of the numbers."* The steering group has, on several occasions, given their support to the implementation. Interviewee 7 stated that "*Our CEO is very positive, 'this will be fantastic'*." The CEO was involved when the project started and got the steering group and the owners on board. After the contract was signed, the CEO delegated the implementation responsibility to the project manager. The CEO has, throughout the implementation, facilitated the change by helping to solve problems and giving support when needed. For instance, the CEO supported the project manager when a delay in the implementation process was needed, and when

additional resources were needed. As a result, the go-live was postponed, and additional resources were acquired. The project manager stated,

> *"I have been allowed to go for it. There was some trouble in the fall when we had to postpone, but I was able to argue for why we had to do it. [..] the CEO and the owner has also been a driving force. Every time [the owner] has been here, [the owner] asked 'RamBase? When is it coming?' [the owner] wants it to be implemented."*

Also, interviewee 3 stated, "*It is the CEO that is the main driving force for RamBase, and that is probably the best starting point one can have[..] and then you get funds.*" However, this perception was not shared by everyone, and one interviewee stated that, "*It has not been challenging. I am not sure if it has been good or not because the top management has distanced itself a lot and instead delegated the responsibility to the project manager.*" Also, interviewee 8 stated, "*The top management support has been absent. The only thing that person [the CEO] has done is to sign the contract.*" Thus, there are different opinions about the degree of top management support. Interviewee 8 stated, "*We have not used the possibilities we have to build an understanding around RamBase and make it into something positive. [..] It is because [the CEO] is not present.*" Overall, due to the lack of visibility and engagement from top management, the organizational implementation proved to be difficult. Also, the different leadership styles among top managers made it challenging to send a unified message.

5.15 Training and education

One of the main reasons why the implementation of Visma failed was a lack of focus on training and education. Therefore, KSMV, during the implementation of RamBase, made a multitude of measures to ensure better training and education. KSMV started educating the employees two months before the go-live with brief descriptions, which interviewee 1 summarizes,

> *"[..], but I have tried to delay the training and information as long as possible. Everyone knows that RamBase is coming and they have known that ever since we signed the contract. It is only the last month that I have begun to put some pictures on the screens, and we had an information meeting for all employees right before Christmas, roughly one and a half month before go-live, where we said, now it is coming, these are the conditions, this is how it looks, and merry Christmas - more training will come!"*

Furthermore, KSMV planned to develop a game that simulated the use of RamBase. However, interviewee 2 stated that "*We had developed a training program and we wanted to execute that plan, but due to the situation [..] we do not have enough people to execute it.*" Thus, they instead opted for a combination of information meetings and on-the-job-training. First, all employees were invited to a mandatory introduction course, *Introduction to RamBase*, in which 95% of the employees went through. Next, all employees at the management level were at two or more sessions that consisted of a walkthrough of the related RamBase modules and adjoining

features. In addition, 80% of the operators (operating the machinery) went through a custom session, *RamBase for Operators*.

However, there was almost no practical training included, as interviewee 1 stated, *"[..] we have not had any practical training with clicking in the system and such. Some departments have had it, procurement and project have, but the majority of the operators have not been in RamBase and clicked themselves*." Overall, employees requested more practical training tailored towards each individual. Several of our interviewees stated they wanted to run through a project from A to Z with every step.

When asked how well on-the-job training went, interviewee 1 said, "*It has been varying. [..] There was so much to do at once that we did not manage to do it structured; it became unstructured.*" The challenge identified with this approach was that the employees received a varying level of training, and it was based on the individual's ability to learn for themselves. Also, since the training was done on-the-job in an ad-hoc manner, there had to be a problem present before the employee would get any training on how to solve it. Thus, the training would focus on solving the issue rather than helping the employees learn how to solve it themselves. In addition, the training of employees was done by representatives from the project team. These employees had experience in using RamBase for a long time throughout the project and were very familiar with how it worked. The training was, however, not tailored to an appropriate level and did not take prior knowledge of the employees into account. This led to a gap in how the training was received, where employees with prior system knowledge would more easily understand it, and others would feel that it was overwhelming and unclear. Interviewee 13 stated that "*Some people are stating that they have received bad training and that it is too hard and cumbersome.*" This was neglected by the top management, who stated that the system was not hard to learn.

5.16 Vision for the change

There was no clear vision for the change formulated and communicated. However, when interviewing the employees, we identified that they all had slightly different perceptions of some form of a vision. Their vision was altered to fit better with how RamBase solved their personal work-related issues, rather than to the organization as a whole. Furthermore, several of our interviewees requested some form of a vision. When asked, interviewee 7 stated, "*Yes, like, why are we doing this? Although, it might be just me that has been sitting outside, wondering, but I feel that it would send out clear positive signals.*" Also, interviewee 9 stated, "*[..] and even more focus on what the benefits of the system are, and what is expected of the individuals.*" However, when asked about what the communicated vision was, the CEO stated,

> *"It is to get better control of our organization. At least that is what I have communicated all along, to get control. [..] in Visma, we eventually managed to get monthly results, but now we are at the point where we can be updated all the time. And that control, in a way, is very important."*

Also, interviewee 3 stated, "*We are not doing this for fun, we are doing it because it will help us. [..]it means that most of us will get a much better everyday life.*" The different answers regarding the vision indicate that the understanding of how RamBase is supposed to help KSMV differ.

5.17 Key results

In this chapter, we present the key results. First, we present a summary of the main challenges and its reasons for being challenging regarding each of the CSF, as illustrated in table 5. Next, we present some further insight into these reasons.

CSF	Challenge	Reason(s) for challenge
BPR	Adapting to new processes	Cultural inheritance of not accepting change
	Avoiding system usage	Cultural inheritance of accepting workarounds, lack of computer knowledge
Commitment to change	Discover resistance	Employees may not be explicit about resistance
	Ensure continual commitment	Requires continual efforts
	Creating commitment	Lack of resources, Cultural distance between operational and management
Communication	Informing all employees	Shift schedule, culture, lack of access to e-mail, lack of attendance
	Providing sufficient information	Meet individual information needs, lack of insight into employee's prior knowledge, hard to identify the need for information, late involvement of employees
Company support	Get employees to understand the need for an ERP system	Operational employees did not use computers, lack of knowledge about ERP systems and the organizational processes
	Ensure continual support	Lack of end-user involvement, history of failed implementations, emerging issues
End-user involvement	Involving all end-users	Schedules, lack of attendance, lack of end-user engagement
	Getting feedback and input	Lack of early involvement

Management of expectations	Hard to convince employees that this implementation will be successful	Bad implementation of prior ERP system
	Realistic expectations of system usage	Many employees did not use any systems, thus hard to know what to expect of the new ERP system
	Fulfill given expectations	Changes in the plan due to the ad-hoc approach
	Employees expectations to the system	Rumors and resistance
	Management's expectations to the employees	Rumors and resistance
Organizational resistance management	Detecting resistance	Culture of employees not communicating their problems
	Fighting resistance	Misconceptions due to lack of involvement
Planning	Sticking to the original plan	Ad-hoc approach, all-time high
	Planning resources	All-time high, emerging problems
Project management	Prioritizing resources	Unclear boundaries between project and operations, all-time high, emerging problems
	Addressing problems	Ad-hoc approach cause KSMV to be reactive instead of proactive
	Keeping a holistic view upon the implementation	Project managers additional responsibilities, all-time high
Project team	Project members ability to handle project and line related tasks	Project team got drowned in tasks
	Worn-out employees	Project-related task came in addition to their line related tasks, excessive use of overtime
Risk management	Mitigate and avoid risks	Ad-hoc approach, lack of ability to identify risks, all-time high, loss of holistic view

	Utilize the risk matrix	Lack of familiarization of the risk matrix among the project team, ad-hoc prioritization of risks
	Identify risks	Required employees to report issues, workload on project manager
Top management support	Steering groups ability to understand the need for an ERP system	Lack of familiarization with the day-to-day operations, their focus on economy instead of production
	Visible top management support	Lack of top management engagement among employees, culture of leadership
	Sending a unified message	Different leader styles among top managers, lack of consideration of cultural heritage
Training and education	Give adequate training	Unstructured approach, training not personalized, late involvement, on-the-job training focused on solving issues instead of learning how to solve them, neglected prior knowledge
Vision for change	Identify the need for a unified vision	Different perceptions of benefits among top management, focus on personal instead of organizational benefits, lack of end-user involvement

Table 5 - Summary of key results.

We synthesized the reasons behind these 33 challenges presented in table 5 into eight key reasons. These eight key reasons represent the main reasons that made change management initiatives challenging at KSMV.

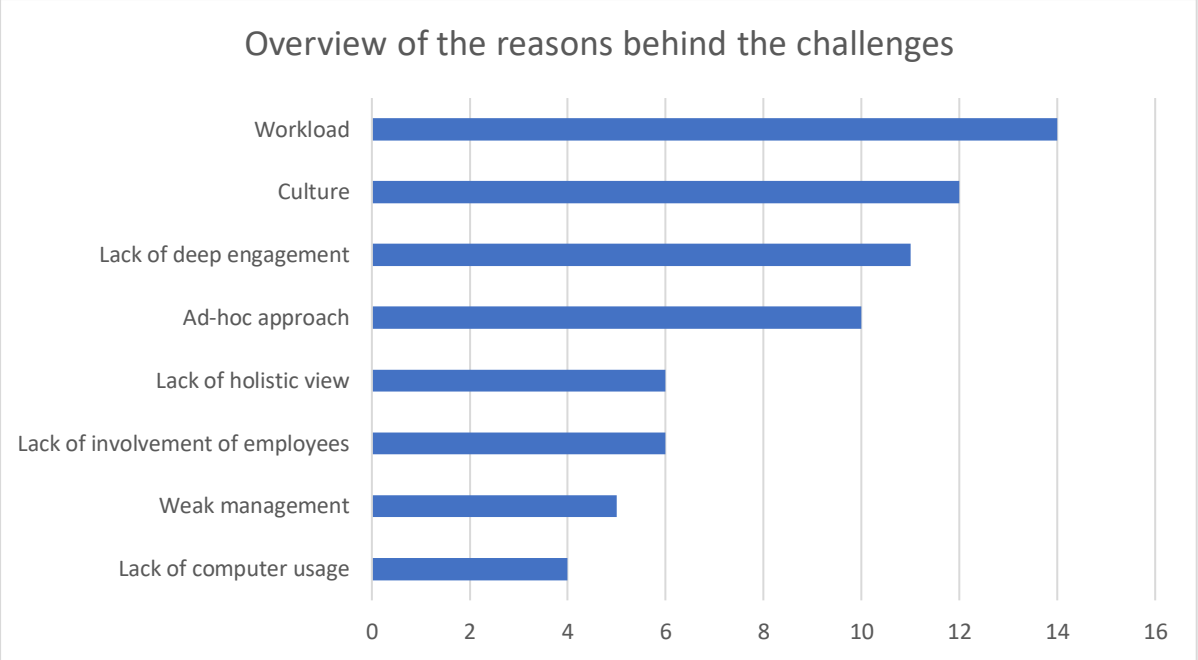

Figure 3 - Overview of the reasons behind the challenges.

As figure 3 illustrates, the most prominent reasons that made change management challenging is workload, culture, lack of deep engagement, and an ad-hoc approach. These eight reasons comprise both contextual prerequisites present at KSMV, but also involve how the change management was executed throughout the implementation process. In the following, we discuss the reasons why change management is challenging to tackle during an ERP implementation project.

6. Discussion

In this chapter, we discuss our empirical findings in light of previous literature and our research questions. In chapter 1 we presented our research questions which form the basis of the discussion, and these are,

> RQ1: How do SMEs manage change during ERP implementations?
> RQ2: Why is change management challenging to tackle during ERP implementations in SMEs?

Following, we discuss the CSFs that we perceived as important to consider in this ERP implementation. The importance of the CSFs is based on the severity and number of challenges related to it. Therefore, the ones that are most challenging to handle become more important due to the higher risk of failure. Next, we discuss CSFs that were less important to consider, followed by a discussion of the role risk management. Finally, we discuss each of the eight key reasons that made change management challenging.

6.1 Important CSFs identified in the study

6.1.1 Business process reengineering

Our literature study shows that BPR is especially important in SMEs as it carries a much higher risk for them than large enterprises, making it more critical for SMEs to adjust to the system (Shaul & Tauber, 2012). It is also important to adapt the business processes and to make the necessary structural changes to take advantage of the system's functionality and for the companies processes to fit with the usage of the system (Žabjek et al., 2009). This is consistent with what we observed at KSMV. Some of the biggest challenges we identified are related to BPR, and concerns old processes not fitting with the new system, and that users were falling back into these old processes. Also, KSMV has restructured departments to better fit the system's usage in order to take advantage of its functionalities. We also observed that BPR was the one factor that opposed the current culture the most, which contributed to a lot of the resistance towards the change. This is because it led to fundamental changes in the structure of the company, responsibilities, and tasks among the employees. While many employees realized that this change was needed due to the company's current situation, many did not want such changes in their work-life, causing them to oppose it. Therefore, in addition to being a challenging CSF to handle due to the comprehensive changes that are required, it also affected many other CSFs such as resistance management, training, communication, project management, and top management support.

6.1.2 Training and education

There is a consensus that training and education are very important in ERP implementations (see e.g., Al-fawaz et al., 2010; Park, 2018; Reitsma & Hilletofth, 2018; Somers & Nelson, 2004). This is because it helps ensure user acceptance (Somers & Nelson, 2004), and helps the company exploit its functionality (Shaul & Tauber, 2012). It is common for companies to underestimate the amount of training that is necessary (Umble et al., 2003). We found this to

be very accurate, as KSMV has underestimated the amount of training the users needed. This led to several challenges, such as some users not accepting the system, and users not knowing how to use it. This CSF was also affected by the fact that they were not aware of the employees' knowledge level, which made it hard for them to tailor the training to their level. We, therefore, see that training and education could benefit from input and feedback from users during end-user involvement, making it less challenging to adjust the training to employees' level. Doing this could decrease the challenges of training and education as the biggest challenge to respond to this CSF was to provide adequate training.

6.1.3 Top management support and company support

Top management support is instrumental in achieving success in ERP implementations (Dezdar & Ainin, 2011). It is also important in every step of such an implementation (Žabjek et al., 2009). In this case, we have observed that top management support has played a vital role in the implementation as all the actions have been backed by the top management, giving the project the resources and time it has needed. However, the support has not been evident for employees at the operational level, which has affected the company support to a great extent. While it is important to have the support of top management, it can be of equal importance to have the support of the rest of the company (Schniederjans & Yadav, 2013), and for the implementation to be successful, all parts of the company must support it (Razmi et al., 2009). This has proven to be accurate with our analysis, and many of the challenges KSMV has faced are related to parts of the organization not supporting the change. Furthermore, we have seen that lack of visible top management support has led to less support from the company, meaning that the top management support had a significant influence on the support it received from the rest of the company. It is also of great importance that the leadership is supported by the employees (Schniederjans & Yadav, 2013). This has caused some challenges at KSMV as some employees did not support the leadership.

6.1.4 Communication

Communication in an ERP implementation is important during all stages, both before, after, and during the project (Van-Hau & Kuzic, 2010). It should also be a top priority in change management (Malhotra & Temponi, 2010). The communication at KSMV has significantly been affected by *the attention box* approach identified in this study. While employees were informed about the change at a relatively early point in the project, most of the information was held back until just two months before the go-live date. This created many issues for the company, as many employees claimed that they did not know what the project was about or their role in it. This went on to create challenges in getting company support and led to some resistance among employees, increasing the need for resistance management. The communication during the implementation has been partly planned and partly ad-hoc. KSMV planned some information meetings while the rest were withheld until a need for more information occurred. This is not unusual for SMEs as they, in many cases, utilize an ad-hoc communication strategy that is enabled by the typically close and informal communication (Malhotra & Temponi, 2010). While this enabled them to adapt the communication strategy, it also created some challenges as employees wanted much more information, but often did not receive it, as management prioritized the resources elsewhere. KSMV could, therefore, have

benefitted from planning more information meetings to ensure that employees received an adequate level of information in time. The importance of communication in this ERP implementation has been very evident as we observed several challenges related to it, and as a result of the communication that was utilized. It also profoundly affected other factors, such as company support and resistance management.

6.2 Less important CSFs in this study

6.2.1 Project champion

The project champion is typically an essential part of ERP implementations as they advocate the change, tries to keep everyone motivated, and, along with the top manager, help lead the implementation (Razmi et al., 2009; Schniederjans & Yadav, 2013). However, KSMV has not appointed anyone the role of a project champion. While the literature emphasizes the importance of such a role, it is typically mentioned in a large enterprise context. Since SMEs typically rely on more close and informal communication (Malhotra & Temponi, 2010) as opposed to large enterprises, the need for a project champion may be smaller because of the smaller distances between management and employees. In KSMV, we have seen that the project manager has characteristics of a project champion. Also, several other employees and managers have, at times, acted as project champions when the need for it arose. This substantiates the statement that project champions are not as important in ERP implementations in SMEs, as the close communication allows for several employees to take on such a role when needed. This also fits well with the typical ad-hoc approach found in SMEs (Malhotra & Temponi, 2010).

6.2.2 Incentives

Incentives are typically used in projects to motivate the employees to contribute and accept the change (Park, 2018). The use of incentives can help employees accept the change and adopting new systems (Van-Hau & Kuzic, 2010). As KSMV has met some resistance due to employees not accepting the change, incentives could have helped them along the way. However, top management did not see the need to use incentives as this change was crucial for their survival. Top management expressed that there was no need for incentives as the ERP implementation was something they did for the company to survive. Our observations prove that many of the employees were aware of this situation, and while it is not an incentive, it still helped users accept the change and get on board. However, as mentioned, KSMV did meet some resistance from users not accepting the change, but we deem this resistance to be of cultural reasons and not the lack of incentives. Thus, we argue that the lack of incentives did not impact the implementation. In addition, the company's economic situation makes it hard for them to offer any incentives. This is also typical for SMEs, as many have economic constraints (Malhotra & Temponi, 2010). As most employees realized why this change came, there was not a significant need for incentives to get them on board.

6.2.3 Vision for the change

A vision for the change is important before an ERP implementation (Kim et al., 2016), and during the different stages (Somers & Nelson, 2004). While KSMV seems to have had a certain

vision for change before the project, this was not communicated to employees during the implementation, and many employees had different opinions on the effects of the system. However, as management's vision for the change has been aligned, this has not affected the progress much. It has, however, contributed to some resistance as some employees stated they did not know what the change means for them. Although KSMV has not had an overall vision for the change, they have had goals and objectives underway, to help guide them. Therefore, as this CSF has received little attention at KSMV, and we have not observed any severe consequences of this in terms of challenges observed, we deem it to be of less significance in this implementation.

6.3 The importance of risk management

As the conducted risk assessment governed mitigating and avoiding risks related to other CSFs, we see that additional risk management efforts would provide significant benefits. The literature argues that risk management is especially important for SMEs because the investment is bigger and the pitfalls are greater compared to large enterprises (Malhotra & Temponi, 2010), and also because few SMEs have the resources to address all CSFs in ERP implementations (Shaul & Tauber, 2012). Due to, e.g., workload and managers' additional responsibility, risk management received less attention than planned. The lack of attention made other CSFs more challenging to handle. For example, the mitigation plan of the risk *failing to execute the cultural change* was not executed, thus gaining company support became more challenging.

Furthermore, due to limited resources in an SME context, SMEs must make careful compromises upon assessed risks (Shaul & Tauber, 2012). The compromises applied at KSMV were ad-hoc, often stressed decisions, not based on the conducted risk assessments. Thus, decisions would focus on solving short-term issues rather than the long term in order to manage all ongoing activities temporarily. Also, much of the risks addressed were related to the technical or functional side of things. In contrast, the highest risks for SMEs in ERP implementation are related to people-related issues (Malhotra & Temponi, 2010). We believe that due to lack of engagement with the users, much of the people-related issues were not as easy to identify. As an example, the risk of *not giving appropriate training* was identified, whereas the risk of *not giving personalized training* was not. Overall, with the risk management approach, challenges related to other CSFs became further challenging because their related risks were not adequately managed.

6.4 Reasons for ERP implementation challenges

6.4.1 Culture

The culture was a reason for why many of the challenges identified at KSMV were challenging. In general, culture may be either a facilitator or a major impediment to change (Razmi et al., 2009). The culture present at KSMV proved to be more of an impediment than a facilitator for change management. At KSMV, the incorporated culture involves accepting workarounds, resisting change, and working in silos. There have been few changes over the last decade, and the company's business processes have mostly remained the same. Therefore, an ERP implementation, in addition to organizational growth, challenged the incorporated culture. Previous research demonstrates that a culture where employees share common values and goals

and are receptive to change is important for successful change management (Fui-Hoon Nah et al., 2001; Kim et al., 2016).

Furthermore, corporate culture should share common goals over individual pursuits and emphasize the value of trust between employees and managers (Razmi et al., 2009). Such a culture for shared goals and trust lacked at KSMV. Instead, it was often talked about *us* and *them*, due to a history of weak management and hierarchical distance between the management and operational levels. As the implementation was a management initiative, which mostly included employees at the management level, the operational employees felt that the management forced the change upon them. This was further challenging because of the *us* and *them*-feeling, which affected the ability to share values and goals. We, therefore, argue that the cultural inheritance was neglected and not satisfactorily taken into account throughout the implementation. Overall, we saw that this affected KSMV's ability to create commitment and company support, which is vital for ERP implementation success (Schniederjans & Yadav, 2013). With a lack of commitment and support comes some level of organizational resistance, which led to some challenges in conducting training sessions. In addition, a certain amount of resistance to change is expected with ERP system implementations, the project manager, or a project champion, should accept and deal with it rather than to go into denial (Malhotra & Temponi, 2010). The top management both accepted and denied the culture through different approaches deployed by managers. Thus, there was no unified message communicated, which we argue made it more challenging to prepare the organization for the change. We also argue taking organizational culture taken into account, would facilitate for the change, instead of being a hindrance.

6.4.2 Lack of deep engagement

In this ERP implementation, lack of deep engagement was the reason behind several of the challenges observed. These challenges are again related to specific CSFs that companies need to be aware of during an ERP implementation. The ones that were most affected by it were communication, training and education, organizational resistance management, and end-user involvement.

Management's ability to obtain feedback and input from employees through interaction is an important influence for success in ERP implementations (Snider et al., 2009). Further, it is important to include those who might or will be an end-user of the system because they might have valuable input for management to consider (Hasheela-Mufeti & Smolander, 2017). Many challenges were created due to KSMV's lack of effort to understand and interact with employees to obtain this kind of input and feedback. First, it affected communication by making it challenging to know how much information is sufficient as they did not know anything about employees' varying levels of knowledge about ERP systems or their need for information. Second, it affected training and education by making it difficult for them to know how much training and education the employees would need, for the same reasons, that they did not know enough about their employees' prior knowledge or needs. Third, it affected resistance management, as parts of the resistance towards the implementation was not noticed or confronted due to lack of interaction with employees. Fourth, as KSMV did not put much

effort in the area, the amount of feedback and input was limited, thus affecting end-user involvement. In addition, not all end-users of the system were included, with some interviewees claiming they knew nothing about the implementation and how it would affect them. Lastly, we believe that risk management was, to some degree, affected by lack of deep engagement as the highest risks in ERP implementations for SMEs are people-related issues (Malhotra & Temponi, 2010). We argue that lack of engagement with the users, made many of the people-related issues hard to identify and, therefore, never made it to the risk matrix.

While the lack of deep engagement was the reason for many challenges, it is also likely that it has been affected by the workload the company experienced during the implementation period. This has forced KSMV to do many trade-offs, and deep engagement may have suffered because of this. Although this resulted in factors such as communication receiving less attention and leaving employees wanting more information, it is more important to involve employees when there is a need for them to participate in project activities, rather than to inform them about the progress and tasks that do not concern them directly (Snider et al., 2009). Thus, even though many employees were unhappy with the communication, it might not have had particularly negative consequences. However, we observed that employees feeling that they did not get enough information, led to more resistance, and ultimately made it harder to get full company support.

6.4.3 Ad-hoc approach

As described, KSMV performed an ad-hoc ERP implementation approach for many of the project activities, which caused a series of interconnected challenges. However, this approach is not unusual for SMEs as the small distances between employees and leadership in the company typically allow for more informal and close communication and an ad-hoc approach (Malhotra & Temponi, 2010). The main CSFs this reason affected were project management, planning, management of expectations, and risk management. For risk management, it was difficult to mitigate and avoid risks as the ad-hoc approach made KSMV reactive instead of proactive. As a result, it became difficult for project management to address problems as they often had to tackle the consequences of it, and not the problem itself. For planning, it was difficult for them to stick to the original plan as different problems emerged and created the need to deviate from the plan, which the ad-hoc approach facilitated. This had several positive effects as the approach put them in a position to tackle emerging problems. However, as they were usually reactive instead of proactive, the consequences were managed instead of the problem itself, which lead to several instances of the same problem. The importance of being proactive by planning far ahead is emphasized in previous research (Hasheela-Mufeti & Smolander, 2017). While KSMV started planning far ahead at an early point, the ad-hoc planning quickly took control, and the initial plan was not followed.

The ad-hoc approach made it difficult to prioritize the company's resources for the project as the prioritization decisions were often made on the spot based on the relative importance of emerging problems. As a result, the project team often had to prioritize tasks related to their day-to-day job. Furthermore, this led to difficulties in managing the expectations of employees as they could not carry out the close follow-up of the end-users as was initially promised. It is

argued that giving employees expectations that are not fulfilled or that are unrealistic can create unforeseen consequences (Shaul & Tauber, 2012). In this case, this resulted in an increased resistance among the employees, increasing the challenges of the resistance management CSF, and a strengthening of the gap between management and operational departments.

6.4.4 High workload during the ERP project

During the implementation period, KSMV experienced an all-time high workload due to organizational growth. As the ERP implementation was structured like a matrix project, it became difficult for employees to prioritize whether they should work on daily operations or the project-related tasks. Also, due to the all-time high workload, the daily operations stole project resources. This created several challenges for KSMV, such as ensuring continued commitment to the project, giving adequate training, identifying risks, keeping a holistic view on the implementation, and worn out employees. Through these challenges, this reason affected several CSFs such as company support, training and education, risk management, project management, and project teams.

In order to be successful in ERP implementations, companies need continual support from leadership (Dezdar & Ainin, 2011). Assuring continual commitment from leadership became challenging in KSMV due to their tasks being split between project and daily operations, in addition to the increased workload. Due to customer demands, managers had to direct more focus on daily operations. This ultimately affected the project management and resulted in the loss of a holistic project view as the project manager, who was the only one with the holistic view, got so much additional responsibility that he could not keep track of everything. Furthermore, the workload affected KSMV's risk management. Much like with project management, the management of risks was mainly the project manager's responsibility. As the project manager progressively received additional responsibility, in addition to his role as the project manager, risk management consequently received less focus. Therefore, the loss of attention to risk management was due to limited resources. However, as SMEs typically have limited resources, it makes the risk assessment more important as SMEs must make compromises upon carefully assessed risks (Shaul & Tauber, 2012), which is the opposite of what happened at KSMV.

The need to prioritize resources also caused challenges for training and education. Companies often underestimate the amount of training that is necessary (Umble et al., 2003), which KSMV did with their previous ERP implementation. Therefore, they decided to give training and education additional attention this time. However, parts of the training were cut out due to the workload, and the practical and actual usage of RamBase was not included in the training that employees received. This caused the training to become abstract, and individuals that were less confident with computers were not adequately trained. In addition, the training sessions were not necessarily tailored towards the individuals. Instead, the same training was given to all employees, with some minor differences between the different departments.

Training is crucial when it comes to fully exploiting the functionality of a system (Shaul & Tauber, 2012). As KSMV did not focus properly on training, they risk that they will not be able

to utilize the system properly. However, due to the loss of holistic view and loss of ability to act proactively upon risks, these challenges were not handled in risk management.

6.4.5 Lack of holistic project view

From the start of the project, the only one with a holistic project view was the project manager. As described earlier, the workload resulted in the loss of a holistic view. This created several challenges during the ERP implementation relating to CSFs such as risk management, vision for the change, company support, and top management support.

First, this reason created different perceptions of what the change would mean to employees and the company. Therefore, the vision shifted towards personal instead of organizational benefits. Vision for change is important in ERP implementations because it gives direction to the project and drives the change forward (Fui-Hoon Nah et al., 2001; Kim et al., 2016; Somers & Nelson, 2004). The lack of such a vision, therefore, made it challenging to give direction and drive the change forward as different people pulled it in different directions.

The lack of a holistic project view, in combination with no vision for the change, made it difficult for some of the steering group members to understand the need for an ERP system. This led to some resistance in the steering group. However, the strong top management support from the CEO has helped to push through the change. Furthermore, for the same reason as to why there is resistance in the steering group, the lack of vision for change has led to some employees having trouble to understand the need for an ERP system. However, our analysis shows that many employees realized that KSMV needed to make a change, which has made this challenge manageable.

6.4.6 Lack of involvement of employees

Lack of involvement of employees in the project has led to several challenges. These challenges are ensuring continual support, getting feedback and input, giving adequate training, involving all end-users, and providing sufficient information. All in all, this reason affected five different CSFs, which are company support, end-user involvement, training and education, communication, and BPR.

KSMV’s plan included a late involvement of employees due to the attention box approach. Still, several employees did not feel they were involved at all. This lack of involvement made it hard for employees to give feedback and input on the project, as many did not know whom to give it to, or if they could even give feedback. KSMV may have missed out on valuable input as end-users often have valuable insights and feedback (Hasheela-Mufeti & Smolander, 2017). This went on to increase the challenge of giving adequate training as management was not aware of the different employees' knowledge level or their need for training. The challenge of providing a sufficient amount of information was also made increasingly challenging for the same reason.

ERP users should be heavily involved in reengineering due to their importance for success in such projects (Schniederjans & Yadav, 2013). It is also recommended that companies engage

in collaboration across departments for reengineering processes (Kwak et al., 2012). This has not been the case in KSMV as most users were involved late in the project, and they did not have any input on the reengineering of processes. If KSMV had done this, it could have helped ease the challenge of adapting to new processes as employees would have ownership of it. The late involvement of employees may, therefore, have increased the challenges of BPR.

6.4.7 Weak management

The management during the ERP implementation has created some challenges for the ERP implementation. It mainly affected CSFs such as top management support, end-user involvement, communication, and project management. Lack of understanding of project management fundamentals may cause negative consequences for the company (Ehie & Madsen, 2005; Hustad & Olsen, 2014). These are fundamentals such as focusing on objectives, tracking of project planning, and resources (Reitsma & Hilletoft, 2018). One of the main contributors to these challenges is the different leadership styles among the managers. This has made it challenging to send a unified message to employees as often different messages were communicated from different managers. Previous research suggests that the success of an ERP implementation is dependent upon the commitment from leadership (Dezdar & Ainin, 2011). Also, leadership must be supported by the rest of the company (Schniederjans & Yadav, 2013). While KSMV has the support it needs from top management, some employees have proven to show some resistance towards the leadership. Also, while the top management support has been present, many employees claimed it was not there at all. This shows that there is a disconnect between what has happened and what employees experienced. Making the top management support visible has been challenging for KSMV. As considerable efforts were not made to ensure visible top management support, it has made ensuring the support of the rest of the company more challenging.

Weak management also affected communication. For instance, the information meetings did not have mandatory attendance except for the first introduction. This increased the challenge of informing them about the change as some would not show up, causing frustration among managers. The weak management also made it challenging to prioritize the resources properly as employees often responded to both line managers and project managers. Because there were no clear guidelines for how much work should be done in operations and the project, the time employees were supposed to spend in project and operations often did not add up.

6.4.8 Lack of competence in computer usage

Historically KSMV has not used computers as part of the day-to-day operations except for on management level. This has manifested itself as a part of the culture at KSMV and created several challenges when implementing the ERP system. These are challenges such as employees avoiding system usage, getting them to understand the need to use computers, informing all employees, and giving them realistic expectations of computer usage.

This reason has made it challenging for employees to adapt to the new processes that are a part of the ERP system. Their lack of experience with computers causes them to try to avoid using it, and therefore they also avoid the new processes. This has made the work with BPR very

challenging, as failing to adapt processes to the ERP system can cause them to not being able to utilize the potential of the ERP system (Žabjek et al., 2009). Furthermore, as employees did not use computers daily, many did not see the need to use it now either, making it challenging to gain full company support. The lack of experience with computer usage, in combination with varying management of expectations, made it challenging to give employees realistic expectations of the system usage.

The lack of computer usage also created some challenges for the communication as many employees did not have access to computers, causing several employees to miss out on information that was sent by email.

7. Conclusion and implications

In this section, we present our conclusion and the implications for research and practice from this study. Finally, we present the limitations of our study and suggestions for further research.

7.1 Conclusion

In this thesis, we have revealed 33 challenges of change management in ERP implementations. We also uncovered several reasons for these challenges that we condensed into eight key reasons. Through our observations of the challenges, we found some CSFs to be more important than others due to the severity and number of challenges related to them. These were BPR, communication, top management support, company support, and training and education. We also found that BPR opposed the established culture at KSMV, due to the fundamental changes it led to in the organizational structure, tasks, and responsibilities. BPR, therefore, became increasingly challenging as the changes were comprehensive, and the culture led to a lot of resistance towards it.

Furthermore, we found the culture to be the reason for many of the challenges that KSMV faced, as there was a culture for opposing change and avoid responsibility. However, we also found the workload to be the reason for the most challenges as it forced KSMV to prioritize resources, which meant that essential parts of the implementation did not get the attention it needed. This led to challenges in giving adequate training, providing adequate information, handling risks, and more. It also contributed to a lot of the resistance against the change through creating challenges in all these factors. Lack of deep engagement also created some challenges as the lack of input and feedback from employees left managers unaware of employees' knowledge and needs.

Through our observations of challenges, we found that the challenges are interconnected and that one challenge often leads to, or increase, other challenges for responding to different CSFs, if they are not appropriately handled. This further shows the importance of risk management, as it provides the opportunity to be proactive and stop challenges from creating more challenges. We found risk management to be essential but underestimated in this ERP implementation, as handling it could have given KSMV significant benefits that would have positively affected many of the other CSFs.

7.2 Implications for research and practice

This study contributes to the literature focusing on change management in ERP implementations in SMEs. More specifically, it contributes to the emphasizing on people-related issues, rather than technical-related issues, for achieving successful ERP implementation. Also, it provides increased and rich insight into *how* and *why* change management is challenging in an SME context by detailing eight key reasons behind 33 challenges. Moreover, it delivers such insight in a Norwegian context, focusing on the experiences of a traditional mechanical manufacturing company.

The literature review identified that different CSFs might vary in their relative importance. However, some CSFs were highlighted as more important than others, such as communication and training (see e.g., Park, 2018; Reitsma & Hilletofth, 2018; Somers & Nelson, 2004). This study details why the CSFs are important to manage, and it presents insight into eight key reasons that make change management challenging. It details the importance of considering culture, overall organizational workload, and ensuring deep engagement, which receives little attention in the literature. Previous research argues that a specific context may affect the relative importance of CSFs (Snider et al., 2009). This study exploits an interpretive, explanatory approach achieving rich insight into *how* such challenges were unfolded in a specific context.

By having detailed the specific context, we invite practitioners for themselves to determine the level of generalizations that can be drawn. However, this study identified that ERP implementations should, in addition to the technical changes, emphasize the extensive organizational change it causes. Training programs should be developed and communicated to employees, employees should be invited to participate, and the change should be matured over time. This study also details the reasons for many challenges, which we suggest receive more attention in order to manage the change and reduce the number of challenges. Risk management proved to be challenging. However, we emphasize the importance of identifying risks and prioritize efforts according to the assessment of these.

7.3 Limitations and suggestions for future research

In chapter 4.10, we presented our methodological limitations. However, there are some general limitations we also wish to discuss. Firstly, the time frame for the thesis limited the scope. It forced us to distribute the available time between several seemingly endless and time-consuming activities such as to fully grasp the extensive literature, reaching data saturation, and analyzing qualitative data. However, we have tried to distribute our focus among these in order to best examine the challenges faced both theoretically and practically. Lastly, our non-probabilistic sampling techniques, in combination with the project manager's ability to manage our access to data, may have limited our ability to interpret the challenges wholesomely. However, our limitations do also provide some opportunities for further research.

With our literature review, it is evident that change management is critical to achieving successful ERP implementations. Moreover, the literature discusses how to conduct successful change management by detailing CSFs that managers should give focus. However, we identified a lack of consensus on the relative importance of these CSFs. It is argued that the contextual setting affects their importance (Snider et al., 2009), which our findings also emphasize and aligns with Rockart (1979) argument that the managers' perception affects the relative importance of CSFs. Thus, we propose additional explanatory case studies on change management throughout all phases of ERP implementations in similar contexts to be an interesting avenue for further research. We propose researchers to examine the reasons for change management challenges regarding CSFs, instead of ranking the CSFs. If a variety of

such studies are conducted, it would be interesting to identify general reasons for change management challenges that are tested empirically. By detailing the contextual reasons for the challenges, practitioners themselves can identify which reasons are likely to affect their implementation.

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9. Appendices

Appendix 1 - Concept-centric matrix of articles from the literature review

Articles / Categories	Management				Project							Organizational					Company size		
	Buisiness process reenginering	Risk management	Top management support	Vision for the change	Clear and systematic planning	Communication	End user involvement	Incentives	Project champion	Project management	Project teams	Company support / Sponsorship	Commitment to change	Organizational resistance management	Training and education	Management of expectations	SME	LE	Undefined
Al-Fawaz et al 2010	x		x			x	x		x	x	x				x				x
Doom et al 2009			x	x	x	x				x	x				x		x		
Drummond et al 2017	x		x	x		x				x	x		x	x	x		x		
Fui-Hoon et al 2001	x		x	x		x			x	x								x	
Hasheela et al 2017	x		x	x	x	x	x			x					x		x		
Hidayanto et al 2013	x		x	x		x			x		x						x		
Jiwasiddi et al 2018			x	x			x										x		
Kim et al 2016	x		x	x		x			x		x				x			x	
Malhotra & Temponi et al 2010		x				x								x			x		
Park 2018						x	x	x							x				x
Razmi et al 2009			x	x		x			x	x	x	x						x	
Reitsma & Hilletofth 2018	x		x			x				x	x				x				x
Schniederjans & Yadav 2013	x		x						x	x	x	x		x	x				
Shaul & Tauber 2012		x			x	x				x					x	x	x		
Snider et al 2009	x		x	x		x				x	x				x		x		
Somers & Nelson 2004	x		x	x		x				x	x				x	x		x	
Umble et al 2003			x							x	x				x			x	
Van & Kuzic 2011			x		x	x			x						x				x
Venugopal & Rao 2011			x			x												x	
Zabjek et al 2009	x		x			x	x			x		x			x				x

Appendix 2 - Information sheet

Vil du delta i forskningsprosjektet «Challenges of critical success factors for change management in SMEs ERP-implementation; A mixed method approach»?

Dette er et spørsmål til deg om å delta i et forskningsprosjekt hvor formålet er å se på utfordringer ved endringsledelse under implementering av et ERP system. I dette skrivet gir vi deg informasjon om målene for prosjektet og hva deltakelse vil innebære for deg.

Formål

Gjennom denne masteroppgaven vil vi se på utfordringer med kritiske suksessfaktorer for implementering av RamBase ved KSMV. Målet er å finne ut hva som er utfordringene med disse kritiske suksessfaktorene og til slutt rangere dem ut i fra hvor utfordrende de er. Dette vil gjøres gjennom en case studie der vi vil foreta intervjuer, observere og samle inn relevante dokumenter. Til slutt vil vi, dersom vi får tid, sende ut en survey til KSMV for å rangere faktorene.

Dette vil vi gjøre gjennom å svare på to forskningsspørsmål:

RQ1: What are the challenges of dealing with change management CSFs?
RQ2: What change management CSFs are most challenging to deal with?

Hvem er ansvarlig for forskningsprosjektet?

Universitetet i Agder, institutt for Informasjonssystemer er ansvarlig for prosjektet.

Hvorfor får du spørsmål om å delta?

Vårt studie fokuserer på ansatte i KSMV, og derfor får du spørsmål om å delta.

Hva innebærer det for deg å delta?

Hvis du velger å delta i prosjektet, innebærer det at du deltar i personlig intervju. Dette intervjuet vil ta deg ca 50 minutter og vi stiller spørsmål relatert til implementering av RamBase. Intervjuet vil bli tatt opp ved hjelp av godkjent opptaker fra Universitetet i Agder og deretter transkriberes og pall data.

Det er frivillig å delta

Det er frivillig å delta i prosjektet. Hvis du velger å delta, kan du når som helst trekke samtykke tilbake uten å oppgi noen grunn. Alle opplysninger om deg vil da bli anonymisert. Det vil ikke ha noen negative konsekvenser for deg hvis du ikke vil delta eller senere velger å trekke deg. Det vil ikke påvirke din rolle i KSMV, verken i forhold til sjef, mellomleder eller kolleger.

Ditt personvern – hvordan vi oppbevarer og bruker dine opplysninger

Vi vil bare bruke opplysningene om deg til formålene vi har fortalt om i dette skrivet. Vi behandler opplysningene konfidensielt og i samsvar med personvernregelverket. Kun veileder, og studentene som skriver oppgaven vil ha innsikt i personopplysningene. Dataene

lagres på forhåndsgodkjente medier og krypteres. Deltagere vil ikke kunne gjenkjennes i publikasjonen.

Hva skjer med opplysningene dine når vi avslutter forskningsprosjektet?
Prosjektet skal etter planen avsluttes 01.06.20. Ved prosjektets slutt slettes alle personopplysninger, og det gjøres også underveis når dataen er transkribert.

Dine rettigheter
Så lenge du kan identifiseres i datamaterialet, har du rett til:

- innsyn i hvilke personopplysninger som er registrert om deg,
- å få rettet personopplysninger om deg,
- få slettet personopplysninger om deg,
- få utlevert en kopi av dine personopplysninger (dataportabilitet), og
- å sende klage til personvernombudet eller Datatilsynet om behandlingen av dine personopplysninger.

Hva gir oss rett til å behandle personopplysninger om deg?
Vi behandler opplysninger om deg basert på ditt samtykke. På oppdrag fra Universitetet i Agder har NSD – Norsk senter for forskningsdata AS vurdert at behandlingen av personopplysninger i dette prosjektet er i samsvar med personvernregelverket.

Hvor kan jeg finne ut mer?
Hvis du har spørsmål til studien, eller ønsker å benytte deg av dine rettigheter, ta kontakt med: *Universitetet i agder, institutt for informasjonssystemer* ved student

- Student Ola Aulesjord Olsen, 93666444, olaao18@uia.no
- Student Erik Haaland, 46475253, erih14@uia.no
- Veileder Eli Hustad kan nåes på eli.hustad@uia.no, 38141621.
- Vårt personvernombud: personvernombud@uia.no
- NSD – Norsk senter for forskningsdata AS, på epost (personverntjenester@nsd.no) eller telefon: 55 58 21 17.

Med vennlig hilsen

Prosjektansvarlig	Student
Professor Eli Hustad	Erik Haaland og Ola Aulesjord Olsen

Appendix 3 - Consent declaration

Samtykkeerklæring

Jeg har mottatt og forstått informasjon om prosjektet "Challenges of critical success factors for change management in SMEs ERP-implementation; A mixed method approach», og har fått anledning til å stille spørsmål. Jeg samtykker til:

- å delta i *[intervju]*
- å delta i [spørreskjema]

Jeg samtykker til at mine opplysninger behandles frem til prosjektet er avsluttet, ca. 01.06.20

(Signert av prosjektdeltaker, dato)
Erik Haaland og Ola Aulesjord Olsen, 05.01.20

Appendix 4 - Interview guide

Introduksjon

Vi er masterstudenter ved institutt for Informasjonssystemer ved UIA, og skal dette halvåret skrive en oppgave i KSMV rundt implementering av RamBase.
Ved å belyse utfordringene kan det hjelpe dere i å implementere RamBase i de bedriftene dere har kjøpt opp. I tillegg vil innsikten gi bedre forståelse rundt utfordringer ved implementering av ERP systemer i små og mellomstore bedrifter til forskningsområdet..

Formål

Formålet med oppgaven er å beskrive deres utfordringer relatert til endringsledelse under implementeringen av RamBase (rom for omformulering avhengig av intervjuobjektet).

Konfidensialitet

For å kunne svare på problemstillingen vår er vi nødt til å snakke med de ansatte. I vår oppgave vil ikke navn eller noen annen informasjon som kan identifisere deg som person brukes. Denne dataen blir behandlet konfidensielt og vi benytter godkjente og sikre systemer tilhørende UiA for å lagre denne informasjonen. Sitater vil også anonymiseres.

Lydopptak

Kan vi ta opp intervjuet slik at vi kan analysere dette senere?
Informasjonsskriv og samtykkeerklæring

Tidsramme

Intervjuet tar ca 60 minutter

Avbryte intervju

Du kan når som helst i løpet av intervjuet trekke deg, og du kan også unnlate å svare på spørsmål uten å måtte begrunne hvorfor.

Om intervjuet;

Vi har X antall spørsmål som er nøye formulert og planlagt, og det er i hovedsak disse vi vil stille deg. Om du har noe å føye til ift. tematikken som vi tar opp er du hjertelig velkommen til å gjøre det. Vi kommer til å prøve å styre samtalen inn mot temaet som tas opp så om vi stopper deg underveis så er det ikke vondt ment.

Om intervjuobjektet

1. Kan du kort fortelle om din rolle og dine arbeidsoppgaver i KSMV?
2. Kan du kort fortelle om din bakgrunn og fartstid i KSMV?
3. Hva er din rolle i implementeringen av RamBase?
4. Har du tidligere erfaring fra bruk av lignende systemer, som RamBase?
5. Har du vært med på implementeringer av lignende systemer?

Kultur

1. Kan du fortelle om kulturen blant de ansatte på KSMV?
2. Hvordan har ansatte generelt stilt seg til endringer? Basert på dine erfaringer siden du begynte.
3. Hvordan tror du ansatte reagerer på de nye rollene og endringen i autoritet? Hvorfor?

Generell implementering av RamBase

1. Hvorfor implementerte dere RamBase?
2. Har du vært involvert i prosjektet? Hvordan har du vært involvert?
3. Har du noe kjennskap til fremgangen i prosjektet?

Personlig implementering av RamBase

4. Hva var forventningene dine til RamBase?
5. Levde RamBase opp til forventningene dine?
6. Hva gjorde du før RamBase, og hvordan gjør du det nå?
7. Hvordan har innføringen endret din arbeidshverdag?

Endringsvilje

8. Hvordan vil du beskrive din generelle vilje til å ta i bruk RamBase?
9. Hva er din motivasjon for å ta i bruk RamBase?
10. Har det vært anledning til å stille spørsmål rundt RamBase?
11. Kunne det vært gjort noe annerledes med tanke på kommunikasjon?
12. Oppfatter du RamBase som noe positivt, et hjelpende verktøy, eller er det noe negativt og forstyrrende?
13. I følge deg, hvordan har RamBase blitt mottatt av de ansatte? Har du lagt merke til noen positive eller negative tilbakemeldinger?

Opplæring

14. Har det vært vanskelig å lære bruken av RamBase?
15. Hvordan var opplæringen av RamBase?
16. Hvis du skulle beskrive den perfekte opplæringen, hvordan ville det vært?
17. Har det vært noen utfordringer med opplæring av systemet?

Utfordringer

18. Har du opplevd noe utfordrende med RamBase hittil?
19. Er det noen andre utfordringer dere har opplevd?

Ledelsens håndtering

20. Kan du fortelle hva ledelsen har gjort for at ansatte skal ta i bruk systemet?
21. Hvordan synes du ledelsen har håndtert implementeringen av RamBase?
22. Har du noen råd som ledelsen burde følge dersom de skulle implementere et nytt system en annen gang?
23. Er det noe du mener burde vært gjort annerledes?