Investigation of Critical success factors for ERP implementation

A user perspective
Acknowledgements

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Alexander Pettersson and Jonathan Desalegn
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Authors: Alexander Pettersson and Jonathan Desalegn

Tutor: Professor, Per Hilletofth

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Abstract

Background: Due to the rapid development of globalization, increased competition has led to significant market changes. Enterprise resource planning (ERP) has been a crucial part of gaining competitive advantage, but implementing an ERP system have shown to be complicated and expensive. Hence, understanding the critical success factors (CSF) when implementing an ERP system is vital as it can provide a successful implementation. Previous research has mainly focused on the general perspective, whereas the user perspective towards the CSFs has been lacking. This thesis complements the research by concentrating on the operational user and their perception towards the importance of each CSF as well as in which implementation phase each CSF is essential.

Purpose: The purpose of this study is to investigate the CSFs of an ERP implementation from a user perspective and why these are important in different implementation phases.

Method: As this study adopted a qualitative approach, a multiple case study of three case companies was conducted with an inductive research approach. The empirical data have been gathered through semi-structured interviews. A theoretical framework has been used for the literature in this study. The empirical data was then analyzed and compared to the literature. By analyzing the data in a within-case analysis before combining the findings in a cross-case analysis, it enabled the possibility to compare and derive a conclusion covering all case companies.

Conclusion: The results of this thesis shows that users from the case companies believed that more users should be involved in the ERP implementation. Furthermore, two case companies believed each 13 CSFs to be critical in an ERP implementation, whereas one case company believed 12 CSFs to be important. Where the CSFs ‘minimum customization’, ‘education and training,’ ‘technical possibilities' and ‘performance measurement' were perceived to be essential in this study compared to previous research when users did not perceive these CSFs as important. Lastly, a first attempt at grouping the CSF with the phases of an ERP implementation was made. The findings from the cross-case analysis revealed that there is a shared perception across some of the companies of why the CSFs are essential concerning the specific phases.
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List of Abbreviations

CSF       Critical success factor
ERP       Enterprise resource planning
IT        Information technology
1 Introduction

The first chapter of this thesis contains information and background of the research to build an understanding of the study. The introduction then continues where a discussion regarding the problem will be explained before moving on to the purpose, and its linking research question will be explained. In the following section, the scope and delimitations will be clarified and finally, the outlook, of the different chapters in this thesis, will be described.

1.1 Background

Due to the progress of globalization, increased competition from domestic and foreign competitors have led to significant market changes (Hilletofth, 2010). Thus, apart from confirming their successful operations, organizations must be able to establish highly responsive supply chains (Su & Yang, 2010). A well-working supply chain management, can work as a digital midpoint for the whole organization, and help reduce cost notably concerning order fulfillment, as it can deliver flexibility and agility to be in control of their businesses (Motiwalla & Thompson, 2012).

Starting in the late 80's and the beginning of the 90s, companies in the 21 centuries have understood the value of having a successfully implemented Enterprise Resource Planning (ERP). Researchers have claimed that the ERP systems are one of the primary keys for gaining competitive advantage in the market and to optimize an entire supply chain (Gunasekaran et al., 2008).

The use of ERP systems is a requirement for organizations searching for rapid and efficient business operations (Hilletofth et al., 2010). The competitive advantage that organizations will get in return from having a well-developed and integrated ERP system comes in different ways, such as reduction of cycle time, quicker transactions, integrating the entire organization and providing real-time information (Mabert et al., 2000). Cox et al. (2000) reported that an ERP system can be seen as the spine in an organization and helps to respond swiftly to customers and suppliers. Different definitions have been done by researchers of what ERP is and what it can accomplish. Nah et al. (2001), defined ERP as: "a packaged business software system that enables a company to manage the efficient and effective use of resources (materials, human resources, finance)." Su and Yang (2010) claim that one noteworthy feature of ERP systems is
that the activities a firm performs is automated and improved significantly due to best practices, quicker decision making and reduction of cost.

According to Motiwalla and Thompson (2012), it is critical to have a well-working ERP-system to survive in the global competitive environment. In highly competitive markets, organizations must focus on the customer and be cost-efficient and thus, requires cross-functional integration between the different departments in an organization to be successful (Motiwalla & Thompson, 2012). An ERP system delivers a total integrated solution for the entire organization (Nah et al., 2003), and the system can help facilitate the information flow within a department, as well as across various departments within an organization (Gibson et al., 2005). This allows organizations to provide real-time information flows between the various departments within an organization (Motiwalla & Thompson, 2012).

The implementation project of an ERP system can be a complicated activity and requires strong project management as the project must frequently be evaluated (Motiwalla & Thompson, 2012). Furthermore, researchers argue that there is a high level of technical complexity related to the implementation of an ERP system and that many organizations do not have the knowledge and skills needed to successfully conduct an implementation project (Markus et al., 2000).

Subsequently, many firms decide to buy an ERP system instead of developing it internally and instead outsource it to firms who have their core competency in ERP. However, this does not necessarily mean that the implementation automatically will be successful. Several multinational companies have implemented new ERP systems that have resulted in various problems which in worst cases has led to abandoning the implementation projects (Soh et al., 2000).

Although ERP systems are a requirement for many businesses, the amount of implementation failure is high (Aloini et al., 2007). The reason why ERP implementations fail has been discussed in the previous literature as researchers attempt to identify how to increase the probability of a successful ERP implementation. Scientists identified critical success factors (CSFs), and these have mainly been investigated from a generic perspective (Chang et al., 2014; Lech, 2016; Saade & Nijher, 2016). By putting increased attention on the CSFs, organizations might recognize a smoother implementation of the ERP system (Huang et al., 2004). Users
should be involved from the early stages of the implementation project, as their involvement in the ERP implementation increases the possibility of having a successful implementation (Davenport, 1998; Motiwalla & Thompson, 2012). Limited research is available considering the user’s perception concerning ERP implementations (Young et al., 2012).

1.2. Problem discussion

Even though ERP systems support the organization by sharing data, diminishing costs and improve the management of the processes, many projects of ERP systems fail (Liu & Seddon, 2009). Research has revealed that as many as three-quarters of all ERP implementations that are conducted are unsuccessful (Hong & Kim, 2002). Due to these high rates of failure and the difficulties the implementation brings to a company, more attention to this matter has been given by researchers to better understand this phenomenon (Liu & Seddon, 2009). However, the available research is limited due to most of the focus has been put on CSFs on a generic perspective (Chang et al., 2015; Lech, 2016; Saade & Nijher, 2016).

Using this perspective, the focus of the CSFs for the prevention of a failed implementation is putting more emphasis on the general perspective along with a ranking of CSFs made by senior managers rather than taking the users who are operating the system into consideration (Amoako-Gyampah, 2004). Since the implementation will be the reason for significant adjustments to the users regarding changing the nature of tasks, workflows and the job itself (Morris & Venkatesh, 2010). The importance of understanding and managing the views of the users during the implementation is therefore crucial since if the organization does not emphasize it, it will be one of the main reasons to why the implementation fails (Bala & Venkatesh, 2013). However, even though users are considered crucial to achieve a successful ERP implementation, insights into their perspective has not caught much attention (Liang et al., 2007; Kwak et al., 2012).

Four phases for the implementation of an ERP-system have been conceptualized by researchers as "chartering," "project," "shakedown" and "onward and upward" (Markus & Tanis, 2000). Loh and Koh (2003) further categorized the four phases by placing the “chartering” within the pre-implementation phase, project and shakedown within the implementation phase, and onward and upward within the post-implementation phase. Researchers agree on that in the “shakedown” phase the majority of the changes and shock from the entire implementation phase will take place (Alvarez, 2008; Gattiker & Goodhue, 2005; Hakkinen & Hilmola, 2007; Peppard...
& Ward 2005). However, previous research relating the CSFs to the phases within an ERP implementation is limited (Loh & Koh, 2003).

1.3 Purpose and research question

As previously discussed, research has shown that implementation projects still are facing issues even with the provision of critical success factors to achieve a successful implementation. These critical success factors are mainly focused on the generic perspective, whereas the user perspective has not been given the same attention. This presents a gap in the literature which requires further investigation to get a deeper insight into how the users perceive these CSFs, which would be of value for future ERP implementations. Furthermore, research has mostly been based on the implementation on a general basis and not on why the users apprehend the CSFs to be significant within the different phases. This presents another gap in existing research that needs investigation as the understanding of why the users are relating the CSFs to the phases would provide knowledge on why they require more attention in specific phases. By filling these gaps, a greater understanding of users and their insights into how the CSFs are important and why they are essential for the specific phases of an ERP implementation will be provided. Thus, the purpose of our research is:

"To investigate the CSFs of an ERP implementation from a user perspective and why these are important in different implementation phases."

To fulfill the purpose of this thesis, two research questions need to be answered to fill the research gaps. Based on the framework by Reitsma and Hilletofth (2017) providing an updated set of CSFs, the first step to reach the purpose is to reveal how the users perceive these CSFs. Thus, the first research question is:

- How are the critical success factors for the implementation of an ERP system apprehended from a user perspective?

When the perception of the CSFs has been investigated, the reasoning of why they are considered important within the phases of an ERP implementation needs to be determined. Thus, the second research question of this thesis is:

- Why are the investigated critical success factors important within the implementation phases from a user perspective?
To answer the research questions and reach the purpose, a holistic multiple case study including three Swedish companies that have implemented ERP systems will be conducted. The goal is that the findings of the research questions will provide insights of value for practitioners and researchers that further narrows the identified research gaps.

1.4 Scope and delimitations

The scope of this study is illustrated in Figure 1. This thesis will be investigating critical success factors in ERP implementation using the framework made by Reitsma and Hilletofth (2017) to achieve a better understanding of the perceptions of the users connected to these. ERP operational users in this study will be defined as employees of the organization that operates the system on a day-to-day basis. For a user to be included in this study, the person must have been part of the organization when the ERP system was implemented. The delimitation for this study is that only the perceptions of the users will be investigated meaning that the perspectives of end-users, IT-support, developers, project leaders or senior management will not be investigated.
Figure 1: Research scope 1
1.5 Outline of the thesis

This chapter covers the overall introduction (see Figure 2), where the background to the thesis and a problem statement is presented as well as the purpose and our research questions. Moreover, the scope and delimitations will be presented.

Figure 2: Outline of the thesis 1
The second chapter covers the research methodology used in this thesis, containing research philosophy and approach, research strategy, data collection, and analysis, as it ends with the research quality of the thesis. The third chapter is dedicated to the frame of reference and will contain relevant literature regarding implementation ERP system and hence, the critical success factors related to the implementation. The following part of this study, empirical findings, and analysis of current theory will be shown. In the fifth chapter, we then conclude this thesis and end it with a discussion, regarding the thesis, in the final section.
2 Research method

In this chapter, the entire research methodology process was designed and displays how the study was conducted. In order to clarify how the study was designed, a clearer understanding regarding how this study is constructed will be provided in this chapter.

2.1 Research philosophy

As the starting point for the study, assumptions on how the researcher sees the world and its objects have to be embraced. These assumptions are derived from research philosophies which affect the researcher's view of how knowledge is developed along with its nature (Saunders et al., 2016). First, the ontological viewpoint was considered which holds assumptions on nature of reality (Easterby-Smith, Thorpe & Jackson, 2015). This study follows the ontological view of subjectivism as "social phenomena are created from the perceptions and consequent actions of social actors" (Saunders et al., 2016, p.111). As different organizations and users will be involved, we assumed that the perceptions of the users are unique and thus, there is no single truth as the perception might differ among the participants. This means that the perception of the CSFs depends on the viewpoint of the observer, which in this case is the participating users.

Following the ontological perspective, an epistemological position had to be adopted. The Epistemology holds assumptions on what knowledge is acceptable in the chosen type of study (Easterby-Smith et al., 2015; Saunders et al., 2016). Within this thesis, the aim was to get an understanding of the view of the users by inducting their perception into factors identified in the literature. Hence, the epistemological view of interpretivism was followed since we wanted to study differences between humans taking part as social actors that provide a subjective insight into their interpretations and actions connected to the researched phenomenon (Saunders et al., 2016). This allowed us to get an insight into the perspective of the users and understand the details of the situation which in this case is the ERP implementation.

2.2 Research approach

There are three types of approaches that should be attached to the philosophy of the study, being a deductive approach, inductive approach or abductive approach. (Saunders et al., 2016). Researchers uses the inductive approach to formulate theories based on empirical data gained from qualitative methods. We want to investigate the perceptions of the users to develop an
understanding of CSFs that have been identified in an existing framework from previous academic research. Hence, this study follows the inductive approach since it allows to “gain an understanding of the meanings that humans attach to events” (Saunders et al., 2016, p.127). The approach also follows the adopted epistemology of interpretivism (Saunders et al., 2016). This is considered to be best suited for this study as the theory then is built on the knowledge of the participants.

Following the approach, the type of method is chosen. Saunders et al. (2009) claims that research can be conducted by choosing between adopting a qualitative, quantitative or a mixed method, which means that the research contains both designs. Qualitative research mainly focus on words and images and can provide a deeper understanding of a phenomenon (Bryman and Bell, 2011). The use of a qualitative method is connected to the epistemology of interpretivism as well as the inductive approach (Saunders et al., 2016). The focus of this thesis is on qualitative research design since this provides the opportunity to obtain a more in-depth knowledge and profound understanding of the CSFs for ERP system implementation from the user perspective.

The framework of Reitsma and Hilletofth (2017) provided 13 critical success factors that were used as factors of investigation. The next step of the study was to gain empirical evidence of the perception of the CSFs in ERP system implementation by conducting semi-structured interviews. Subsequently, the interviews provided an opportunity to get a deeper insight of the CSFs and gain in-depth knowledge of how the users of the ERP system believe the CSFs to be important in order for an ERP implementation to succeed.

2.3 Research design
The research strategy is defined as being the procedure of how the researcher will progress performing certain actions and methods to answer the research question(s) (Saunders et al., 2009). Due to the chosen philosophy being interpretivism, the adoption of a case study was considered since it is assisting the researcher to explore and understand the context of a specific situation which would be directly connected to the purpose of this study. In addition, researchers emphasize the ability of the case study to assist in generating answers to the questions starting with ‘why’, ‘how’ and ‘what’, especially the ‘why’ question (Saunders et al., 2009). The ability to answer the question ‘why’ provides an advantage for this study due to
being able to gain a deeper understanding of why certain CSFs are important to ERP system users. This is supported by Morris and Wood (1991), who emphasizes that the case study strategy should be considered if the goal is to gain a deeper understanding of the context of the research. Hence, the case study strategy is matching an explorative type of study.

Literature presents four different kinds of case studies based on two dimensions namely: single case or multiple case; holistic case or embedded case (Yin, 2003). Due to the purpose of the study being to investigate existing CSFs and to see how these affect the users within the phases of an ERP implementation project, a holistic multiple case study was chosen. The holistic type of case study is described as method of investigating an organization as a whole and not investigate specific subgroups within the organization. Furthermore, the multiple type of case study will let the researcher investigate the phenomenon within more than one organization (Saunders et al., 2009; Yin, 2011). Hence, the holistic multiple case study allowed users with different functions to provide empirical data that was representative for several unique organizations. To gather the empirical data, a semi-structured interview guide was created to collect primary data from participants which then was used to find direct replications across the cases to be further analyzed and compared with the literature (Saunders et al., 2009; Yin, 2011).

For the selection of cases for our multiple case approach, a non-probability sampling was chosen since the selection was not based on either probability or statistical evaluations (Cooper & Schindler, 2011; Bryman & Bell, 2007). When the researchers decide what cases to consider in the sample, it is of a judgmental nature. According to Saunders et al. (2012), this approach is advantageous for smaller sample sizes as when conducting case studies. Moreover, the connection between cases in terms of belonging to the same sub-group is important, this is called homogenous sampling (Cooper & Schindler, 2011; Saunders et al., 2012). For this thesis, the sampling criteria for selection were companies with the origin in Sweden that have implemented an ERP system within the last 5 years.

The first step was to identify companies that had undergone an ERP implementation, to assist in finding these, we approached consultancies that specialize in ERP system implementation as well as searching for companies on the web. Approximately 35 companies from the web that were identified as potential participants were contacted and the consultancies provided six potential case participants for the study. Three of the companies provided from the
consultancies matched the selection criteria and were willing to participate in the study. Initially, five participants per company were provided and agreed on participating in the study. However, due to four failing to meet the criteria of being considered users and two did not have time to participate. This resulted in nine interviews being conducted by telephone. Telephone interviews were conducted due to the two authors being located in different countries and due to financial- and time constraints. Moreover, long distances between the authors and two of the companies led to the decision to only conducting telephone interviews. According to Saunders et al (2009), telephone interviews allows contact with respondents whom it would be difficult to conduct a face-to-face interview with because of the distance and time required. Furthermore, adopting telephone interviews allowed speedier data collection and lower cost.

Table 1: Overview of the Case Companies

<table>
<thead>
<tr>
<th>Participant number</th>
<th>Company name</th>
<th>Interview date</th>
<th>Type of interview</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>Company A</td>
<td>2018-04-06</td>
<td>Telephone</td>
<td>50 min</td>
</tr>
<tr>
<td>Participant 2</td>
<td>Company A</td>
<td>2018-04-12</td>
<td>Telephone</td>
<td>80 min</td>
</tr>
<tr>
<td>Participant 3</td>
<td>Company A</td>
<td>2018-04-12</td>
<td>Telephone</td>
<td>55 min</td>
</tr>
<tr>
<td>Participant 4</td>
<td>Company A</td>
<td>2018-04-13</td>
<td>Telephone</td>
<td>50 min</td>
</tr>
<tr>
<td>Participant 1</td>
<td>Company B</td>
<td>2018-04-16</td>
<td>Telephone</td>
<td>100 min</td>
</tr>
<tr>
<td>Participant 2</td>
<td>Company B</td>
<td>2018-04-17</td>
<td>Telephone</td>
<td>60 min</td>
</tr>
<tr>
<td>Participant 1</td>
<td>Company C</td>
<td>2018-04-05</td>
<td>Telephone</td>
<td>80 min</td>
</tr>
<tr>
<td>Participant 2</td>
<td>Company C</td>
<td>2018-04-10</td>
<td>Telephone</td>
<td>70 min</td>
</tr>
<tr>
<td>Participant 3</td>
<td>Company C</td>
<td>2018-04-16</td>
<td>Telephone</td>
<td>100 min</td>
</tr>
</tbody>
</table>

2.4 Data collection

Bryman and Bell (2011) claim that data collection for research is dependent on the methodological approach that was adopted. Since a qualitative methodological approach was used for this study, the data collection was achieved by using a mono-method approach. This type of method is collecting data using a single qualitative data collection technique, for instance interviews and qualitative data analysis procedures (Saunders et al., 2009).
Yin (2013) listed six different ways on how to collect data in case studies and for this thesis, the most appropriate tool was to collect data through interviews. The strengths of using interviews for data gathering is that the target is clear, its focus is just on the research topic and a larger understanding can be gained (Yin, 2013). Rubin and Rubin (2011) argued that three different forms of interviews can be applied; unstructured, semi-structured and structured. For this thesis, 13 critical success factors were investigated from the perspective of the user, hence it is vital that the interviews proceed from the CSFs.

The interviews for this study followed a semi-structured technique to collect primary data and to keep the dialogues fluid. According to Saunders et al. (2009) semi-structured interviews allow the interviewees to further explain their responses and this type of interview is particularly important when conducting an interpretivist epistemology, as a deeper understanding of a specific phenomenon can be fulfilled. In order to answer the research questions, an interview guideline was created and were based on the 13 CSFs. The interviews were completed in the same way for all participants, as this would increase comparability as well as identification of patterns.

2.5 Data analysis

Due to the adoption of a qualitative research approach for this study, data analysis in form of content analysis is often used. Content analysis is a method were the aim is to draw “systematic inferences from qualitative data that have been structured by a set of ideas or concepts” (Easterby-Smith et al., 2015. P. 188). Three different kinds of content analysis are distinguished in the literature, namely conventional content analysis, directed content analysis and summative content analysis (Hsieh & Shannon, 2005). The difference among these kinds of analysis is mainly on the establishment and development of codes.

According to Kyngas and Vanhanen (1999), in the directed content analysis the coding takes place before the analysis of empirical data using existing theories and previous research as input. Hence, this study adopted the directed content analysis as the study started with using an existing framework including critical success factors for ERP system implementation projects as a base for investigation. According to Hsieh and Shannon (2005), directed content analysis provides an opportunity to investigate if the existing theory is accurate and if theory can be extended with new research. Thus, this study gained fundamental knowledge from existing
theories to further explore if the current CSFs could be supported by the empirical findings and allowed us to further investigate if the findings could increase the reliability of the CSFs.

The codes from the existing framework were then compared to the empirical data gained from the semi-structured interviews. This provided an opportunity to further investigate and understand how the ERP users relate to the existing CSFs. First, the interviews had to be transcribed to text in a document. The empirical findings were then analyzed for each case individually to later be combined in a cross-case analysis. Extracted empirical data from the interviews was compared to identify direct replications across the different cases (Yin, 2011). The replications then contributed with providing findings about the CSFs that represented the participants across all the cases of the study.

2.6 Research quality

This part of the study as shown in Table 3, will focus on how to reduce risks that can have a negative effect on the quality of the research. As this study follows a qualitative research design, qualitative assessment criterions were applied. Thus, the quality of this study was measured by using Lincoln’s and Guba’s (1985) criterions of trustworthiness for a qualitative study, namely credibility, transferability, dependability and confirmability. Weber (2004) claims that within the interpretive tradition, these four criterions are most suitable in order to contribute with a trustworthy report.
<table>
<thead>
<tr>
<th>Trustworthiness criteria</th>
<th>Description</th>
<th>For this study</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Credibility</strong></td>
<td>Focus is on how appropriate the data collection was done to fulfill the purpose of the study. Helps researchers understand whether other would reach comparable results when analyzing the same material (Eriksson &amp; Kovalainen, 2008)</td>
<td>Data were gathered from various companies, which can strengthen the research conclusion. Both authors reviewed all articles to assure an appropriate data collection process and avoid misunderstandings. Moreover, to emphasize and strengthen the credibility of the study, the method, process of data collection and data analysis was presented. According to Bryman and Bell (2011), this express credibility as well.</td>
</tr>
<tr>
<td><strong>Dependability</strong></td>
<td>Refers to ensuring the trustworthiness of research and the conclusion of the study can be repeated by future researchers (Eriksson &amp; Kovalainen, 2008).</td>
<td>For this study, all data that was gathered from interviews was transcribed and documented, which increases openness and availability of the data.</td>
</tr>
<tr>
<td><strong>Transferability</strong></td>
<td>Transferability refers to findings that can be applied and valid in another research setting (Polit &amp; Beck, 2012). A qualitative study has complete transferability when others who are not involved in the research can associate with the results from their own experiences (Cope, 2014).</td>
<td>The result of this study provided a deeper insight and understanding on the CSF’s for ERP system implementations. Hence, reaching transferability for future researchers in the further development of CSFs and their shifts in importance within the phases of the implementation.</td>
</tr>
<tr>
<td><strong>Confirmability</strong></td>
<td>Confirmability refers to the transparency of the collected data from interviews where the replies of the participants are not colored by the researchers bias and beliefs (Polit &amp; Beck, 2012; Cope, 2014).</td>
<td>By demonstrating that the origin of the empirical findings coming directly from the collected data, quotes of the participants was provided that represent the research participant’s own opinion. Moreover, notes, recordings and transcripts of data from the interviews was saved and made available. This allows to increase confirmability as external persons can comprehend how the results of the study was reached (Lincoln &amp; Guba, 1985).</td>
</tr>
</tbody>
</table>
2.7 Research ethics

Moreover, ethical behavior is another critical factor that affect the quality of the study. Hence, ethics must be considered and studied as a vital aspect and taken into consideration when conducting research (Bryman & Bell, 2007). Subsequently, this part of the study demonstrates how the ethical considerations were applied. Bryman and Bell (2007) emphasized on ethical principles to be considered as relevant for the interviews and identified ten ethical principles which were adopted for this study, which is shown in Table 4.
Table 3: The ten ethical principles

<table>
<thead>
<tr>
<th>Ten ethical principles of Bryman and Bell</th>
<th>How each principle was conducted for this study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensuring that no harm comes to the participants</td>
<td>No personal information that could harm the participants was published</td>
</tr>
<tr>
<td>Respecting the dignity of the of research participants</td>
<td>The dignity of the research participants was fully respected</td>
</tr>
<tr>
<td>Ensuring a fully informed consent of research participants</td>
<td>The participants were fully familiar with the purpose and the research questions related to the study before the interviews were conducted</td>
</tr>
<tr>
<td>Protecting the privacy of research participants</td>
<td>We were protecting the privacy and removed any information leading to identification of the participants</td>
</tr>
<tr>
<td>Ensuring the confidentiality of research data</td>
<td>The research participants had the opportunity to review the included data before it was published.</td>
</tr>
<tr>
<td>Protecting the anonymity of individuals or organizations</td>
<td>No personal information was announced without any confirmation from the research participants or the organizations</td>
</tr>
<tr>
<td>Avoiding deception about the nature or aims of the research</td>
<td>The empirical findings were entirely the participant’s definitive opinions to reduce bias</td>
</tr>
<tr>
<td>Declaration of affiliations, funding sources and conflict of interest</td>
<td>The research question and purpose of the study was clearly understandable</td>
</tr>
<tr>
<td>Honesty and transparency in communicating about the research.</td>
<td>The interviews were conducted in an honest and transparent manner</td>
</tr>
<tr>
<td>Avoidance of any misleading or false reporting of research findings</td>
<td>Before publishing this study, the research participants had the opportunity examine the results to ensure that no misleading or false report is presented</td>
</tr>
</tbody>
</table>
3 Frame of reference

This chapter will provide the literature that is chosen and will serve as theoretical foundation of the study in order to analyze an existing framework and compare to the empirical findings. The 13 critical success factors investigated in the framework is individually summarized and explained from the user perspective. Each CSF are then linked to its related phase of an ERP implementation. By steering the frame of reference in this order will allow the study to answer both research questions.

3.1 Introduction

This literature review is based on the research of Reitsma and Hilletofth (2017) as shown in Table 4, as they identified 13 CSFs within ERP system implementation with a focus on the user perception. The framework provides an overview of the CSFs as well as an investigation of the importance of these from a user perspective. This provides a necessary foundation for this study since the perspective of the user is in focus. The frame of reference will aid the study and must be fulfilled for the interview guideline to be completed and finally the research questions to be answered.

In this chapter, the 13 CSFs will first be explained on a general level to then be described on a perspective level covering three perspectives namely, users, senior managers, and project managers. The perspective of the users will be explained more in detail, whereas the other two perspectives briefly presented.

Table 4: Framework of CSFs for ERP system implementation, based on Reitsma and Hilletofth (2017).

<table>
<thead>
<tr>
<th>Project team</th>
<th>The project team needs to consist of the best people and has to include a project champion, employees from different functions and levels, and external consultants when ERP expertise is missing internally</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top management involvement</td>
<td>Top management should reinforce the commitment of all employees in the organization and create policies that determine and approve new organizational structure, roles, and responsibilities</td>
</tr>
<tr>
<td>Strategic decision-making</td>
<td>A well-defined business plan and vision should define how the organization operates behind the implementation effort and has to outline proposed strategic and tangible benefits, resources, costs, risks and timeline</td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Communication</td>
<td>Effective communication should be established at every organizational level and has to include the formal promotion of the project and its teams and advertisement of project progress</td>
</tr>
<tr>
<td>Project management</td>
<td>Project management should include a clear definition of objectives, development of both a work and a resource plan has to focus on the identification of the equipment required to operate the system.</td>
</tr>
<tr>
<td>Project support</td>
<td>Project support should be established in the form of technical assistance, maintenance, and updates, which has to be facilitated by a committed partner that oversees the entire implementation’s life cycle.</td>
</tr>
<tr>
<td>Minimum customization</td>
<td>Departments should not rearrange the chosen ERP system to prevent interdepartmental issues and should have access to the same data and system.</td>
</tr>
<tr>
<td>Organizational change management</td>
<td>The organization should utilize change management techniques and tools that must be defined and evaluated with the best practices in the industry.</td>
</tr>
<tr>
<td>Business process alignment</td>
<td>A catalog of best business processes should be selected and followed to stay on the right track and avoid conflicts with the procedural rigidity of an ERP system.</td>
</tr>
<tr>
<td>Software testing</td>
<td>The organization should establish rigorous and sophisticated testing of the software to simplify ERP system implementation</td>
</tr>
<tr>
<td>Performance measurement</td>
<td>Performance measurements should be identified to manage expectations, keep track of all occurrences and to measure the achievements against the milestones and targets.</td>
</tr>
<tr>
<td>Education and training</td>
<td>Education and sufficient training requires investment, promotes an effective and correct use of the ERP system, and should be provided for users from the beginning of the ERP system implementation project.</td>
</tr>
<tr>
<td>Technical possibilities</td>
<td>All kinds of differences in ERP systems offered in the marketplace should be evaluated based on its strategy, size, business field, its business processes, and its internal and external relationship structure.</td>
</tr>
</tbody>
</table>
3.2 Critical success factors

3.2.1 Project team
The first CSF within the framework was identified as 'project team' (Laughlin, 1999; Nah et al., 2003; Wang et al., 2008). A project team of an ERP implementation generally include top management, a project leader and usage of a project team that can provide a successful implementation by allowing a mix of IT personnel and users with an understanding of organizational processes (Shanks et al., 2000; Wang et al., 2008). A project team must be composed into a cross-functional group which consists of knowledgeable consultants along with users to improve required technical skills needed for design and implementation (Somers & Nelson, 2001; Sumner, 1999; Woo, 2007). Somers and Nelson (2001) argued that the success of an ERP system implementation often is related to the presence of having a project champion who owns the project, communicate the development of the project to the employees and who understand the business and organizational context.

3.2.2 Top management involvement
The second CSF within the framework was identified as 'Top management involvement' (Ehie & Madsen, 2005; Dezdar & Sulaiman, 2009). Top management involvement is critical in the early stages of the ERP implementation to provide leadership, essential resources and dealing with resistance from employees (Bingi et al., 1999; Laughlin, 1999; Shanks et al., 2000).

3.2.3 Strategic decision making
The third derived CSF within the framework was identified as 'strategic decision making' (Dezdar & Sulaiman, 2009; Motwani et al., 2005). In-Depth strategic thinking can result in improved understanding of a company's business processes and is critical when implementing an ERP system as well as developing a business case to provide an understanding of the ERP system (Ehie & Madsen, 2004; Gargeya & Brady, 2005). Clear goals, as well as a business plan, are essential factors for a project to succeed, where the business plan should include strategic and tangible benefits, resources, costs, risks and its timeline (Holland et al., 1999; Nah et al., 2003; Rosario, 2000).
3.2.4 Communication

The fourth CSF used within this framework was identified as ‘communication' (Loh & Koh, 2004; Sumner, 2000). Communication amongst the different systems and functional divisions in the organization is vital to the success of ERP implementation (Davenport, 2000; Xu et al., 2002). Expectations from the management must be communicated at every level of the organization and input from the user must be handled effectively to share their requirements, comments, reactions and their approval (Loh & Koh, 2004; Rosario, 2000).

3.2.5 Project management

‘Project management' was the fifth identified CSF within the framework (Dezdar & Sulaiman, 2009; Saade & Nijher, 2016; Umble et al., 2003). It is required to have effective project management by establishing a project team with clear responsibilities to reach a particular organizational goal to achieve a successful implementation project (Ehie & Madsen, 2005; Loh & Koh, 2004; Umble et al., 2003). Furthermore, it is vital that project management involve the establishment of clear project targets, definitions of performance objectives, work, and a resource plan as well as tracking of the project process for the project to succeed (Ehie & Madsen, 2005; Laughlin, 1999).

3.2.6 Project support

‘Project support' was the sixth identified CSF within the framework (Dezdar & Sulaiman, 2009; Wang et al., 2008). For the ERP system implementation to succeed, project support is a vital factor as it involves technical assistance, updates, emergency maintenance and training for the users. Especially when the needed technical- and transformational competence within the company is not available (Bingi et al., 1999; Somers & Nelson, 2001; Sumner, 2000; Wang et al., 2008).

3.2.7 Minimum customization

The seventh CSF identified within the framework was ‘minimum customization' (Saade & Nijher, 2016; Saini et al., 2013; Somers and Nelson, 2001, Ziemba & Oblak, 2013). By customizing the ERP software, the implementation process will require a long time before going live (Bingi et al., 1999). According to Nah et al. (2003), it is vital to have a stable and successful business setting. Data and information systems must be available and open through the entire organization which will allow data exchange across all departments (Dowlatshahi, 2005). According to Somers and Nelson (2004), correct data
is a critical requirement for the efficient use of an ERP system and to prevent any disputes amongst user departments, and management must assure that no department include any changes of the ERP system (Huang et al., 2004).

3.2.8 Organizational change management

The eighth CSF identified within the framework was ‘organizational change management’ (Dezdar & Sulaiman, 2009; Rosario, 2000). Change management can have a significant influence on the implementation process (Rosario, 2000). Insufficient preparation for the imminent changes and lack of employee motivation methods can have an adverse outcome concerning unwillingness to the new ERP system. To overcome resistance, it is required to have a proper change management plan that covers the entire implementation process (Laughlin, 1999; Loh & Koh, 2004; Shanks et al., 2000).

3.2.9 Business process alignment

The ninth CSF identified within the framework was ‘business process alignment’ (Dezdar & Sulaiman, 2009; Holland et al., 1999; Motwani, 2005. By re-engineering processes, the culture and information across the entire organization will be altered and by cleaning up processes a more balanced approach between the vendor and implementing organization can be achieved (Davenport, 2000; Gargeya & Brady, 2005). Implementation of an ERP system requires re-engineering of its business process, and when conducted appropriately, organizations find it easier to eliminate reluctance of change from the users (Huang et al., 2004). It is critical that the business process match the functionality of the ERP system and an organization cannot increase its performance without changing its business processes (Somers & Nelson, 2001; Bingi et al., 1999).

3.2.10 Software testing

The tenth CSF identified within the framework was ‘software testing' (Dezdar & Sulaiman, 2009; Singla & Goyal, 2006). Testing the new ERP system before going live has been recognized as a key factor for having a successful implementation (Gargeya & Brady, 2005). Organizations often regret not spending sufficient time and allocating more attention to testing the software and changes that can occur throughout the implementation project (Davenport, 2000). According to Rosario (2000), rigorous and sophisticated tests of the software can simplify the implementation, and a plan for migrating and cleaning up data should be developed to smoothen the process for the ERP implementation project (Huang et al., 2004; Maguire et al., 2010).
Chang et al. (2014), Nah et al. (2003) and Singla & Goyal (2006) agreed with the generic perspective regarding software testing and argued the importance of performing adequate testing of software before going live with the system.

3.2.11 Performance measurement
The eleventh CSF identified within the framework was ‘performance measurement’ (Dezdar & Sulaiman, 2009; Wang et al., 2008). Performance measurement is an essential element as it aids to identify gaps and flaws in how the organization performs (Loh & Koh, 2003). By using quantifiable measures such as cycle time reduction, increased marked revenue and expected implementation time, organizations can develop a better understanding of ERP implementation success (Ehie & Madsen, 2005). As suggested by Roberts & Barrar (1992), two criterions can be used in performance measurement. Project management criteria allow organizations to measure completion dates, cost, and quality. Operational criteria aid to measure against the production system. Loh and Koh (2004) claimed that performance measurement is essential to acquire an overview of the progress and must be measured against the project goals as well as monitored against the milestones and targets.

3.2.12 Education and training
The twelfth CSF identified within the framework was ‘Education and training’ (Aloini et al., 2007; Singla & Goyal, 2006). By providing users with adequate training of the new system, organizations thereby allow themselves an increased possibility of a successful ERP implementation (Dowlatshahi, 2005; Nah et al., 2003). When employees are provided with sufficient training and education for the new system, the risk of resistance that might occur during the implementation of a new system is reduced (Dowlatshahi, 2005; Ramadhana et al., 2016). By offering sufficient training to users and internal team members, organizations can reduce the dependency of consultants and consequently save capital (Dowlatshahi, 2005). Training must cover all parts of the ERP system, operational skills of the new system, with the need of continuous training as well as proper documentation (Huang et al., 2004; Xu et al., 2002; Dezdar & Ainin, 2011).

3.2.13 Technical possibilities
The thirteenth CSF identified within the framework was ‘technical possibilities' (Aloini et al., 2007; Dezdar & Sulaiman, 2009). The selection of ERP packages plays a large part in shaping the success of the implementation project (Motwani, 2005; Saini et al., 2013;
Sommers & Nelson, 2001). The ERP package must be selected wisely as it needs to fit with the organizations’ cultural factors and be comprehensible for everyone involved (Xue et al., 2005. Janson and Subramanian (1996) argued the importance of carefully selecting an ERP system fitting simultaneously together with the organizations' business process and strategy to reduce costs and risks of implementation failure.

3.3 Perspectives on the critical success factors

3.3.1 Project team

‘Project team’ was the first CSF within the framework for implementation of ERP systems and was investigated from a user perspective by Davenport (2000), Loh and Koh (2004) and Snider et al. (2009). They agreed upon the importance of users being involved in the implementation team from the start of the project. Snider et al. (2009) argued that users in their study were likely to solve problems concerning the ERP themselves instead of asking help from consultants who did not hold the soft skills needed to assist. Their study implies that users generally apprehend and value the impact that a knowledgeable project team can have in an ERP system implementation.

From the perspective of the senior managers, only the best suitable participants along with knowledgeable consultants should be a part of the project team. This establishes a higher knowledge foundation for the entire team (Nah et al., 2003; Sambasivan & Fey, 2008; Somers & Nelson, 2001).

Furthermore, project managers emphasize the need of consultants being a part of the team due to restricted time availability of internal employees. Firms employ knowledgeable consultants who have more relevant experience in managing implementation projects rather than internal leaders (Snider et al., 2009; Sumner, 2000).

3.3.2 Top management involvement

‘Top management involvement’ was the second CSF within the framework for implementation of ERP systems and was examined from a user perspective by Snider et al. (2009) and Ramadhana et al. (2016). Users generally welcome the involvement from top management and when high-level personnel support the implementation project (Snider et al., 2009). Ramadhana et al. (2016) argued that users find motivation and can improve their performance if they have adequate support from the top management.
Moreover, managerial support is essential to increase users' perception that the organization is providing adequate attention to the users so that the increased use of ERP systems will occur (Ramadhana et al., 2016). The research by Ramadhana et al. (2016) and Snider et al. (2009) implies that users are generally comprehensible and value the impact that involvement from 'top management' has on the ERP system implementation.

From the perspective of senior managers, top management involvement is critical to provide sufficient resources, prioritizing the project as well as supporting the implementation team by providing them with sufficient time for their responsibilities (Nah et al., 2009; Snider et al., 2009). Moreover, from the perspective of the project manager, it is critical that top management is visible and committed by actively being a part of the implementation project as well as ensuring adequate communication with the users (Chang et al., 2014; Nah et al., 2003; Woo, 2007).

3.3.3 Strategic decision-making

'Strategic decision-making' was the third CSF within the framework for implementation of ERP systems and was examined from a user perspective by Woo (2007) who stated that users believe that senior managers should create a strategic approach to the implementation project. Without an envisioned strategic approach, the users will have difficulties understanding the purpose of the implementation and the advantages of changing the current setting which would lead to users questioning how the changes might affect their position and benefits (Woo, 2007). The study by Woo (2007) implies that users generally understand the value of 'strategic decision-making' for ERP system implementation when it is performed correctly.

According to Adam and O'Doherty (2000), senior managers were pointing out that by having clear goals and objectives as well as a collaboration with experienced ERP implementation professionals can lead to a less time-consuming process for the implementation. Furthermore, project managers emphasize the need of having defined goals and objectives from the start of the project to gain a better understanding of expectations leading to a more fluid implementation project (Plant & Willcocks, 2007).

3.3.4 Communication

'Communication' was the fourth CSF within the framework for implementation of ERP systems and was examined from a user perspective by Woo (2007). The research revealed
that users want to know how the process is proceeding and regularly showed their dissatisfaction when senior managers did not inform and communicated the progress and benefits of the new ERP system. Furthermore, ‘communication' was investigated by Amoako-Gyampah (2004), who identified that within the case company the users’ perceived that the communication strategy was not effective and viewed it different compared to how the managers would perceive it. Umble et al. (2003) argued that users' find it irritating and time-consuming when information is missing or difficult to access. The findings of Amoako-Gyampah (2004), Umble et al. (2003) and Woo (2007) implies that users understand the necessity of efficient communication and appreciate when it is fulfilled throughout the implementation project of a new ERP system.

Senior managers must use communication to explain and motivate their actions. Communication between senior managers and operational employees is essential and must be managed effectively in the implementation project since it helps to facilitate trust that makes lower level users feel motivated and not resist change (Amoako-Gyampah 2004; Chang et al., 2014). Furthermore, the project manager must provide a clear understanding and sharing of the organizational goals by personal communication with lower level employees along with open and honest communication amongst other main parties which affects the success of the implementation project (Sumner, 2000; Wickramasinghe & Gunawardena, 2010).

3.3.5 Project management

‘Project management’ was the fifth CSF within the framework for implementation of ERP systems and was investigated from the user perspective by Chang et al. (2014). Their study indicated that users generally consider project management and project development to be critical for the ERP system implementation to succeed. When conducted properly, users consider that project management in ERP system implementation can increase knowledge sharing and knowledge transfer (Maguire et al., 2010). The research by Chang et al. (2014) and Maguire et al. (2010) implies that users understand the significance of having proper project management when conducting an ERP system implementation.

From the perspective of senior managers, the best possible way of managing a project is to decide upon and reach milestones (Nah et al., 2003). Furthermore, project managers
have the responsibility to review and modify the outline of the project, and the path to a successful implementation project can be directly associated to how experienced and knowledgeable the project manager is (Snider et al., 2009).

3.3.6 Project support

‘Project support’ was the sixth CSF within the framework for implementation of an ERP system and was examined from a user perspective by Snider et al. (2009). Their study presented that users generally consider external consultants to be of additional value as long as they can connect software capabilities with business processes along with knowing the entire software package and appropriate soft skills. The latter was more often perceived to be more critical to achieving more substantial success in the ERP system implementation. Users believe external consultants is critical in the implementation project where it is vital that they assign time as well as transferring knowledge throughout the early stages of the implementation (Maguire et al., 2010). Users consider support regarding financial funding, inspiration and alleviating the team as important (Snider et al., 2009). The findings of Maguire et al. (2010) and Snider et al. (2009) implies that users mostly understand the necessity that project support has for ERP system implementation projects.

From the senior manager perspective, their experiences of previous partnerships with IT vendors is a valuable input to understand how the support and partnership were working previously. Furthermore, by having closer vendor relationships with a defined provision of support, costs associated might be lower than if the supporting role would be poorly considered which might lead to the need of including additional external actors (Laughlin, 1999; Plant & Willcocks, 2007). Furthermore, from the project manager perspective, it is crucial that the organization keep close collaboration with the vendor regarding support, especially organizations that do not have any resident IT since communication regarding development after the implementation might be lacking (Adam & O'Doherty, 2000).

3.3.7 Minimum customization

‘Minimum customization’ was the seventh CSF within the framework for implementation of an ERP system and was examined from a user perspective by Chang et al. (2014). Their study indicated that users do not pay too much attention to customization and do not believe that customization can have an adverse outcome on the success of the ERP system
implementation. Furthermore, in the study of Snider et al. (2009), the interviewed users seemed to be unable to grasp how software issues could be tied together when fixing bugs in the system. The study of Chang et al. (2014) and Snider et al. (2009) thus indicates that users do not perceive customization as a significant success factor for the implementation of an ERP system.

From the senior manager perspective, minimal customization is advantageous since modifications tend to bring high costs and more complexity for the vendor regarding support, maintenance, and upgrades of the system (Chang et al., 2014). Furthermore, project managers usually tend to avoid customization as it generally leads to higher costs and an increased risk of project failure (Sumner, 2001).

3.3.8 Organizational change management
‘Organizational change management was the eighth CSF within the framework for ERP system implementation. However, this CSF has not been examined from a user perspective within the research included in the framework.

From the senior manager perspective, it is critical that the change is supported and frequently briefed to prepare the employees for the imminent change. Communication can reduce the reluctance for change and infuse commitment from the employees which is essential for the implementation of an ERP system to be successful (Chang et al., 2014; Nah et al., 2003; Woo, 2007).

Furthermore, project managers must develop a relationship with the different stakeholders involved in the implementation, and by establishing a prioritization committee to aid scope management, user's reluctance to change can be decreased. This is by increasing transparency in the decision-making process which might lead to conflicts of interest being diminished (Chen et al., 2009).

3.3.9 Business process alignment
‘Business process alignment’ was the ninth CSF within the framework for ERP implementation and was examined from a user perspective by Adam and O'Doherty (2000). They argued that users find it critical that the organizational target of the new ERP system must also meet the business requirements instead of trying to duplicate existing functionality, which was of concern for the users. These findings imply that the
users in their research understood the significance of business process alignment and that this CSF was vital for them in the implementation of the ERP system.

From the senior manager perspective, re-engineering processes would help to avoid the need of customizing the system which can turn out to be costly and complicated and this would also ease the collaboration with the system vendor (Plant & Willcocks, 2007). Furthermore, project managers emphasize that modifying and adapting current business processes to functions of the implemented system contributes to more straightforward and standardized processes that further supports the instances of the ERP system (Chen et al., 2009).

3.3.10 Software testing
‘Software testing’ was the tenth CSF within the framework for ERP system implementation. However, this CSF has not been examined from a user perspective within the research included in the framework.

The senior manager perspective was not elaborated on more than showing that software testing is one of several factors that should be taken into consideration. Furthermore, Snider et al. (2009) claim that project managers generally lack the time as well as knowledge needed and instead employ external consultants for testing the software before going live.

3.3.11 Performance measurement
‘Performance management’ was the eleventh CSF within the framework for ERP system implementation and was discussed from a user perspective by Amoako-Gyampah (2004). In the study, the users were questioning the proposed increased effectiveness of the new ERP system when senior managers assure that productivity measures possibly will be out of focus. Thus, the research participants perceived that performance measurement is not an essential CSF for ERP system implementation.

It is critical that senior manager’s requests data on how the ERP system affects the business performance and regular report as well as project updates can provide senior managers to monitor the development of the implementation project (Nah et al., 2003).
Moreover, performance measurement provides a foundation for the project managers whether the organization can implement a new ERP system and whether the implementation of the new system is likely to be successful (Adam & O’Doherty, 2000).

3.3.12 Education and training

‘Education and training’ was the twelfth CSF within the framework for ERP system implementation and was examined from a user perspective by Maguire et al. (2010). They detected that research participants in their case did not find training to be enough but the same users implied that training is critical to understand the ERP system accurately. The research by Woo (2007) presented the users' perception towards training and concluded that users do not perceive training to be critical to the success of the implementation project. The participants only attended due to training being mandatory where some even did not know why the course was needed. Amoako-Gyampah (2004) and Umble et al. (2003) both had findings where users in their study considered training being a necessity to comprehend the ERP system correctly and to reduce time to understand how the systems are used.

Occasionally, senior managers have the perception that training for the users often is time-consuming as it takes too much time from the regular work assignments. However, research emphasizes the crucially of managers understanding the importance of training and what it provides so that it fits the employees' needs as well as the company's (Woo, 2007). Due to training being time-consuming as well as when needed expertise is lacking in-house. Project managers considered the option of outsourcing training to external consultants with the outcome of having a mix of specialists and internal employees to enable growth of essential technical skills for ERP system implementation projects (Snider et al., 2009; Sumner, 2000).

3.3.13 Technical possibilities

‘Technical possibilities’ was the thirteenth CSF within the framework for ERP implementation and was examined from the user perspective by Chang et al. (2014). The research participants in their study indicated that it unlikely that a software package can have a damaging impact on the success of the implementation. Moreover, technical possibilities from a user perspective were also examined by Amoako-Gyampah (2004), where users' perception of the ERP system was met with lower interest. In comparison to managers who had more knowledge about the technology and its advantages which lead
to users not sharing the same view and thus not understanding the improvement as compared to the current system. Furthermore, the researchers emphasize that users are more interested in the system in the way it directly affects their daily operations than the specific ability to integrate data within the system. The findings from Amoako-Gyampah (2004) and Chang et al. (2014) implies that users do not perceive ‘technical possibilities’ to be important in an ERP system implementation.

From the senior manager perspective, making the right decision and choosing the right applications is essential to accomplish a successful ERP implementation (Chang et al., 2014). The selection of software must meet the organizations’ need for integration as well as reflect the company’s requirement (Amoako-Gyampah, 2004). Furthermore, the project manager plays a significant role in selecting the right software package, and by choosing software that has relating characteristics to current software, organizations can reduce the risk of user resistance and increase the probability of having a successful implementation (Plant & Willcocks, 2007).

3.4 Implementation phases of ERP projects

The 13 CSFs investigated in the framework has carefully been analyzed and grouped into their related phases of an ERP implementation. Markus and Tanis (2000) identified four phases in a typical ERP life cycle which is in line with the stages of the traditional ERP development life cycle.

- Chartering (Pre-implementation): decisions defining the business care and solution constraints
- Project phase (Implementation): getting the system and users up and running
- Shakedown phase (Implementation): stabilizing the system, eliminating bugs and getting to normal operations
- Onward and upward (Post-implementation): Maintaining systems, support to the users, achieving results, upgrading and system extension

3.4.1 Chartering phase

The chartering phase includes critical decisions in forms of financial support to distribute to the ERP implementation project. Key players such as vendors, consultants, and IT specialists are included in the chartering phase as well as key activities in the form of the
initiation of the ERP, evolving a business case, analytical decision-making, carefully ERP selection and project planning and scheduling.

3.4.2 Project phase
The project phase involves system configuration and rollout. Key activities in the project phase include software configuration, system integration, software testing and training and education. The project participants must be knowledgeable and skilled in their respective competency as well as cooperating thoroughly together to meet the organizational goal of the ERP implementation project (Loh & Koh, 2003; Markus & Tanis, 2000).

3.4.3 Shakedown phase
The shakedown phase is the period between going live to when the system is up and running. Key activities in the shakedown phase involved fixing bugs, modification of the system and training. In this phase, reduced productivity or increased disruption is often experienced. Hence, monitoring the system carefully is critical and to make modifications to the system till the bugs are removed (Loh & Koh, 2003; Markus & Tanis, 2000).

3.4.4 Onward and upward
Onward and upward is the last phase and refers to constant improvements of the ERP system and attempting to match the business processes to the business needs of the organization. Key activities in this phase include constant improvements, intense user training and upgrades to the new system (Loh & Koh, 2003; Markus & Tanis, 2000).
<table>
<thead>
<tr>
<th>Phases Authors</th>
<th>Chartering Phase</th>
<th>Project Phase</th>
<th>Shakedown Phase</th>
<th>Onward and Upward</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-implementation</td>
<td>Implementation</td>
<td></td>
<td>Post-implementation</td>
</tr>
<tr>
<td>Bingi et al (1999)</td>
<td>2 1</td>
<td>7 8 10 12 2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Loh and Koh (2003)</td>
<td>1 5 3 4 2</td>
<td>9 7 8 12 10</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Nah et al (2003)</td>
<td>13</td>
<td>2 9 5 8 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somers and Nelson (2001)</td>
<td>13</td>
<td>2 4 9 5 8 12 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somers and Nelson (2004)</td>
<td>2 1 3 4 6 13</td>
<td>2 1 4 6 9 12</td>
<td>6 9 12 2</td>
<td></td>
</tr>
<tr>
<td>Umble et al (2003)</td>
<td>3</td>
<td>2 5 8 12 9</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Roberts and Barrar (1992)</td>
<td>3 2</td>
<td>7 8 12</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Rosario (2000)</td>
<td>4 1 5 3 7 8 10 12</td>
<td></td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Shanks et al (2000)</td>
<td>2 1 3 5 2 1 5 9</td>
<td>2 1 12 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sumner (1999)</td>
<td>1 5 2 4 7 8 12</td>
<td></td>
<td>11</td>
<td></td>
</tr>
</tbody>
</table>

3.5 Critical success factors within ERP implementation phases

Table 5 shows the critical success factors in relation to each phase of an ERP implementation, which has been identified in the literature. In the existing framework by Reitsma and Hilletofth (2017), 54 articles were examined, but only ten articles had emphasized on relating the CSFs to the ERP implementation phases. Table 5 displays the sources and wherein the implementation phase each CSF fits. 10 CSFs were identified from a generic perspective and studied in relation to the steps, and is described below. Due to lack of elaboration regarding the importance of the CSFs within the phases, the three CSFs minimum customization and strategic decision-making and project support, could not be described in detail to why they are important in the phases of an ERP implementation.

**Chartering Phase**

3.5.1 Project team

According to Loh and Koh (2003), having non-committed project participants would negatively influence the ERP implementation within the chartering phase as it is critical to identify and assign appropriate project team members before initiating the implementation. Furthermore, Shanks et al. (2000) identified the need of a balanced project team as necessary throughout the entire implementation project since it must consist of a mix of consultants with ERP expertise as well as internal employees with a good understanding of the business processes.

3.5.2 Top management involvement

For this factor, Loh and Koh (2003), discussed that the allocation of insufficient resources is more likely to occur within this phase. Due to needed understanding of management to not only consider which ERP solution that will deliver best profits but more importantly to understand the amount of capital that needs to be distributed to the project. Furthermore, they pointed out that when the top management provides inadequate funds, the progress and success of implementation will be at risk. Hence they believed that the involvement of the top management is vital in the chartering phase as resources have to be allocated before the initiation of the ERP implementation project. Other researchers emphasized the need of top management be involved in all the steps of the ERP
implementation project as the management needs to have a continuous overview of the project progress and steer the implementation project teams (Bingi et al., 1999; Shanks et al. 2000; Somers & Nelson, 2004).

3.5.3 Technical possibilities
To have a successful ERP implementation project, Somers and Nelson (2001) emphasize that preparation and then making the selection of the ERP system should be conducted at an early stage of the ERP implementation project. Hence, a thorough pilot study of the potential software solutions and their possibilities should be conducted before selecting the ERP software within the chartering phase (Loh & Koh, 2003; Somers & Nelson, 2001).

3.5.4 Project management
Having unstructured project planning can lead to postponements for planned activities. To prevent any unnecessary delays within the project phase, it is critical to making sure that the project is realistically planned earlier in the chartering phase and have a detailed project plan established early in the implementation process (Loh & Koh, 2003; Shanks et al., 2000).

3.5.5 Communication
Loh and Koh (2003) stated that confusion in communication sometimes is inevitable due to language barriers or technical jargon being used, to prevent this type of doubt, clear instructions and messages must be communicated to reduce unnecessary misunderstandings. Thus, this CSF affects the ERP implementation project success within the chartering phase but also within the project phase as it helps to reduce possible resistance from employees (Loh & Koh, 2003; Somers & Nelson, 2004).

Project phase

3.5.6 Business process alignment
According to Loh and Koh (2003), customization such as reconfigurations and modules integration to the software might be compulsory to match the system to the business processes and should occur in the project phase.

Shakedown phase
3.5.7 Software testing
The testing of the software should start to be conducted early in the shakedown phase as the architecture of the ERP system should be set before going live (Loh & Koh, 2003; Nah et al., 2003).

3.5.8 Change management
The process of change management is starting in the shakedown phase and does then proceed to be essential for the rest of the ERP implementation lifecycle (Loh & Koh, 2003).

3.5.9 Education and training
This CSF was found to be most impactful at the shakedown phase of the ERP implementation project due to the need of training for the employees in using the new ERP system and leaving the old ways of working behind (Loh & Koh, 2003). However, according to Somers and Nelson (2004), education and training are critical throughout the entire ERP implementation. Furthermore, their study found that a process of continuous knowledge development for the users regarding the ERP system is crucial to being able to utilize the system to its highest potential in the post-implementation phase.

**Onward and upward phase**

3.5.10 Performance measurement
Due to the changing environment in the shakedown phase, measuring the performance of the system is often a challenge during the transition from the implementation of the system to post-implementation. Milestones and targets are critical to keeping track of the progress, and the performance must be measured against organizational goals (Loh & Koh, 2003).
4 Findings and analysis

Within chapter four, the empirical findings from the interviews with all case companies are presented. General information of the case companies that were interview are presented. The tables within the chapter provides a clarity and shows the case companies perception towards each CSF. The next step in this chapter is the cross-case analysis were the findings of the cases are presented and compared between each other, where both similarities and dissimilarities could be identified.

4.1 Research context

Company A is operating within manufacturing with the focus on the tire industry and is located in Sweden. For the company, strategically, the ERP system was a necessary investment to be able to keep up the continual growth as a company which was communicated by the top management. Four users from different departments within the organization were interviewed were two of them were a part of the implementation project team and two were not. Before implementing the ERP system, the company was working without any system that shared data and communication across the departments of the company. For example, orders were made manually by pen and paper and to check product availability, and the staff had to go from the office to the storage and check manually to confirm customer requests. In the summer of 2014, the top management of the company decided to implement an ERP system. The process from decision to implementation took around six months, and in January 2015 the system went live in the entire organization.

Company B is operating within manufacturing with the focus on the bakery industry and is located in Sweden. For this study, two employees were interviewed, and both were part of the ERP implementation. The company implemented an ERP system in November 2017. Thus, the research participants were able to provide valuable information regarding their perception towards the CSFs and since they were part of the project team could provide a deeper insight and understanding of how they perceived the ERP implementation project at the company.

Company C is operating within the electronic retailing industry and is located in Sweden. For this study, three ERP operational users that were part of the project team contributed
valuable information on how they perceived the critical success factors. The company decided to implement a new ERP system in November 2017.

4.2 Within case analysis

4.2.1 Company A

Users perception towards critical success factors

Table 6 1Shows a description of the user's perception of each CSF in Company A. Based on the findings, the interviews of the four participants were first coded. These codes were then analyzed where the importance of the CSF was first considered and then the best quotes from the interviews that were fitting the individual CSF were determined. Finally, the quotes were used as a base for creating the descriptions that serve as a summarized perception of the participants reasoning of the importance of the CSFs.

Table 6: Case analysis 1

<table>
<thead>
<tr>
<th>Critical success factors</th>
<th>Important (Yes/No)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project team</td>
<td>Yes</td>
<td>It is important to have a shared understanding of the project team with an excellent communication present to ensure that the project progresses in the right place. This is directed by a project leader that should have a deeper understanding of the business processes of the company and to criticize current work procedures. Furthermore, users should take part in the project team to increase the understanding of the project at an earlier stage.</td>
</tr>
<tr>
<td>Top management involvement</td>
<td>Yes</td>
<td>The top management is important if it is a holistic process. The type of involvement depends on the technical knowledge where more knowledgeable managers should be involved on a more detailed level. Lastly, the people involved in the project must be provided support from the management in terms of sufficient time and assistance.</td>
</tr>
</tbody>
</table>

1 For complete table including supporting quotes, see Appendix A: Within-case analysis Company A
<table>
<thead>
<tr>
<th>Topic</th>
<th>Requirement</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic decision-making</td>
<td>Yes</td>
<td>The management should provide a clear direction of what path the company wants to take. This is in the form of a strategy that includes a plan that should be communicated down in the organization to inform the employees about the new system, how this will affect their current routines and processes and make everyone work toward the same goal.</td>
</tr>
<tr>
<td>Communication</td>
<td>Yes</td>
<td>It is important that someone is leading and telling the participants what to do otherwise no one knows what should be done and when it should be done. The scope of the project should be clear from the beginning since it affects the whole organization.</td>
</tr>
<tr>
<td>Project management</td>
<td>Yes</td>
<td>It is important that someone is orchestrating, leading and telling the participants what to do otherwise no one knows what should be done and when it should be done. The scope of the project should be clear from the beginning since it affects the whole organization.</td>
</tr>
<tr>
<td>Project support</td>
<td>Yes</td>
<td>The project support should be in the form of understanding and resources from the vendor to make the process as short as possible without passing on the quality. It is also seen as necessary that the consultants are present for a longer time, keeps an open mind, understands the tasks and the daily work of the employees.</td>
</tr>
<tr>
<td>Minimum customization</td>
<td>Yes</td>
<td>By having a system that is closer to the standard it eases troubleshooting for the system vendor as the standard version should be known by everyone at the vendor support, if more customizations are made there are fewer people at the vendor support that will be able to assist.</td>
</tr>
<tr>
<td>Organizational change</td>
<td>Yes</td>
<td>Change management is important to make the organization remain calm. Otherwise, it might lead to people having discussions with each other as they are not sufficiently informed and might be worried how the change will affect them. By involving employees at an earlier stage, it would be improved. The employees should be informed more often about the progress of the project and visualization the possible result should be shared.</td>
</tr>
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<td></td>
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<tr>
<td>--------------------------------</td>
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<td>-------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Business process alignment</td>
<td>Yes</td>
<td>Business process alignment is vital since more complex organizations require more customization to maintain needed functionality. The adaptation of the processes when possible is necessary to be able to maximize the potential of the system.</td>
</tr>
<tr>
<td>Software testing</td>
<td>Yes</td>
<td>Testing of the software is vital to know that the system and its customizations are operating correctly. Furthermore, the testing allows identification of potential bugs, errors, and flaws at an earlier stage so that it will not affect the operation of the organization after going live. To test the system, users should take part in a step by-step-testing method to view the flow from beginning to end which might result in the identification of errors.</td>
</tr>
<tr>
<td>Performance measurement</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Education and training</td>
<td>Yes</td>
<td>Training is important to develop a better understanding of the system's functions so that when the system is live, the user can perform its tasks at a good pace. Furthermore, the training should be easy to understand so that new users need less time to learn how to use the system.</td>
</tr>
<tr>
<td>Technical possibilities</td>
<td>Yes</td>
<td>As for the technical possibilities that the ERP system brings, technical possibilities is essential as it assists gathering of statistics and analysis as well as providing an overview of how the company is doing so that resources can be distributed to help make improvements in the right areas.</td>
</tr>
</tbody>
</table>

Critical success factors within ERP implementation phases

Table 7 describes a description of the user's perception of were each CSF is considered important in an ERP implementation, for Company A. Based on the findings, the interviews of the four participants were first coded. These codes were then analyzed where the importance of the CSF within the implementation phases was first considered, and then the best quotes from the interviews that were fitting the individual CSF were determined. Finally, the quotes were used as a base for creating the descriptions that serve

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2 For complete table including supporting quotes, see Appendix B: Within-case phases
as a summarized perception of the participants reasoning of the importance of the CSF within the phases of an ERP implementation.

Table 7: Case analysis

<table>
<thead>
<tr>
<th>Critical success factors</th>
<th>Phase/Phases</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project team</td>
<td>Pre-implementation, implementation</td>
<td>The project team is important in the pre-implementation phase and implementation phase</td>
</tr>
<tr>
<td>Top management involvement</td>
<td>All phases</td>
<td>The top management must be involved throughout all phases of the implementation as they need to have an overview of how the project is progressing.</td>
</tr>
<tr>
<td>Strategic decision-making</td>
<td>Pre-implementation, implementation</td>
<td>This CSF is important in the pre-implementation phase and the implementation phase to have a clear view of what is needed to do and when it is needed.</td>
</tr>
<tr>
<td>Communication</td>
<td>All phases</td>
<td>Communication must be clear throughout all phases of the ERP implementation</td>
</tr>
<tr>
<td>Project management</td>
<td>All phases</td>
<td>Project management is important throughout the entire project as goals and plans might be changing throughout the project</td>
</tr>
<tr>
<td>Project support</td>
<td>Pre-implementation, implementation</td>
<td>Project support is especially important in the implementation phase, and the post-implementation phase, when issues might occur that needs to be solved and support in terms of consultants needs to be available.</td>
</tr>
<tr>
<td>Minimum customization</td>
<td>Pre-implementation</td>
<td>In the early stages of the project to identify the conditions and what customizations that the system needs to work correctly.</td>
</tr>
<tr>
<td>Organizational change management</td>
<td>All phases</td>
<td>Change management is important throughout the entire project. Employees might be afraid of the change, and there might be resistance to new updates.</td>
</tr>
<tr>
<td>Business process alignment</td>
<td>Implementation, post-implementation</td>
<td>Business process alignment is important in the implementation phase and the post-implementation phase as some processes must be developed even after go-live due to new updates to the system</td>
</tr>
</tbody>
</table>
Software testing | Implementation, post-implementation | Software testing is important just before going live but also in the post-implementation phase. The testing must take place when the system is almost done to ensure that everything is working appropriately and in the post-implementation phase, the testing must take place to ensure that the new processes and updates are working as they should.

Performance measurement | Implementation, post-implementation | Performance measurement is important in the implementation and post-implementation phase.

Education and training | All phases | Training and education of the system are important in all phases, especially in firms lacking an IT department and only have insufficient previous experience.

Technical possibilities | Pre-implementation | Technical possibilities are essential in the pre-implementation phase. Before implementing the system, the organization must be aware of the technical possibilities the system can provide and how they are matched with the business processes.

4.2.2 Company B

Users perception towards critical success factors

Table 8 shows a description of the user’s perception of each CSF in Company B. Based on the findings, the interviews of the two participants were first coded. These codes were then analyzed where the importance of the CSF was first considered and then the best quotes from the interviews that were fitting the individual CSF were determined. Finally, the quotes were used as a base for creating the descriptions that serve as a summarized perception of the participants reasoning of the importance of the CSFs.

Table 8: Case-analysis 1

<table>
<thead>
<tr>
<th>Critical success factors</th>
<th>Important (Yes/No)</th>
<th>Description</th>
</tr>
</thead>
</table>

3 For complete table including supporting quotes, see Appendix C: Within-case analysis Company B
| **Project team** | Yes | It is important to have people that have an understanding of the business and makes sure that everything in the system is working. These people should also have previous experience from other successful projects to provide confidence to the team. Furthermore, a project leader is vital to make sure that the project is going in the right direction, making sure that the time plan of the project is kept and that there are sufficient resources and budget for the project. |
| **Top management involvement** | Yes | The top management is vital since it is them that holds the knowledge of how the organization is working, in what direction the company wants to go and maintain a holistic perspective of the implementation project and its goal. The people in the organization needs to know that support will be provided. Furthermore, there should be transparency between the top management and the users, so that questions from users can be answered. Lastly, team participants should have support in terms of full-time dedication to the project and be relieved from daily tasks. |
| **Strategic decision-making** | Yes | It is crucial to have a clear strategy, the entire organization that will operate the ERP system has to understand. The management should have a good plan with a reasonable timetable, sufficient resources, follow critical milestones and only proceed when those are solved. Furthermore, there should be a holistic overview of what solution is provided for the project team and managers. This overview should be visualized to show how solutions are integrated and how they will help the business proceed. |
| **Communication** | Yes | Communication is vital to creating an understanding of the processes from beginning to end in the organization. It helps to create an understanding of cross-functional processes among the teams in the organization. The communication should cover the entire organization to create an understanding of what is going on and why. This would make sure that more employees are taking part. |
| **Project management** | Yes | It is crucial that there is someone that is managing the project and makes sure that the project is progressing according to plan. This should be in the form of a project manager who should have a holistic view, coordination as well as making sure that there are sufficient resources and budget. |
Furthermore, there should be a clear time plan that includes milestones to ensure that the team knows what is needed and what should be done.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Project support</td>
<td>Yes</td>
<td>There should be an emphasis on using intern resources in the form of for example IT-staff to provide support instead of having a big number of consultants. By having more consultants, there is a risk that fewer know the business leading to the consultants needing to have explanations of the business of the company. This would also increase the risk of it taking a longer time to start and things going wrong.</td>
</tr>
<tr>
<td>Minimum customization</td>
<td>Yes</td>
<td>When customizing the system, customizations might bring issues when applying updates. However, even if a standard solution would be more straightforward, the system must fit the business and its requirements which would require customizations.</td>
</tr>
<tr>
<td>Organizational change management</td>
<td>Yes</td>
<td>Change management is essential so that the employees understand the reasons for the change and why is the organization needs it. This is especially important since some employees might not see any improvements in their work and then they need to get an understanding of how the changes will help the organization as a whole. As employees might be uncertain and afraid of the change, the communication of the changes would help maintain the motivation of the employees and avoid resistance and frustration.</td>
</tr>
<tr>
<td>Business process alignment</td>
<td>Yes</td>
<td>It is essential to make sure that the system and the business processes go hand in hand. Otherwise, it would lead to significant problems after going live. There might be workarounds that would work, but if those are not supported, there might be a risk of needing manual workarounds.</td>
</tr>
<tr>
<td>Software testing</td>
<td>Yes</td>
<td>Software testing is important to check if the system is operating correctly and that the data within the system is good. By testing, issues that could affect the business operation can be identified. The testing should be performed by everyone in the organization where the testing should be covering the processes of the company using real-life scenarios.</td>
</tr>
</tbody>
</table>
It is important to decide on what KPIs to be measured and to have experienced people in the team that understands the progress so that things are done in the right order and in the right way.

Training is important to develop an understanding of the system and its processes so that the users can identify errors and correct these. It is good to conduct training early in the process and go through how specific tasks will be handled in the system for the users to be more confident operating the system.

The ERP system should be gone through using scenarios to see how the functions correspond to the business of the company and what the gaps of the specific software are to understand what workarounds that might be needed.

Critical success factors within ERP implementation phases

Table 9 shows a description of the user's perception of were each CSF is considered important in an ERP implementation, for Company B. Based on the findings, the interviews of the two participants were first coded. These codes were then analyzed where the importance of the CSF within the implementation phases was first considered and then the best quotes from the interviews that were fitting the individual CSF was determined. Finally, the quotes were used as a base for creating the descriptions that serve as a summarized perception of the participants reasoning of the importance of the CSF within the phases of an ERP implementation.

Table 9: Case-analysis 1

<table>
<thead>
<tr>
<th>Critical success factors</th>
<th>Phase/Phases</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project team</td>
<td>Implementation, Post-</td>
<td>The project team is important in the implementation and post-</td>
</tr>
<tr>
<td></td>
<td>implementation</td>
<td>implementation phase, wherein the post-implementation phase potential</td>
</tr>
<tr>
<td></td>
<td></td>
<td>issues have to be fixed by the team.</td>
</tr>
</tbody>
</table>

For complete table including supporting quotes, see Appendix D: Within-case analysis phases.
<table>
<thead>
<tr>
<th>Top management involvement</th>
<th>Pre-implementation, implementation</th>
<th>Top management involvement is important in the pre-implementation, and implementation phase as the management must be involved and take critical decisions.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic decision-making</td>
<td>Pre-implementation</td>
<td>Strategic decision-making is essential in the pre-implementation phase as it is in this phase important implementation strategies must be discussed and planned.</td>
</tr>
<tr>
<td>Communication</td>
<td>All phases</td>
<td>Communication is vital in all phases of the implementation. In the pre-implementation phase, it is essential to inform the employees about what is going on. In the implementation phase, it is essential to keep everyone updated sharing valuable information. Lastly, it is important in the post-implementation where learnings and follow-ups on the project can be shared.</td>
</tr>
<tr>
<td>Project management</td>
<td>Pre-implementation, implementation</td>
<td>Project management is important in the pre-implementation and implementation phases.</td>
</tr>
<tr>
<td>Project support</td>
<td>Implementation</td>
<td>Project support is important in the implementation phase to have support present that can assist in critical moments.</td>
</tr>
<tr>
<td>Minimum customization</td>
<td>Pre-implementation</td>
<td>Minimum customization is important in the pre-implementation phase.</td>
</tr>
<tr>
<td>Organizational change management</td>
<td>All phases</td>
<td>Change management is essential in all phases of the implementation. In the pre-implementation, it is essential since justification of why the new ERP is needed should be shared whereas in the rest of the project there should be continuous follow-ups to involve the employees.</td>
</tr>
<tr>
<td>Business process alignment</td>
<td>Pre-implementation</td>
<td>Business process alignment is essential in the pre-implementation phase as it is in this phase evaluation of current processes and how they can be matched with the system is taking place.</td>
</tr>
<tr>
<td>Software testing</td>
<td>Pre-implementation, implementation</td>
<td>Software testing is important in the pre-implementation and implementation phase. In the implementation phase, it is important to test all the processes and check, so they function correctly before going live.</td>
</tr>
</tbody>
</table>
Performance measurement | Implementation, Post-implementation | Performance measurement is important in the implementation and post-implementation phases. In the post-implementation phase, it is important to measure the performance and compare it to the starting point.

Education and training | Implementation, Post-implementation | Education and training are important in the implementation and post-implementation phases. In the post-implementation, it is important to follow up and provide additional training if needed, especially when there are new updates.

Technical possibilities | Pre-implementation | Technical possibilities are important in the pre-implementation phase.

4.2.3 Company C

Users perception towards critical success factors

Table 10\(^5\) shows a description of the user's perception of each CSF in Company C. Based on the findings, the interviews of the three participants were first coded. These codes were then analyzed where the importance of the CSF was first considered, and then the best quotes from the interviews that were fitting the individual CSF was determined. Finally, the quotes were used as a base for creating the descriptions that serve as a summarized perception of the participants reasoning of the importance of the CSFs.

Table 10: Case-analysis 1

<table>
<thead>
<tr>
<th>Critical success factors</th>
<th>Important (Yes/No)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project team</td>
<td>Yes</td>
<td>For an ERP implementation to succeed, the project team must consist of people who have been involved in similar projects, and that knows what is needed. Furthermore, the project team must include at least one representative from each department within the organization, have a common understanding and be synchronized where everyone is working towards the same goals. A project leader who has more knowledge can be important since it is a person that are leading the project as well as being a person that the users can trust.</td>
</tr>
</tbody>
</table>

\(^5\) For complete table including supporting quotes, see Appendix E: Within-case analysis Company C

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<table>
<thead>
<tr>
<th>Topic</th>
<th>Yes/No</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top management involvement</td>
<td>Yes</td>
<td>The top management must be involved in terms of taking decisions on the critical parts and must understand the complexity of an ERP project and that it is something that takes time. Furthermore, the top management must depose sufficient resources to the project and have an understanding that the project might encounter problems during the implementation.</td>
</tr>
<tr>
<td>Strategic decision-making</td>
<td>Yes</td>
<td>A strategy with clear goals and a timeline can be of considerable assistance for the employees. Since a clear strategy and business plan enables the employees to see the benefits of the project, especially when some employees might not have experienced an ERP implementation. The timeline must include a go-live date as well as a justification of the project where the benefits of the new system will be explained.</td>
</tr>
<tr>
<td>Communication</td>
<td>Yes</td>
<td>Communication is important for the employees to create an understanding and to feel involved in the project. By communicating in a shared forum, everyone can access the information. Information on how the project is progressing should also be communicated down to the organization throughout the entire project which would also aid the feeling of participation among the users.</td>
</tr>
<tr>
<td>Project management</td>
<td>Yes</td>
<td>Project management is critical when implementing an ERP system as someone is leading the project and knows what should be done. A strong sense of prioritization is needed since the most critical processes have to be assessed to understand what is most important.</td>
</tr>
<tr>
<td>Project support</td>
<td>Yes</td>
<td>The project should be supported in terms of having experienced and knowledgeable consultants available. ERP implementations are complicated projects, and the consultants must be able to provide solutions and have an ability to solve issues swiftly. It is also important that the consultants are located close to the organization and speak the same language.</td>
</tr>
<tr>
<td>Minimum customization</td>
<td>Yes</td>
<td>Too much customization of the ERP system can result in issues in the long term as the advanced unique solutions that have been customized have to be managed. Furthermore, the vendor might not be familiar with the customizations compared to the standard solution which in comparison can lead to swifter aid.</td>
</tr>
<tr>
<td>Area</td>
<td>Required</td>
<td>Details</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>----------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Organizational change management</td>
<td>Yes</td>
<td>Change management is important to reduce resistance and to make the employees understand the benefits of the new system for the entire organization. The employees need to be informed regarding the change and why it is needed. The top management must inform the users about the change and explain how it will affect them. This should be conducted early in the implementation as some employees might require more time to process the change.</td>
</tr>
<tr>
<td>Business process alignment</td>
<td>Yes</td>
<td>Matching the business processes with the ERP system is crucial as it enables the system to manage everything the company needs so that essential functionality is kept. The processes must be documented as it facilitates clarity and decreases the risk of things going missing. It is important to understand that the system must be selected with the business processes in mind. However, the organization must also customize its processes to fit the ERP system.</td>
</tr>
<tr>
<td>Software testing</td>
<td>Yes</td>
<td>Software testing is vital to assure a safe ERP solution and to avoid unpleasant surprises when the system is live. Testing the system is important to have less complexity after going live. By running correct testing, it allows the organization to identify possible errors, and it can make the user more comfortable with the system. The tests have to be conducted in a detailed step-by-step manner, and the use of scenarios is a good way of doing this.</td>
</tr>
<tr>
<td>Performance measurement</td>
<td>Yes</td>
<td>Performance must be measured for the daily work to function as it should. It is important to measure the performance to see if the organization can manage its processes. It is essential that tasks do not take too long time which means that functions that are taking a long time have to be streamlined as it otherwise might disrupt the daily operations.</td>
</tr>
<tr>
<td>Education and training</td>
<td>Yes</td>
<td>Training and education are essential to reduce insecurity and to make the user feel more comfortable operating the system. System training allows the user to understand how the system functions and reduce dependability once the system is live. Moreover, training allows the user to start working independently when the system is rolled out. It is essential to have an understanding of the worries some users might feel and to provide step-by-step training would make the training more straightforward to understand.</td>
</tr>
</tbody>
</table>
The technical possibilities an ERP system can provide is important to develop processes that require system support and to increase the efficiency. The technical possibilities must be on the same level as the business processes of the company.

Critical success factors within ERP implementation phases

Table 11 shows a description of the user's perception of where each CSF is considered important in an ERP implementation, for Company C. Based on the findings, the interviews of the three participants were first coded. These codes were then analyzed where the importance of the CSF within the implementation phases was first considered and then the best quotes from the interviews that were fitting the individual CSF were determined. Finally, the quotes were used as a base for creating the descriptions that serve as a summarized perception of the participants reasoning of the importance of the CSF within the phases of an ERP implementation.

<table>
<thead>
<tr>
<th>Critical success factors</th>
<th>Phase/Phases</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project team</td>
<td>All phases</td>
<td>The project team is important throughout the entire implementation project. In pre-implementation phase, the project team will work a lot with the pilot study and in post-implementation phase as well as it might come up some critical decisions to manage.</td>
</tr>
<tr>
<td>Top management involvement</td>
<td>All phases</td>
<td>The top management should be involved throughout the entire ERP implementation project as they must have an understanding for how the project is progressing and also be there to help the project team when the big decisions are taken.</td>
</tr>
<tr>
<td>Strategic decision-making</td>
<td>Pre-implementation</td>
<td>Before the implementation for the entire organization to have an understanding of the projected goals.</td>
</tr>
<tr>
<td>Communication</td>
<td>All phases</td>
<td>Communication is highly crucial throughout the entire communication as it enables visibility and decreases confusion. In the post-implementation, the operational user might feel a shock, especially if the...</td>
</tr>
</tbody>
</table>

For complete table including supporting quotes, see Appendix F: Within-case phases
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project management</strong></td>
<td>Pre-implementation</td>
<td>During the implementation when the organization must evaluate which parts of the project that needs more work, which parts must be prioritized.</td>
</tr>
<tr>
<td><strong>Project support</strong></td>
<td>All phases</td>
<td>Project support is essential throughout the entire project as knowledgeable consultants can aid during the go-live period and also be there to help the operational users.</td>
</tr>
<tr>
<td><strong>Minimum customization</strong></td>
<td>Pre-implementation</td>
<td>Minimum customization is important in the pre-implementation phase when the pilot study is completed. Customizations must be determined early in the project to eliminate difficulties later.</td>
</tr>
<tr>
<td><strong>Organizational change management</strong></td>
<td>All phases</td>
<td>Change management must be managed throughout the entire project as the employees must that they are participating and feel involved. The employees learn at a different speed and to minimize confusion or resistance, change management must be available until everyone feels safe with the change.</td>
</tr>
<tr>
<td><strong>Business process alignment</strong></td>
<td>Implementation</td>
<td>Business process alignment is important in the implementation phase as well as in the post-implementation phase. It is first during the implementation the processes in the system are shown and can see how they are responding in practice, and post-implementation is also important because it is in this phase the organization can see if the business processes are matching with the system and can modify if needed.</td>
</tr>
<tr>
<td><strong>Software testing</strong></td>
<td>Implementation, post-implementation</td>
<td>Software testing is important in the implementation phase and the post-implementation phase. It is first in the implementation phase, before going live that the testing can take place as the organization can see how the system is reacting when operating. In the post-implementation phase, testing of the system is important when new updates must be tested.</td>
</tr>
<tr>
<td><strong>Performance measurement</strong></td>
<td>Implementation, post-implementation</td>
<td>In the implementation phase as well as in the post-implementation phase is when the organization can first measure its performances.</td>
</tr>
</tbody>
</table>
Education and training

<table>
<thead>
<tr>
<th>Education and training</th>
<th>Implementation, post-implementation</th>
<th>In the implementation phase as well as in the post-implementation phase. If training is provided to early will only lead to confusion and people will forget it. It must be conducted just before go-live</th>
</tr>
</thead>
</table>

Technical possibilities

<table>
<thead>
<tr>
<th>Technical possibilities</th>
<th>Pre-implementation</th>
<th>In the pre-implementation phase, as the technical possibilities the system can offer must be examined when choosing the ERP. Moreover, the technical possibilities must as well be developed continuously to remain competitive</th>
</tr>
</thead>
</table>

4.3 Cross-case analysis

4.3.1 Users perception towards critical success factors

Project team

The ‘Project team’ in an ERP implementation was discovered to be important in all the cases. All cases revealed that it is essential to have a project leader. Company B and C further discussed that the project leader should be leading the project in the right direction. Another shared perception was Company B and C pointed out that there should be participants within the group that have been part of previous projects.

There were also some specific perceptions pointed out in the cases, where Company A discussed that it is essential to have a shared understanding of the project team. The employees that will become users of the system should be a part of the project to create an understanding of the system at an early stage and that the project leader should have a deeper understanding of the business processes of the company and be able to criticize current work procedures.

Company B pointed out that the people involved in the project should have an understanding of the business and make sure that everything is working. Company C pointed out that there should be a common understanding and synchronization where everyone is working toward the same goals. Their project team should also consist of at least one representative within the organization. They also argued that the project leader should be someone that the users can trust.
Top management involvement

‘Top management involvement’ in an ERP implementation was found to be significant across all the cases. Company A and B found that the top management should provide the time needed for the project.

On the other hand, differences between the perceptions between the cases were found. Company A pointed out that involvement from the top management is vital if it is a holistic process and the type of involvement depends on the technical knowledge of the managers, where more knowledgeable managers should be more involved on a detailed level.

Company B emphasized that the top management was seen as the ones knowing how the organization is working, in what direction the organization wants to go and that they maintain a holistic perspective of the project and its goal. They also discussed the need for transparency between the top management and the users to justify the ERP implementation and provide answers to questions of the users. Lastly, they found that it the team participants should be relieved from their daily tasks.

Company C explained that the top management must be involved in terms of taking critical decisions and have an understanding of the complexity that an ERP project might bring and that it takes time. Furthermore, the top management must depose sufficient resources to the project and have an understanding that the project might encounter problems during the implementation.

Strategic decision-making

‘Strategic decision-making’ was found to be important in all the cases. Company B and C had similar perceptions where they pointed out that there must be a clear strategy. On the other hand, Company A pointed out that there should be a clear direction for the path that the company wants to take. Furthermore, they explained that there should be a strategy with a plan that is communicated in the organization to inform the employees about the new system, how this will affect their current routines and processes and make everyone work toward the same goal.
Company B pointed out that the entire organization that will operate the ERP system has to understand. The management should have a good plan with a reasonable timetable, sufficient resources, follow critical milestones and only proceed when those are solved. This should be shown using holistic overview of the provided solution for the project team and the managers, where it should be visualized and show how the solutions are integrated and how they will help the business proceed.

Company C argued that there should be a strategy with clear goals and a timeline which can be of substantial assistance for the employees. So by having a clear strategy and business plan it enables the employees to see the benefits of the project, especially when some employees might not have experienced an ERP implementation. Lastly, they mentioned that there should be a timeline that includes a go-live date as well as a justification of the project where the benefits of the new system will be explained.

Communication
The CSF ‘Communication’ was seen to be important in all the cases. Company A and B pointed out that the communication should cover the entire organization. Company A and C found that communication would make more people feel involved in the project.

The companies also provided different perceptions, where Company A discussed that communication would make people understand each other. They also argued that if there is something to communicate it should be communicated to avoid rumors and own interpretations among employees outside the project team. Lastly, they found that it is critical to communicate within the whole chain of the organization since people affect each other within the chain.

Company B pointed out that communication would create an understanding of the processes from beginning to end in the organization and that it would help to create an understanding of cross-functional processes within the organization among the teams in the organization. They also discussed that the communication would make sure that more employees are taking part. Company C found that communication is vital for the employees to create an understanding. They further pointed out that by communicating in a shared forum, the information can be accessed by everyone. Lastly, it was emphasized that information on how the project is progressing should be communicated down in the
organization throughout the entire project which would aid the feeling of participation among the users.

Project management
‘Project management’ was significant in all the cases. Company A and B found that project management is essential so that the participants know what should be done.

Besides the shared perception there were some different perceptions of the cases, where Company A explained that the scope of the project should be clear from the beginning since it affects the whole organization.

Company B discussed the need for having a clear time plan that includes milestones to ensure that the team knows what is needed. Furthermore, it was seen to be essential to make sure that the project is going in the right direction, that the time plan of the project is kept and that there are sufficient resources and budget for the project. Company C emphasized that project management is important when implementing an ERP system as the project has to be in order with energy being spent on relevant parts. It was also found that a strong sense of prioritization is needed since the most critical processes have to be assessed to understand what is most important.

Project support
‘Project support’ was found to be of importance all case companies, where the findings of Company A and C pointed out the need of having consultants supporting the team.

Some of the perceptions of the companies were specific for the cases, where Company A explained that support should be in the form of understanding and resources from the vendor to ensure a swift process without passing on the quality. They further discussed that it is crucial to have consultants present for a long time that is keeping an open mind and understand the tasks and daily operations work of the employees. Company B pointed out that there should be more emphasis of using IT-staff for support than having a larger amount of consultants as this would ensure having more people knowing the business in the project and lower the risk of the project taking too long and things going wrong. Company C further discussed the importance of having the consultants that must be able
to provide solutions and have an ability to solve issues swiftly. The consultants should also be located close to the company and speak the same language.

Minimum customization
The ‘minimum customization' CSF was seen to be significant across all the cases. In Company A and C it was found that by having fewer customizations, it would ease the support for the software vendors.

Some perceptions were specific for the cases, where Company B was different from the other cases where they discussed that customizations might bring issues for updates of the system. Company C pointed out that too much customization can lead to long-term issues as customized unique solutions have to be managed.

Organizational change management
‘Organizational change management' was significant in all the cases. Company B pointed out that change management is vital to decrease resistance as well as communicating the change which might help to maintain the motivation of the employees. Company C argued that change management is crucial as its aid to reduce resistance and to make the employees understand the benefits of the new system. Both companies also discussed that the employees need to know why the change is needed.

Some of the perceptions were contrasted among the cases, where Company A argued that is crucial that the organization remain calm as it otherwise might lead to people discussing among each other as they are not informed and that they might be worried about how the change will affect them. Furthermore, the information regarding how the project is progressing was seen to be essential for a smooth change including a visualization of the possible results the new ERP system will provide. Company C mentioned that top management must inform the employees about the change and explain to the users how it might affect them at an early stage for the employees to process the change.

Business process alignment
‘Business process alignment' was revealed to be important in all the cases. In Company A it was found to be important to match the business processes of the company to maximize the potential of the ERP system, whereas Company C found it essential to match the processes with the ERP system as it enables the system to manage everything
the company needs so that important functionality is maintained. Furthermore, Company B and C pointed out that the business processes and the system should go hand in hand and the selection of the system should be made with the business processes in mind.

On the other hand, some perceptions that were unique within the cases were found, were Company A pointed out that business process alignment is vital since more complex organizations require more customizations to maintain needed functionality. Company C argued that the processes should also be documented since it provides clarity and lowers the risk of missing things. Lastly, the organization must also customize its processes to fit the ERP system.

Software testing
The ‘software testing’ CSF was significant in all the cases, where it was pointed out that the system must be tested adequately. Company A and C further discussed that the testing is essential before going live as it allows identification of errors in the system. Furthermore, Company C discussed the importance of testing the system in a detailed manner. Company A and B pointed out that testing would show if the system is operating correctly. Company B and C argued that the testing should be conducted using scenario testing. Company A and C also found that the testing should be conducted step-by-step.

The companies also provided unique perceptions for their cases, where Company A argued that the users should take part in the testing. Company B discussed that testing could help to identify issues that could affect the business operation. Furthermore, it was found to be important that everyone in the organization should take part in testing of the system.

Performance measurement
‘Performance measurement’ was important in Company B and C. No shared perception of the reasoning of the CSF could be established. However, Company B pointed out that it is important to decide on what KPI’s that should be measured. Company C addressed that performance must be measured to make sure that daily functions work and to see if the organization can manage the processes. It was seen to be important that the tasks do not take too long and if they do, they should be streamlined as it otherwise might disrupt the daily operations.
Education and training

The CSF ‘Education and training’ were seen to be important in all the cases. It was found that Company B and C believed training of the ERP system to be critical as it allows users to be more comfortable with the system.

The cases pointed out perceptions that were unique, where Company A pointed out that training is essential to develop a better understanding of the system's functions so that the user can perform its tasks at a good pace when the system is live. It was also explained that the training should be easy to understand so that new users need less time to learn how to use the system. Company B argued that training is vital to develop an understanding of the system and its processes so that the users can identify errors and correct them. The case also found that the training should be conducted early in the process, where specific tasks should be gone through. Company C explained that training would allow the users to work independently when the system is rolled out. They further discussed that by conducting the training step-by-step, it would make it easier for the users to understand.

Technical possibilities

‘Technical possibilities' was found to be important in all the cases. Company B argued that the ERP system must go through scenarios to see how the functions correspond to the business, whereas Company C pointed out that it is essential that the technical possibilities of the system are on the same level as the business processes.

There were also some perceptions that did not match across the cases, where Company A discussed that the possibilities the system provided for a gathering of statistics and analysis as well as the provision of how the company is doing so that resources can be distributed to help make improvements in the right areas. Company B explained that gaps in the software must be identified to understand what possible workarounds that might be needed. Company C argued that the possibilities that the ERP system can provide are vital to develop processes that require support from the system and to increase the efficiency.
4.3.2 Critical success factors in relation to implementation phases

Table 12 reveals a shared perception from the case companies and shows the importance of each CSF within the phases of an ERP implementation. As seen in the table, ‘Top management involvement,’ ‘Communication' and ‘Organizational change management' were seen to be important throughout the entire implementation project, which was agreed by all case companies. Moreover, all case companies shared the perception that ‘Technical possibilities' and ‘Minimum customization' to be most important in the pre-implementation phase.

Table 12: Cross-case-ERP implementation phases 1

<table>
<thead>
<tr>
<th>Critical success factors</th>
<th>Company A</th>
<th>Company B</th>
<th>Company C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project team</td>
<td>Pre-implementation, implementation</td>
<td>All phases</td>
<td>All phases</td>
</tr>
<tr>
<td>Top management involvement</td>
<td>All phases</td>
<td>All phases</td>
<td>All phases</td>
</tr>
<tr>
<td>Strategic decision-making</td>
<td>Pre-implementation, implementation</td>
<td>Pre-implementation</td>
<td>Pre-implementation</td>
</tr>
<tr>
<td>Communication</td>
<td>All phases</td>
<td>All phases</td>
<td>All phases</td>
</tr>
<tr>
<td>Project management</td>
<td>All phases</td>
<td>All phases</td>
<td>Pre-implementation</td>
</tr>
<tr>
<td>Project support</td>
<td>Pre-implementation, implementation</td>
<td>All phases</td>
<td>All phases</td>
</tr>
<tr>
<td>Minimum customization</td>
<td>Pre-implementation</td>
<td>Pre-implementation</td>
<td>Pre-implementation</td>
</tr>
<tr>
<td>Organizational change management</td>
<td>All phases</td>
<td>All phases</td>
<td>All phases</td>
</tr>
<tr>
<td>Business process alignment</td>
<td>Implementation, post-implementation</td>
<td>Pre-implementation</td>
<td>Implementation</td>
</tr>
<tr>
<td>Software testing</td>
<td>Implementation, post-implementation</td>
<td>Pre-implementation, implementation</td>
<td>Implementation, post-implementation</td>
</tr>
<tr>
<td>Performance measurement</td>
<td>Implementation, post-implementation</td>
<td>Implementation, Post-implementation</td>
<td>Implementation, post-implementation</td>
</tr>
<tr>
<td>Education and training</td>
<td>All phases</td>
<td>Implementation, Post-implementation</td>
<td>Implementation, post-implementation</td>
</tr>
<tr>
<td>Technical possibilities</td>
<td>Pre-implementation</td>
<td>Pre-implementation</td>
<td>Pre-implementation</td>
</tr>
</tbody>
</table>
Project team
Company B and C agreed upon the importance of having the project team active throughout all phases of the implementation and both cases especially pointed out that the project team is essential in the post-implementation phase due to potential issues that might arise that has to be managed by the project team members.

Top management involvement
All the case companies agreed that involvement from top management is important to be present in all phases of the ERP implementation. Company A and B found top management involvement as especially crucial in the early stages to ensure a good start of the project but believed that the management must be involved throughout all phases of the implementation. Company B and C pointed out that the top management must be involved to understand the project and which critical decisions that have to be made. Moreover, Company A and C agreed upon the importance of involvement from the management by having a holistic overview and understanding of how the project is progressing.

Strategic decision-making
All cases approved that the strategy of the project must be clear and done in the pre-implementation phase. Company A and C believed strategic decision-making must be early in the project to provide a good understanding of why the new system is needed to everyone in the organization.

Communication
Each case company agreed upon the importance of communication is available throughout all phases of an ERP implementation. Company B and C pointed out that communication in the pre-implementation phase enables that information will be available for everyone and moreover agreed that communication in the post-implementation phase is critical due to new updates to the system might occur and follow-ups are needed. Company C further argued that communication in the post-implementation phase is essential since the system might not be fully completed after going live.
Project management
Company A and B shared the same perception regarding project management and believed that project management must be available throughout all phases of the ERP implementation. Company C found project management as important during the implementation phase where the organization must evaluate which functions that need modification and which parts that need to be prioritized.

Project support
Company B and C agreed that the project must be assisted throughout the entire ERP implementation as knowledgeable consultants have to be available to support the users in critical moments.

Minimum customization
All case company believed that customization the ERP system must be made in the pre-implementation phase and company A and C believed it to be important in the early stages due to reduce difficulties later in the project and for the system to work correctly.

Organizational change management
Change management was found to be important throughout all phases of an ERP implementation for all our case companies. Company A and B discussed that change management must be available throughout the entire project due to new updates to the system and to reduce resistance. Company C believed that change management must be present throughout the entire project as users learn and adapt in different speed and must therefore be available until everyone feels safe with the change.

Business process alignment
Company A and C found business process alignment to be critical in the implementation and the post-implementation. Company A found business process alignment as critical in the post-implementation phase as some processes must be developed after go-live due to new updates to the system. Company C found business process alignment as critical in the implementation phase as the processes in the system are shown and can reveal how they are responding to practice. Company C found business process alignment as critical in the post-implementation as organizations can see how the business processes are matching with the system and modify if needed.
In contrast to the other cases, company B found business process alignment as important in the pre-implementation phase as current processes can be evaluated and matched with the elected system.

Software testing
All case companies found software testing as important in the implementation phase as it allows the implementing firm to ensure that the ERP system is working accordingly before going live. Moreover, company A and B believed that software testing must also take place in the post-implementation phase due to new system updates. Company C believed that software testing was important in the implementation phase, where it was important that all processes were tested to check that they are working correctly before going live.

Performance measurement
All case company believed performance measurement to be most important in post-implementation phase. Company A believed that first after a year the performance of the system could be measured whereas company B believed that performance measurement could be conducted when the system is functioning. Company C had similar perception towards performance measurement and believed that it is first when the system is operating correctly that the organization can measure its performances.

Education and training
Company B and C believed education and training to be most important in the implementation phase as well as in the post-implementation phase. Company A found training as essential in all phases of implementation as it can reduce confusion amongst the users. Moreover, Company B found training in post-implementation phase as it is important to follow up and provide more training when new updates to the system are released. Company C believed training as important just before go-live. If the firm provides training to early in the project might increase the risk of users forgetting what they were learned.

Technical possibilities
All the case companies found technical possibilities as most important in the pre-implementation phase. Company A and C pointed out that the technical possibilities must be evaluated in the early stage as the organization must be aware of the possibilities the
system can provide when selecting the ERP. Company C believed that the technical possibilities of the system are in need of being developed continuously. Company A argued that the technical possibilities of the system need to be known and examine in the pre-implementation phase and the implementing firm must know how they are matched with the company to get a clearer view of which system to choose.
5 Discussion

This chapter concentrates on a discussion by linking the cross-case analysis with the literature.

5.1 User perception towards critical success factors

Project team

When investigating the first CSF within the framework by Reitsma and Hilletofth (2017), the ‘Project team’ in an ERP implementation was discovered to be important in all case companies. The participants shared the perception that the project team must consist of people from different departments, working towards the same goals. This is in line with the literature, where Somers and Nelson (2001), Sumner (2000) and Woo (2007) argued that the project team must be composed into a cross-functional group working together.

Company B and C pointed out that there should be participants within the group that have been part of previous successful projects. This would imply that these participants are seen as the best available members of project team. This is in line with the findings of Nah et al. (2003), Sambasivan and Frey (2008) and Somers and Nelson (2001), who pointed out that the project team should only include the best suitable participants as it enables a higher knowledge foundation for the entire team.

Moreover, the findings of all case companies revealed the importance of having someone leading the project that can make sure that the project is steering in the right direction and the in the right place. This is supported by Shanks et al. (2000) and Wang et al. (2008). The findings from this study indicate that users from all case companies understand the importance of project teams and how they should be set up as their reasoning is closely related to the aspects of the CSFs identified in the literature.

Top management involvement

When looking at the perception of top management involvement, the findings of all the case companies showed that the users believed that top management should provide sufficient resources to the project as well as the possibility of full-time dedication to the
project with relief from daily tasks. This is in line with the literature where Bingi et al. (1999), Laughlin (1999) and Shanks et al. (2000) pointed out the need of provision of essential resources for the project from the top management. This was also found to be significant from the senior management perspective. Research showed that managers believed that it is critical that sufficient resources have to be provided by top management as well as support in terms of sufficient time for the responsibilities of the users (Nah et al., 2003; Snider et al., 2009). These findings indicate that users understand the importance of top management involvement, where similar aspects compared to the literature has been identified.

Furthermore, the findings of all the case companies show that the users believed that the involvement of top management is essential which relates to previous research of Snider et al. (2009), where the users welcomed involvement and support from top management.

**Strategic decision-making**

When looking at the perception of strategic decision-making, the findings of all the case companies demonstrated that the implementation strategy must contain clear goals and a good plan from the beginning, include a timeline with a go-live date and include sufficient resources. This is related to the research by Plant and Willcocks (2007) who argued that project managers often emphasize the importance of having defined goals from the start of the project to gain a better understanding of the project. This is also supported by Holland et al. (1999), Nah et al. (2003) and Rosario (2000) who discussed that clear goals and a well-defined business plan are essential factors for a successful project. These similarities between the empirical findings and the literature reveal that the users understand what the strategy must include as well as how it should be presented.

Furthermore, the users from company C argued the importance of having a strategy that justified why the project is needed which is consistent with the research by Gargeya and Brady (2005). The general perception of the users from all case companies within this study indicates that they understand the importance of strategic decision-making and how it can help an ERP system implementation to succeed.
Communication

When investigating communication, all cases revealed that communication should be covering the entire organization. This was also emphasized by Loh and Koh (2004) and Rosario (2000) who stated that expectations from the management should be communicated at every level at the organization. The studies of Sumner (2000) and Wickramasinghe and Gunawardena (2010) from the perspective of project managers explain that they also must maintain honest and open communication with the users and other parties.

Furthermore, Company B and C mentioned that the progress of the ERP project should be communicated. This is consistent with previous research made on the user perspective by Woo (2007) where the users also emphasized the importance of communicating the progress of the implementation. The general perception of the users from all case companies within this study indicates that they understand the importance of communication and how it should be executed.

Project management

When looking at the management of the project, the findings of all cases revealed that the participants have to know what to do, this relates to the research made by Ehie and Madsen (2005) and Laughlin (1999) that emphasizes the need of a work plan. Company B further discussed that it in the project should be made sure that it is progressing according to plan, which also is pointed out in the literature (Ehie & Madsen, 2005; Laughlin, 1999).

Furthermore, Company B discussed the need of milestones which is in line with the perspective of senior managers in the literature, where they state that the best way to manage a project is through deciding upon and reaching milestones (Nah et al., 2003). Company C emphasized the need of having a project manager with knowledge and previous experience which project managers in literature were pointing out to be crucial for the success of the implementation project (Snider et al., 2009).

The research of Maguire et al. (2010) implies that users understand the importance of project management, which is in line with the findings of this study where the case
participants argued the importance of project management in an implementation project as they understood important aspects related to this CSF.

Project support
The next CSF within the framework by Reitsma and Hilletofth (2017) is ‘Project support’ and was found to be of importance for the participants in all case companies. The findings of Company A and C pointed out the need of having consultants supporting the team. This can be related to the research by Maguire et al. (2010) and Snider et al. (2009), who implied that users appreciate the support from consultants and the significant advantage it can be for a successful ERP implementation.

The findings of Company B revealed that the company should have utilized the support from the IT department more rather than having a larger amount of consultants as this would ensure having more people who understand the business. This indicates that the users believed that they could have secure the ERP implementation without having too many consultants involved.

The users from Company A rated project support as important due to having knowledgeable and experienced consultants who understood their business processes and their daily work. Moreover, Company A does not have an IT department, which indicates why the users regarded the help from consultants as important. The research by Adam and O’Doherty (2000) show that project support is particularly crucial in organizations where an IT department is missing.

In contrast to what project support includes in the literature, the users from Company C valued the importance of having its consultants closely geographically located and speaks the same language. The participants believed that an ERP implementation project is completed and the risk of misunderstandings is increased if the consultants do not speak the same language. One of the participants had previous experience from an implementation project where the consultants came from England. The participant further explained that one of the main reasons that the project failed was due to the difficulties they had to understand each other. This statement reveals the importance of having consultants located close as well the importance of the consultants speaking the same
language. The findings of this study indicate that the users understand the importance that consultants can have in an ERP implementation.

Minimum customization
When deciding for customization of the system, the case findings of Company A and C found that by having fewer customizations, it would ease the support for the software vendors. Company B believed that applying customizations to the ERP system might bring issues when new updates are installed. The reasoning of all cases is shared by senior managers where they point out that minimal customization is beneficial since customizations might lead to complexity for the vendor regarding support and when new updates to the system are installed (Chang et al., 2014).

The findings of minimum customization from all cases revealed that the users understand the impact this CSF can have on the ERP implementation project, as they understand the impact of making too many customizations to the ERP system. However, in comparison with the findings of Chang et al. (2014) and Snider et al. (2009), the users were found not to pay too much attention to customization and did not believe that this CSF can have an adverse outcome on the success of the ERP implementation.

Organizational change management
When looking at the perception of organizational change management, the findings of all the case companies presented that the users found this CSF as important. Company B argued that change management might aid to reduce resistance as well as it might help to maintain the motivation of the employees. Company C pointed out that change management is critical as it eases to reduce resistance and aids to provide an understanding of how they will benefit from the new system. These findings are in line with Laughlin (1999) Loh and Koh (2004 and Shanks et al. (2000) who argued that change management must be adequate to overcome potential resistance from the users or lack of employee motivation. Company C argued that the top management need to communicate the change with the employees at the beginning of the project for the employees to have enough time to process the change. This is related to the research of Chang et al. (2014), Nah et al. (2003) and Woo (2007) who argued that it is essential that the change is communicated to prepare the employees for the imminent change.
Company A believed that change management is important for the organization to remain calm and not generate worries about how the change might affect them. They also pointed out that visualization on a possible result of what the new system will provide should be communicated to smoothen the change. Moreover, Company B and C discussed that the employees need to know why the change is needed. None of these statements are supported by the literature.

Chang et al. (2014), Nah et al. (2003) and Woo (2007) pointed out that change management can help reduce the reluctance for change, which is essential for the implementation of an ERP system to succeed. These statements are related to the findings from Company B and C who argued that change management can aid in reducing possible user resistance. The current literature has not investigated organizational change management from a user perspective. However, the findings from all cases in this study indicate that the users are aware of the impact change management can have in an ERP implementation as their reasoning shows ties to the generic perspective.

Business process alignment
The findings of Company A revealed that it is essential to match the business processes of the company to maximize the potential of the ERP system. Company C argued the importance of matching business processes with the ERP system as it allows the system to manage everything the organization needs and verifies that important functionality is kept. This was discussed by Somers and Nelson (2001) and Bingi et al. (1999), who stated that it is vital that the business processes are matched with the functionality of the ERP system. Otherwise, the performance of the organization cannot be improved. Furthermore, Company B and C pointed out that the business processes and the system should go hand in hand and the selection of the system should be with the business processes in mind. Previous research on the user perspective found a similar outcome where users believed that the new ERP system should meet the requirements of the business (Adam & O’Doherty, 2000).

Company C argued that the organization must be able to customize its processes to fit the ERP system. This is in line with the findings of Chen et al. (2009) who found that project managers emphasize that business processes must be adapted to the implemented ERP system since it contributes to more straightforward and standardized processes that
further supports the instances of the ERP system. They further discussed that business processes must be documented as it facilitates to provide clarity and decreases the risk of missing things. The literature could not support this statement.

Lastly, Adam and O’Doherty (2000) examined business process alignment from a user perspective, and their research indicates that users tend to understand the importance of business process alignment and that it is crucial for the ERP implementation to succeed. Their research is related to the findings from all case companies in this study that users understand the impact that re-engineering of business processes can have for the implementation to be as smooth as possible.

Software testing
When looking at the perception of software testing, the findings of all the case companies presented that the users believed that the system must be tested adequately before going live. Company A and C argued that adequate testing to the system allow identification of potential errors in the system. This is in line with the research by Chang et al. (2014); Nah et al. (2003) and Singla and Goyal (2006) who found it important to perform adequate testing to the ERP system before going live.

Findings from Company A and B revealed that it was important to involve the users when testing the software, which could not be identified in the literature. Moreover, Company B and C revealed that the testing should be conducted using scenarios, whereas Company A and C also found it essential to conduct the testing step-by-step, which has not been supported by the literature.

The current literature has not investigated software testing from a user perspective. However, the findings from all cases in this study indicate that the users are aware of the importance of conducting testing of the system as their reasoning is in line with the generic perspective of the CSF.

Performance measurement
When looking at the perception of performance measurement, no shared perception of the reasoning of the CSF could be identified among the case companies. Company B argued that it is important to decide which KPIs that needs to be measured, which is
related to the research of Ehie and Madsen (2005) who discussed that by using quantifiable measures can develop a better understanding of the ERP implementation success. This implies that users from Company B understand that key indicators need to be measured. However, these were not identified.

The findings of Company C reveals that it was important that the assignments do not take too long time to carry out and thus should be streamlined in order not to disrupt the daily work. The literature could not support this statement.

The findings of Company B and C reveals that they found performance measurement as important. This implies that the users from these two companies understand the impact that performance measurement can have. However, no explanation was provided from Company A which implies that they did not perceive performance measurement to be important. This is related to the findings of Amoako-Gyampah (2004) who revealed that users do not perceive performance measurement to be an important CSF for ERP system implementation.

Education and training

The next CSF within the framework by Reitsma and Hilletofth (2017) is education and training, and the findings of all case companies revealed that the users found training of the ERP system to be significant. Company C revealed that training would allow the employees to work independently when the system is live. This is supported by the findings of Dowlatshahi (2005) who pointed out that sufficient training to users can reduce dependency. This implies that when enough training is provided, it decreases the need for having consultants available to help the users.

Company A pointed out that training is critical as it provides an understanding of the functions and increases the possibility of users performing its assignments at a good pace when the system is live. Company B revealed that training was vital as it increases an understanding of the system and its processes so that the users can identify errors and correct them. The literature has not supported these statements.

The findings of Woo (2007) showed that the users believed training to be unnecessary to have a successful ERP implementation. However, the findings of all case companies in
our study indicate that the users believe training to be important due to the thorough understanding the need to know the system and its processes to ensure a high job performance. These findings are in line with the findings of Amoako-Gyampah (2004) and Umble et al. (2003) who found that users considered training to be important in an ERP implementation.

Technical possibilities
When choosing the ERP system, the findings of Company B and C shows that the users believe that it is crucial that the system is on the same level as the business processes. This is in line with literature where Janson and Subramanian (1996) who pointed out the importance of carefully selecting an ERP system that is fitting the business processes of the organization.

There were also some different perceptions that were not consistent with the literature, where Company A discussed that the possibilities the system provided for the gathering of statistics and analysis as well as the provision of how the company is doing so that resources can be distributed to help make improvements in the right areas. Company B explained that gaps in the software must be identified to understand what possible workarounds that might be needed. Company C argued that the possibilities that the ERP system can provide are essential to develop processes that require support from the system and to increase the efficiency.

This indicates that the users believe that technical possibilities are essential when implementing an ERP system as the users see the possibilities to further develop the business. This is opposed to the perception of the users in the study conducted by Amoako-Gyampah (2004), where the users did not seem to believe that technical possibilities are essential for an ERP implementation.
5.2 User perception toward critical success factors in relation to implementation phases

Project team
The findings of company B and C revealed that the users believed the project team to be important throughout all phases of an ERP implementation project. This is supported by Shanks et al. (2000) who argued that the project team is vital in all phases of the implementation. Moreover, Company B and C agreed that the project team is essential in the post-implementation phase since problems might occur after go-live that must be managed by the project team members.

Research by Loh and Koh (2003) shows that it is critical to assign appropriate project team members before initiating the implementation which is in line with our findings where all case companies agreed that the project team must be established before the start of the project. Previous research of Bingi et al. (1999); Somers and Nelson (2004) and Rosario (2000) placed this CSF as most important in the pre-implementation phase. However, no reasoning from the literature could support the statements of their findings.

Top management involvement
The findings of all case companies revealed that involvement from top management was important in all phases of the ERP implementation. Company A and C pointed out that the involvement of top management was important in all phases of the implementation as the management must have a holistic view and understanding of how the project was progressing. This is in line with the literature, who emphasized that the top management must be involved throughout the entire implementation as they need to have an overview of how the project is progressing (Bingi et al., 1999; Shanks et al., 2000; Somers & Nelson, 2004).

However, Company A and B found involvement from top management as important in the pre-implementation phase as well. Company A mentioned that they need to be present early in the implementation to ensure a good start of the project which is supported by Loh and Koh (2003) who argued that the top management is important in the pre-implementation phase without any reasoning that could support their finding.
Strategic decision-making

All cases agreed that the strategy of the project must be clear and done in the pre-implementation phase. Company A and C believed strategic decision-making must be early in the project to provide a good understanding of why the new system was needed to everyone in the organization.

Previous research of Loh and Koh (2003), Roberts and Barrar (1992), Shanks et al. (2009, Somers and Nelson, 2004 and Umble et al., (2003), agreed with the findings of this study and positioned this CSF in the pre-implementation phase, whereas Rosario (2000) placed this CSF within the implementation phase. No reasoning from the literature could support the statements of its findings.

Communication

Communication was seen to be important throughout all phases of an ERP implementation. Company B and C revealed that communication within the pre-implementation phase enabled that information was communicated to everyone. These findings are related with the literature which argues that communication affects the ERP implementation within the pre-implementation phase and implementation phase (Loh & Koh, 2003; Somers & Nelson, 2004; Sumner, 1999).

In contrast to the literature, findings from Company B and C revealed that communication is important in the post-implementation phase since new updates to the system might occur, and communication in terms of follow-ups is needed. Company B argued that communication in the post-implementation phase is essential where learnings are explained, and the progress of the project was followed up. No literature within the framework argued the importance of communication within the post-implementation phase.

Project management

The findings of all case companies revealed that project management is important in the implementation phase whereas Company A and B shared the same perception and believed that project management must be available throughout all phases of the ERP implementation. This is slightly related to the findings of Loh and Koh (2003) who pointed out that the project must be planned in the pre-implementation phase.
Company C argued that project management is vital during the implementation phase as the organization must evaluate which functions that need to be revised as well as evaluate which functions of the project that needs to be prioritized. This is related to the findings of Shanks et al. (2005) who argued that this CSF is most important early in the implementation phase. Previous research of Nah et al. (2003), Somers and Nelson (2001) and Umble et al. (2003) placed this CSF as most important in the implementation phase. No reasoning from the literature could support the statements of its findings.

Project support
Company B and C agreed that the project must be assisted throughout the entire ERP implementation as knowledgeable consultants have to be available to support the users in critical moments.

Previous research of Somers and Nelson, (2004) agreed with the findings of this study and positioned this CSF as important throughout all phases of an ERP implementation. However, no reasoning from the literature could support the statements of their findings.

Minimum customization
All the case companies believed that customization of the ERP system must be made in the pre-implementation phase, where Company A and C believed it to be important in the early stages due to reduce difficulties later in the project and for the system to work correctly.

Previous research of Bingi et al., (1999), Loh and Koh (2003), Roberts and Barrar (1992), Rosario (2000) and Sumner (1999) argued that this CSF is most important in the implementation phase. No reasoning from the literature could support the statements of its findings.

Organizational change management
Change management was found to be important throughout all phases of an ERP implementation for the case companies. Company A and B discussed that change management must be available throughout the entire project due to new updates to the system and to reduce resistance. Company C believed that change management must be
present throughout the entire project as users learn and adapt in different speed and must therefore be available until everyone feels safe with the change.

Loh and Koh (2003) argued that change management is most important in the implementation phase and does then continue to be important in the post-implementation. Previous research of Nah et al., (2003), Somers and Nelson, (2001), Roberts and Barrar (1992), Rosario (2000) and Umble et al., (2003) argued that this CSF is most important in the implementation phase, whereas Shanks et al. (2000) placed this CSF as most important in the post-implementation phase. However, no reasoning from the literature could support the statements of its findings.

Business process alignment
The findings of Company A and C revealed that business process alignment is essential in the implementation phase and the post-implementation phase, which is in line with the research of Loh and Koh (2003) who showed that matching the system to the business processes should happen in the implementation phase. In contrast to the literature, Company B believed that evaluation of current business processes and matching those with the system should take place in the pre-implementation phase.

Company A found business process alignment as critical in the post-implementation phase since some business processes will need to be modified after going-live due to new updates to the system. Shanks et al. (2000) and Somers and Nelson (2004) argued that this CSF is most important in the post-implementation phase. However, no reasoning from the literature could support the statements of their findings.

Company C found this CSF as important in the implementation phase as the organization now can see processes in the system and reveals how they are responding in practice. Moreover, company C believed that business process alignment also is essential in the post-implementation phase as the organization now can see how the business processes are matching with the system and can modify if needed.

Previous research of Bingi et al. (1999), Nah et al. (2003), Somers and Nelson (2001), Umble et al. (2003), Roberts and Barrar (1992), Rosario (2000) and Sumner (2000)
revealed that this CSF is most important in the implementation phase without revealing any reasoning that could support their findings.

Software testing
The findings of all case companies revealed that software testing was important in the implementation phase as it allowed them to ensure a safe go-live of the ERP system. This is in line with the research of Loh and Koh (2003) and Nah et al. (2003) who argued that software testing must be conducted in the implementation phase and just before going live. Previous research of Bingi et al. (1999) and Rosario (2000) supported our findings and revealed that software testing should be conducted in the implementation phase. No reasoning from the literature could support the statements of the findings.

The findings of Company A and B showed that software testing must also take place in the post-implementation phase when potential updates to the system are installed. However, no literature could support the findings from Company A and B.

Performance measurement
Performance measurement was found to be important in the post-implementation phase, which is in line with the research of Loh and Koh (2003) who stated that measuring the performance of the system is most impactful in the post-implementation phase.

Company A believed that performance measurement could only be conducted a year after the system is implemented whereas Company B stated that performance measurement could be conducted when the organization has a better understanding of how the system is functioning. Company C had related a view on performance measurement and argued that it can first be measured when the ERP is working correctly. The literature could not support these statements. Previous research of Roberts and Barrar (1992), Rosario (2000), Sumner (1999) and Umble et al. (2003), argued that this CSF is most important in the post-implementation phase without revealing any reasoning that could support their statements.

Education and training
The findings of Company B and C reveals that education and training are essential in the implementation phase as well as in the post-implementation phase. Company C believed that training must be conducted before going live. These findings are related to the
research of Loh and Koh (2003) who found this CSF as primarily impactful in the implementation phase, just before going live.

Moreover, the findings of Somers and Nelson (2004) reveals that education and training are essential throughout the entire ERP project, which is related to the findings in Company A who believes that training is important in all phases of the implementation as it helps to decrease confusion amongst the users.

Company B believed that training is vital in the post-implementation phase as it should be provided when new updates to the system are released. Shanks et al. (2000) placed this CSF in the post-implementation phase without revealing any reasoning that could support the statements of its findings.

Technical possibilities

The findings of all case companies revealed that technical possibilities are most impactful in the pre-implementation phase. Company A and C argued that the technical possibilities must be evaluated at the beginning of the project to ensure that the organization is certain of the possibilities the selected ERP system can provide. This is in line with the research of Loh and Koh (2003) and Somers and Nelson (2001) who provided findings that the selection of ERP system must be managed at an early stage of the implementation project where potential software solutions and their possibilities should be examined in the pre-implementation phase.

Company C believed that the technical possibilities of the system must continually be developed. However, no literature could support the findings from Company C.
6 Conclusion

In chapter six, the conclusion of the study is presented by fulfilling the purpose of the study and answering the two research questions.

This study aimed at investigating CSFs for ERP implementation from a user perspective and why the CSFs are important in relation to the phases of an ERP implementation. The following research questions allowed the researchers to reach the purpose by conducting case studies.

RQ 1: How are the critical success factors for the implementation of an ERP system apprehended from a user perspective?

The findings of the study revealed that two of the case companies perceived all of the CSFs to be essential, whereas all of them agreed on 12 CSFs to be important. Many of the cases shared reasoning to some extent of why the CSFs are seen to be essential. Furthermore, the cases provided reasoning that was found to be related to the literature as well as unique perceptions that could not be supported. Interestingly, users in this study found the CSFs ‘minimum customization’, ‘education and training,’ ‘technical possibilities' and ‘performance measurement' to be essential to succeed, which users in previous research did not find to be important.

RQ 2: Why are the investigated critical success factors important within the implementation phases from a user perspective?

The result of the cross-case analysis showed that the shared perception of why the CSFs are important in the specific phases was shared across some of the cases, but no reasoning was common for them all which might be due to limited knowledge within the area. This means that most of the perceptions were individual for the specific cases. However, all cases showed a shared perception for eight CSFs in at least one phase. Similarly to the previous research question, the findings of the cases revealed insights that were similar to the literature as well as perceptions that were not reflected in previous research.
7 Concluding discussion

In this chapter, the theoretical and managerial implications are given, followed by the limitations of the thesis and finally, suggestion for further research are presented.

7.1 Theoretical implications

The objective of the study was mainly to fulfill two gaps in the literature by contributing to how the CSFs for ERP implementation is perceived by the operational users as well as why the CSFs are important in the phases of an implementation. The findings provided an insight of the perception of the users toward 13 CSFs compared to previous research where eleven CSFs were investigated from a user perspective. Findings from the cases identified gaps and similarities between the interviewees compared to users, senior managers and project managers within literature. As differences between users in this study and users in previous research were found, further research is needed to investigate why there are differences. Furthermore, this study provided new reasoning of the two CSFs ‘organizational change management,’ and ‘software testing’ as underlying reasoning from the perspective of the users have not been investigated in the literature. This presents a research gap that needs further attention to get a more thorough understanding of why the two CSFs are essential for users in an ERP implementation.

Moreover, the findings contribute to the gap of the user perception of the CSFs in relation to the phases of an ERP implementation, which has not been investigated in previous research. The findings reveal insights into why the users believed the CSFs to be important in the phases of an ERP implementation which can be used as a future reference for research within the same area. However, due to the vague reasoning of why the CSFs are essential in the phases of an ERP implantation in literature, this presents another research gap. A more thorough understanding of the CSFs within the phases is needed to get a more detailed insight into why the aspects of the CSF should be taken into consideration to succeed with the ERP implementation.

7.2 Managerial implications

The managerial implications of this study are that the involvement of users as well as their reasoning when implementing an ERP system is vague. By including the users in the project team before starting the implementation process and put attention to their
reasoning, this will aid the understanding of users and what they find to be the essential aspects of the CSFs that should be addressed. These aspects would then serve as input for practitioners and researchers to modify current implementation strategies and processes to ensure that the CSFs includes all needed aspects for the entire organization. This might result in increased chances of a successful ERP implementation.

Furthermore, the knowledge of the importance of the CSFs within the phases of implementation is lacking. By understanding why the CSFs are important in the phases, the understanding of essential aspects of the specific phases can assist what should be addressed when and where. Thus, the reasoning of why the CSFs are considered essential within the phases can assist researchers and practitioners to develop a strategy that follows a more thorough process within each of the phases. This would possibly lead to a substantially smoother implementation process.

7.3 Limitations

This study comes with certain limitations that need to be considered. First, the time-restriction for this thesis resulted in need of conducting a cross-sectional study since it allowed us to study the phenomenon for a specific time, which was approximately five months. However, a longitudinal study where the phenomenon is investigated for a longer time would allow examining the evolution of change, development, and acceptance of the users concerning the CSFs.

Second, the sample of all the case companies for this study originated from Sweden. The inclusion of users from other organizations outside of Sweden might provide different findings for the investigated CSFs due to having cultural differences affecting their perceptions. Furthermore, the companies have not been selected regarding size, industry or IT knowledge within this study. By selecting case companies regarding these criteria's, the findings might have been more generalizable for a particular industry or several different industries with a similar size and experience. However, this was not possible in this study since the sample of possible participating companies was small and thus the selection of cases could not be based on these criteria's.
Third, there was no comparability of the participants in this study since their job positions were not considered and matched across the cases. By including participants with the same job positions, more generalizable results could have been achieved.

Fourth, the ranking concerning the importance of the CSFs in general and within the phases from the user perspective is not considered due to the qualitative nature of this thesis. To rank the importance of the CSFs in general and within the implementation phases, a quantitative approach, for example, a survey where rates of importance are ranked is needed.

7.4 Future research

Due to the limitations, further research could be conducted on how users rank the CSFs within the implementation phases, combining it with its underlying reasoning by adopting a mixed-method of qualitative and quantitative research. This would allow understanding of what implementation phases the users perceive the CSFs to be most important and the reasoning behind this importance.

To extend the reasoning of the users, it would have been interesting to study the perception of users within organizations located outside of Sweden. Moreover, by selecting companies based on industry, size and IT knowledge and by including participants with similar job positions and tasks, generalizable results can be achieved. This could also lead to the identification of similarities and differences compared to the findings of this thesis.

When this research was carried out, no previous research had focused on why users perceive the investigated CSFs to be important within the different implementation phases. It would be interesting to investigate further why the CSFs are perceived as important in the phases of an implementation using a larger sample of case companies, including more participants that have been part of an implementation project. This would add a more rigorous and rich perspective of the users within this aspect.
8 References


Appendix

Appendix: Interview guide 1

The interview was started by providing an overview of the study to the participant. The participant was informed about ethical considerations for the interview as well as consent for conducting and recording the interview.

**General questions:**
- How long have you been working at this company?
- Were you a part of the implementing project team?

**Main questions**
Ask probing questions as: “Why” or “How” if needed

**Project team**
- How do you think the project team(s) were formed for the implementation?
- What is your apprehension of the importance of project team for an ERP implementation?
- What do you think is important when it comes to the project team?

**Top management involvement**
- How was the top management involved in the implementation process?
- What is your apprehension of the importance of top management involvement for an ERP implementation?
- How do you think that top management should be involved?

**Strategic decision-making**
- How was the implementation strategy formed for the implementation?
- What is your apprehension of the importance of strategic decision-making for an ERP implementation?
- What do you think a strategy should include for you as a user to understand the implementation process?

**Communication**
- How was the implementation and information regarding the implementation communicated across the entire implementation process?
- What is your apprehension of the importance of communication for an ERP implementation?
- How do you think that communication should work in an ERP implementation?

Project Management
- How was the implementation project managed?
- What is your apprehension of the importance of project management for an ERP implementation?
- How do you think a project should be managed?

Project support
- How was the support of the implementation project conducted?
- What is your apprehension of the importance of project support for an ERP implementation?
- What do you believe project support should be like?

Minimum customization
- How was the system customized when installed?
- What is your apprehension of the importance of minimum customization for an ERP implementation?

Organizational change management
- How was the change process managed across the entire implementation process?
- What is your apprehension of the importance of organizational change management for an ERP implementation?
- How do you think that the change process should be managed?

Business process alignment
- How were the business processes matched with the system?
- What is your apprehension of the importance of business process alignment for an ERP implementation?

Software testing
- How was the system tested throughout the implementation?
- What is your apprehension of the importance of software testing for an ERP implementation?
- How do you believe that the testing should be conducted?
Performance measurement
- How was performance measured throughout the implementation?
- What is your apprehension of the importance of performance measurement for an ERP implementation?
- How do you believe that performance should be measured?

Education and training
- How was training and education conducted throughout the implementation?
- What is your apprehension of the importance of education and training for an ERP implementation?
- How do you believe that training and education should be conducted?

Technical possibilities
- How were the technical possibilities of the system matched with the company?
- What is your apprehension of the importance of technical possibilities for an ERP implementation?
- How do you believe the technical possibilities of an ERP system should be matched with the company?

Phases of the implementation
- In what phases of the implementation, do you believe that the aforementioned CSFs are important?

Phases of the implementation
- In what stages of the implementation (before, during, after), do you believe that the aforementioned CSFs are important?
  - Why is it important at that/those stage/stages
### Appendix A: Within-case analysis - A I

<table>
<thead>
<tr>
<th>Critical success factors</th>
<th>Important (Yes/No)</th>
<th>Description</th>
<th>Sources</th>
<th>Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project team</strong></td>
<td>Yes</td>
<td>It is important to have a shared understanding of the project team with an excellent communication present to ensure that the project progresses in the right place. This is directed by a project leader that should have a deeper understanding of the business processes of the company and to criticize current work procedures. Furthermore, users should take part in the project team to increase the understanding of the project at an earlier stage.</td>
<td>Participant 1,2,3</td>
<td>“The project leader should take time to get a deeper understanding of the organization and question why you do as you do at the company.” (Participant 1, 2018-04-06) “There should be a understanding between the members within the project team, a communication should be established so that the team is progressing in the right pace” (Participant 2, 2018-04-12) “All the employees that will become users of the system should take part in the project so that they increase the understanding from the start of the project” (Participant 3, 2018-04-13)</td>
</tr>
<tr>
<td><strong>Top management involvement</strong></td>
<td>Yes</td>
<td>The top management is important if it is a holistic process. The type of involvement depends on the technical knowledge where more knowledgeable managers should be involved on a more detailed level. Lastly, the people involved in the project must be provided support from the management in terms of sufficient time and assistance.</td>
<td>Participant 1,2</td>
<td>“In our case it was an holistic process and then I think it is very good to have involved top management.” (Participant 1, 2018-04-06) “If you do not get the needed time or assistance from the top management, I do not think that the project will succeed if you have to struggle with the time it takes” (Participant 1, 2018-04-06) “If the manager has a technical background with previous experience, then I think that the manager can be involved on a more detailed technical level” (Participant 2, 2018-04-12)</td>
</tr>
<tr>
<td>Strategic decision-making</td>
<td>Yes</td>
<td>The management should provide a clear direction of what path the company wants to take. This is in the form of a strategy that includes a plan that should be communicated down in the organization to inform the employees about the new system, how this will affect their current routines and processes and make everyone work toward the same goal.</td>
<td>Participant 2,3</td>
<td>“It is important to get a clear direction from the management that tells us what path we want to take.” (Participant 2, 2018-04-12) “There should be a plan that is communicated down in the organization. It is important since it is a big step, so even if everyone was is not involved technically in the project they all know that they will be affected by a new system. This resulted in new routines, new work processes and so on.” (Participant 2, 2018-04-12) “A strategy is important to make everyone work toward the same goals since it makes it easier to do a good job.” (Participant 3, 2018-04-13)</td>
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<tr>
<td>Communication</td>
<td>Yes</td>
<td>It is important that someone is leading and telling the participants what to do otherwise no one knows what should be done and when it should be done. The scope of the project should be clear from the beginning since it affects the whole organization.</td>
<td>Participant 1,2</td>
<td>“To get an understanding of each other and in such a large project involve employees so that they feel are a little part of the implementation project even if they are not.” (Participant 2, 2018-04-12) “I believe that if there is something to say it should be communicated in the organization. This is never bad since you avoid rumours and own interpretations from those who are not involved in the project.” (Participant 2, 2018-04-12) “Communication overall is important, since we discovered that it is important to communicate within the whole chain. This is because of the things I do someone else will be affected by and if someone does something after that, I might get affected again.” (Participant 1, 2018-04-06)</td>
</tr>
<tr>
<td>Project management</td>
<td>Yes</td>
<td>It is important that someone is orchestrating, leading and telling the participants what to do otherwise no one knows what should be done and when it should be done. The scope of the project</td>
<td>Participant 1,2</td>
<td>“It is very important to know the scope from the beginning as the path you take affects all parts of the chain.” (Participant 2, 2018-04-12) “Project management is important since otherwise you do not know what you should do right now.” (Participant 1, 2018-04-12)</td>
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<td>Project support</td>
<td>Yes</td>
<td>The project support should be in the</td>
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<td>form of understanding and resources</td>
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<td>from the vendor to make the process</td>
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<td>as short as possible without passing</td>
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<td>on the quality. It is also seen as</td>
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<td>necessary that the consultants are</td>
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<td>present for a longer time, keeps an</td>
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<td>open mind, understands the tasks and</td>
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<td>the daily work of the employees.</td>
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<td>Participant 2,3</td>
<td>“I believe that the support should</td>
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<td>be in form of understanding and</td>
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<td>to finish the process as soon as</td>
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<td>possible without lowering the quality.” (Participant 2, 2018-04-12)</td>
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<td>“It was important that the consultants</td>
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<td>were here for a longer period of</td>
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<td>time.” (Participant 3, 2018-04-13)</td>
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<td>“I think it is important that the</td>
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<td>consultants are open-minded and</td>
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<td>understand my tasks and my workday.”</td>
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<td>(Participant 3, 2018-04-13)</td>
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<td>Minimum customization</td>
<td>Yes</td>
<td>By having a system that is closer to</td>
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<td>the standard it eases troubleshooting</td>
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<td>for the system vendor as the standard</td>
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<td>version should be known by everyone</td>
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<td>at the vendor support, if more</td>
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<td>customizations are made there are</td>
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<td>fewer people at the vendor support</td>
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<td></td>
<td>Participant 2</td>
<td>“If you have a plain standard</td>
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<td>solution, anyone at the helpdesk of</td>
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<td>the vendor can help you.” (Participant</td>
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<td>2, 2018-04-12)</td>
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<td>“If you have a lot of special</td>
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<td>customizations it is clear that it</td>
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<td>would be more difficult for the</td>
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<td>support to help.” (Participant 2,</td>
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<td>2018-04-12)</td>
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<td>Organizational change</td>
<td>Yes</td>
<td>Change management is important to</td>
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<td>management</td>
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<td>make the organization remain calm.</td>
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<td>Otherwise, it might lead to people</td>
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<td>having discussions with each other as</td>
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<td>they are not sufficiently informed</td>
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<td>and might be worried how the change</td>
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<td>will affect them. By involving</td>
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<td>Participant 2,3,4</td>
<td>employees at</td>
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<td>“Change management is partly</td>
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<td>important as the employees might</td>
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<td>get uncertain and worried.” (Participant 4, 2018-04-13)</td>
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<td>“It is probably important to spread</td>
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<td>a calm within the organization, when</td>
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<td>you are uncertain there will be many</td>
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<td>discussions in the corridors, so I</td>
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<td>believe that if you are taking part</td>
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<td>from the beginning it will be better.” (Participant 2, 2018-04-12)</td>
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<tr>
<td>Requirement</td>
<td>Status</td>
<td>Description</td>
<td>Participants</td>
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<tr>
<td>Business process alignment</td>
<td>Yes</td>
<td>Business process alignment is vital since more complex organizations require more customization to maintain needed functionality. The adaptation of the processes when possible is necessary to be able to maximize the potential of the system.</td>
<td>Participant 1,2</td>
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<tr>
<td>Software testing</td>
<td>Yes</td>
<td>Testing of the software is vital to know that the system and its customizations are operating correctly. Furthermore, the testing allows identification of potential bugs, errors, and flaws at an earlier stage so that it will not affect the operation of the organization after going live. To test the system, users should take part in a step-by-step-testing method to view the flow from beginning to end which might result in the identification of errors.</td>
<td>Participant 1,2,3</td>
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</table>

“Share information about what is going on and have status updates.” (Participant 3, 2018-04-13)
“We will work differently when the project is finished so there should be continuous change management and visualization of what the result will look like.” (Participant 2, 2018-04-12)

“In a complex company standard systems does not work which we experienced as we had to skip a lot of functionality we required, to be able to launch the system.” (Participant 1, 2018-04-06)
“In order to make use of most of the functionality that the system offers, you might have to adapt your organization accordingly to be able to reach the full potential of the system.” (Participant 2, 2018-04-12)

“It is very important to test the system to know that everything is working as it should in the background, especially if there is customizations so they work as they should.” (Participant 1, 2018-04-06)
“It is important to test so that bugs and errors can be identified before going live, if there are some bigger error when you have gone live it will affect the operation.” (Participant 2, 2018-04-12)
“It is better to find potential errors, flaws or things that could have been better at an earlier stage.” (Participant 2, 2018-04-12)
“Go step-by-step and monitor the flow and allow the employees to see how the project is progressing. This might result in noticing things that are wrong and reduces the risk for problems to occur in a later stage” (Participant 3, 2018-04-13)
<table>
<thead>
<tr>
<th>Performance measurement</th>
<th>No</th>
<th>Education and training</th>
<th>Yes</th>
<th>Training is important to develop a better understanding of the system's functions so that when the system is live, the user can perform its tasks at a good pace. Furthermore, the training should be easy to understand so that new users need less time to learn how to use the system.</th>
<th>Participant 2,3,4</th>
<th>“The training has to be done, otherwise you will have a system with many possibilities but if you did get educated in how you are using these possibilities that the system offers, then you have maybe 50% or 10% use of the system but then it is not an advantage for you.” (Participant 2, 2018-04-12) “The training should generally be easy to understand, we should be able hire a new employee who does not need weeks to understand how to do.” (Participant 4, 2018-04-13) “Training is important so that you know what to do, so the work tasks flow at a fairly good pace when you go live so that you avoid problems later when going live.” (Participant 3, 2018-04-13)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical possibilities</td>
<td>Yes</td>
<td>As for the technical possibilities that the ERP system brings, technical possibilities is essential as it assists gathering of statistics and analysis as well as providing an overview of how the company is doing so that resources can be distributed to help make improvements in the right areas.</td>
<td>Participant 2,4</td>
<td>&quot;It is important to be able to pull statistics and analysis from the system.” (Participant 2, 2018-04-12) &quot;You can see how the company is doing which would help you allocate resources to be able to do improvements in the right areas.&quot; (Participant 4, 2018-04-13)</td>
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</tbody>
</table>
### Appendix B: Within-case phases - A I

<table>
<thead>
<tr>
<th>Critical success factors</th>
<th>Phase/Phases</th>
<th>Description</th>
<th>Source</th>
<th>Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project team</td>
<td>Pre-implementation, implementation</td>
<td>The project team is important in the pre-implementation phase and implementation phase.</td>
<td>Participant 2,3</td>
<td>&quot;Before and during the implementation.&quot; (Participant 3, 2018-04-13) &quot;Before and during the implementation.&quot; (Participant 2, 2018-04-12)</td>
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<tr>
<td>Top management involvement</td>
<td>All phases</td>
<td>The top management must be involved throughout all phases of the implementation as they need to have an overview of how the project is progressing.</td>
<td>Participant 1,2</td>
<td>&quot;Especially in the beginning of the project in order for the project to get a good start but they must be involved throughout all phases of the implementation.&quot; (Participant 1, 2018-04-06) &quot;I think it has with what goals the company have but I’ll say that this CSF is most important during the implementation.&quot; (Participant 2, 2018-04-12)</td>
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<tr>
<td>Strategic decision-making</td>
<td>Pre-implementation, implementation</td>
<td>This CSF is important in the pre-implementation phase and the implementation phase to have a clear view of what is needed to do and when it is needed.</td>
<td>Participant 2</td>
<td>&quot;You need to know what to do and when it is needed to be done before the start of the project&quot; (Participant 2, 2018-04-12)</td>
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<table>
<thead>
<tr>
<th>Topic</th>
<th>Phase</th>
<th>Description</th>
<th>Participants</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>Communication</td>
<td>All phases</td>
<td>Communication must be clear throughout all phases of the ERP implementation.</td>
<td>Participant 1,3,4</td>
<td>&quot;Communication must be clear throughout the entire project.&quot; (Participant 1, 2018-04-06) &quot;Throughout all phases&quot; (Participant 3, 2018-04-13) &quot;Throughout the entire ERP implementation.&quot; (Participant 4, 2018-04-13)</td>
</tr>
<tr>
<td>Project management</td>
<td>All phases</td>
<td>Project management is important throughout the entire project as goals and plans might be changing throughout the project.</td>
<td>Participant 4</td>
<td>&quot;As long as the project is still alive so I would say throughout the entire implementation but especially before and during.&quot; (Participant 4, 2018-04-13)</td>
</tr>
<tr>
<td>Project support</td>
<td>Pre-implementation, implementation</td>
<td>Project support is especially important in the implementation phase, and the post-implementation phase, when issues might occur that needs to be solved and support in terms of consultants needs to be available.</td>
<td>Participant 1</td>
<td>“We went from having no system, so all of us were beginners and by having our consultants were very important for us as they knew more about ERP and would assist us” (Participant 1, 2018-04-06)</td>
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<tr>
<td>Minimum customization</td>
<td>Pre-implementation</td>
<td>In the early stages of the project to identify the conditions and what customizations that the system needs to work correctly.</td>
<td>Participant 2</td>
<td>“In the beginning of the processes so you at least know the conditions and what will happen. Can be hard to do a lot of customization afterwards.” (Participant 2, 2018-04-12)</td>
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<tr>
<td>Organizational change management</td>
<td>All phases</td>
<td>Change management is important throughout the entire project. Employees might be afraid of the change, and there might be resistance to new updates.</td>
<td>Participant 2,4</td>
<td>&quot;There might be resistance before and during the implementation where a lot of people feel confused.&quot; (Participant 2, 2018-04-12) &quot;Everyone must be aware of the change before the start of the project in order to be able to process the change&quot; (Participant 4, 2018-04-13)</td>
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<tr>
<td>Business process alignment</td>
<td>Implementation, post implementation</td>
<td>Business process alignment is important in the implementation phase and the post-implementation phase as some processes must be developed even after go-live due to new updates to the system.</td>
<td>Participant 2</td>
<td>&quot;During and after, you have to develop your processes even after go-live as it might come new updates etc. we have some processes that are manually and these had to be done after the implementation.&quot; (Participant 2, 2018-04-12)</td>
</tr>
<tr>
<td>Software testing</td>
<td>Implementation, post-implementation</td>
<td>Software testing is important just before going live but also in the post-implementation phase. The testing must take place when the system is almost done to ensure that everything is working appropriately and in the post-implementation phase, the testing must take place to ensure that the new processes and updates are working as they should.</td>
<td>Participant 1,4</td>
<td>&quot;In the end of the implementation phase. When you get closer to go-live is software testing crucial but also after go-live so you don’t just drop it and think it is done.&quot; (Participant 1, 2018-04-06) &quot;Before going live but also after as new processes and updates will come up&quot; (Participant 4, 2018-04-13)</td>
</tr>
<tr>
<td>Performance measurement</td>
<td>Implementation, post implementation</td>
<td>Performance measurement is important in the implementation and post-implementation phase.</td>
<td>Participant 4</td>
<td>&quot;It is first 1 year after going live you can see and measure performance.&quot; (Participant 4, 2018-04-13)</td>
</tr>
<tr>
<td>Education and training</td>
<td>All phases</td>
<td>Training and education of the system are important in all phases, especially in firms lacking an IT department and only have insufficient previous experience.</td>
<td>Participant 1,4</td>
<td>&quot;Training must be provided to the user in all phases if needed. I learn something new in the system regularly.&quot; (Participant 1, 2018-04-06) &quot;Important to put effort in training the employees so they don’t get confused.&quot; (Participant 4, 2018-04-13)</td>
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<tr>
<td>Technical possibilities</td>
<td>Pre-implementation</td>
<td>Technical possibilities are essential in the pre-implementation phase. Before implementing the system, the organization must be aware of the technical possibilities the system can provide and how they are matched with the business processes.</td>
<td>Participant 2,4</td>
<td>&quot;I know we don’t have the financial resources to customize everything and to have a system that is completely matched with how the company are working, but before the implementation should this factor be decided.&quot; (Participant 4, 2018-04-13) &quot;I would say that you need to know these before the implementation. You must know or at least check the different systems and how the possibilities are matched with the company so you know which way to go and what you should aim at after the implementation. &quot; (Participant 2, 2018-04-12)</td>
</tr>
<tr>
<td>Critical success factors</td>
<td>Important (Yes/No)</td>
<td>Description</td>
<td>Sources</td>
<td>Quotes</td>
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</table>
| Project team             | Yes               | It is important to have people that have an understanding of the business and makes sure that everything in the system is working. These people should also have previous experience from other successful projects to provide confidence to the team. Furthermore, a project leader is vital to make sure that the project is going in the right direction, making sure that the time plan of the project is kept and that there are sufficient resources and budget for the project. | Participant 1, 2 | “It is important to have people that really understands the business, that understands that an ERP system is one thing but you have to understand your business to make sure that everything in the system is working.” (Participant 2, 2018-04-17)  
“A project leader is important to keep an overview.” (Participant 2, 2018-04-17)  
“It is important to have people onboard that have experience from previous successful projects, that gives confidence to the whole team. Emphasize the understanding of the business. It is crucial that there is consultants that can cover the business.” (Participant 1, 2018-04-16)  
“It is very important to have these skilled people that have done this before and that knows how to proceed. It is never like that everything is going according to the plans. Then it is good to have people that have experience.” (Participant 1, 2018-04-16)  
“It was too many consultants within the team, this disrupted the balance of the group consisting of local users as well as management from the group since the project is something that the group is steering.” (Participant 2, 2018-04-17) |
<table>
<thead>
<tr>
<th>Top management involvement</th>
<th>Yes</th>
<th>The top management is vital since it is them that holds the knowledge of how the organization is working, in what direction the company wants to go and maintain a holistic perspective of the implementation project and its goal. The people in the organization needs to know that support will be provided. Furthermore, there should be transparency between the top management and the users, so that questions from users can be answered. Lastly, team participants should have support in terms of full-time dedication to the project and be relieved from daily tasks.</th>
<th>Participant 1, 2</th>
<th>&quot;In the end it is the management that should hold strong knowledge in how well the organization is doing and in what direction we want to go, have a better holistic view of the project and what the goal is.” (Participant 2, 2018-04-17) &quot;Also that the people that are a part of the project team can take part to a hundred percent. So that they are away from their daily tasks.” (Participant 2, 2018-04-17) “We had business process managers in the company that answered the questions. There is a uniform solution that provides a transparency.” (Participant 1, 2018-04-16) &quot;They need to say why we do it.” (Participant 1, 2018-04-16)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic decision-making</td>
<td>Yes</td>
<td>It is crucial to have a clear strategy, the entire organization that will operate the ERP system has to understand. The management should have a good plan with a reasonable timetable, sufficient resources, follow critical milestones and only proceed when those are</td>
<td>Participant 1, 2</td>
<td>&quot;I think it is very important to have a clear strategy. It was presented to us fairly early and could have been even better to make sure that the entire organization that will be in contact with the ERP system really understands.” (Participant 2, 2018-04-17) “They need to have good planning. That there is a reasonable time-table. Make sure that we have enough resources. Follow critical milestones and only proceed when they are solved. Really bad to go-live with a bad solution. Resources and budgeting is very important.” (Participant 1, 2018-04-16) “I think that there should be an overview for the project team and also for the top and middle managers for what is provided. Exactly what solution it is. Visualize</td>
</tr>
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</table>
solved. Furthermore, there should be a holistic overview of what solution is provided for the project team and managers. This overview should be visualized to show how solutions are integrated and how they will help the business proceed.

| Communication | Yes | Communication is vital to creating an understanding of the processes from beginning to end in the organization. It helps to create an understanding of cross-functional processes among the teams in the organization. The communication should cover the entire organization to create an understanding of what is going on and why. This would make sure that more employees are taking part. | Participant 1, 2 | “To make sure it gets right. That it works for everyone. So that everyone understands the processes from beginning to end. Especially in our project where there were a lot of standardizations but also to become more cross-functional, how we are going to work in the future. Then it is of course important that you understand how the other teams have thought in regard to some processes so that you understand the entire cross-function from beginning to end.” (Participant 2, 2018-04-17) “To me it is important that the entire organization gets to take part of the communication because it is harder for someone that are working in for example production to fully grasp or understand what is going on and why. Make sure that everyone in the organization are taking part.” (Participant 2, 2018-04-17) “What people don’t know, they are afraid of. So the people know that they will get the right support.” (Participant 1, 2018-04-16) |
| Project management | Yes | It is crucial that there is someone that is managing the project and makes sure that the project is progressing according to plan. This should be in the form of a project manager who should have a holistic view, coordination as well as making sure that there are sufficient resources and budget. Furthermore, there should be a clear time plan that includes milestones to ensure that the team knows what is needed and what should be done. | Participant 2 | "It is important that there are people that really are making sure that we have resources and that we have the budget in place and that we are progressing according to the time plan.” (Participant 2, 2018-04-17)  
"Have resources available, have a good time plan with good segments and milestones so that you before go-live know what is needed and what should be done.” (Participant 2, 2018-04-17) |
| --- | --- | --- | --- | --- |
| Project support | Yes | There should be an emphasis on using intern resources in the form of for example IT-staff to provide support instead of having a big number of consultants. By having more consultants, there is a risk that fewer know the business leading to the consultants needing to have explanations of the business of the company. This would also increase the risk of it | Participant 2 | "We had way too many consultants in our project, the best is if you can use intern resources which in our case would have been to include our own IT-staff in the projects.” (Participant 2, 2018-04-17)  
"When we started our project we had to start to explain our business to the consultants which was an unnecessary risk and took valuable time. They had great knowledge about the system, but they did not have any understanding for our business. This means that it takes more time and there is a risk that something will go wrong. It also more expensive to have consultants as well.” (Participant 2, 2018-04-17) |
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<tr>
<td><strong>Minimizing Customization</strong></td>
<td>Yes</td>
<td>When customizing the system, customizations might bring issues when applying updates. However, even if a standard solution would be more straightforward, the system must fit the business and its requirements which would require customizations.</td>
<td>Participant 2</td>
<td>“Updates are coming continuously so if you have many customizations you will encounter issues sooner or later with the customizations since maintaining the customizations might be messy. It is easier to go standard.” (Participant 2, 2018-04-17)</td>
</tr>
<tr>
<td><strong>Organizational Change Management</strong></td>
<td>Yes</td>
<td>Change management is essential so that the employees understand the reasons for the change and why is the organization needs it. This is especially important since some employees might not see any improvements in their work and then they need to get an understanding of how the changes will help the organization as a whole. As employees might be uncertain and afraid of the change, the communication of the changes</td>
<td>Participant 1, 2</td>
<td>”Change management is important in order for people to understand why we for example have to change a work task that we have performed in the same way for ten years. I have to understand the whole picture. If I do not see any improvements in my own tasks and only see that things will change, I have to understand the big picture of what we are doing and why. This is to maintain the motivation of the employees and avoid resistance and irritation.” (Participant 2, 2018-04-17) “Information about what is going to happen should be communicated. Then during the project the information should be broken down to a more concrete level so that the users during the progress of the project understands why we are doing this, so that there is not only information that there is a project and then suddenly we are live in the new system.” (Participant 2, 2018-04-17) “I think that it has with communication to do. People might be unsure and afraid of how to do.” (Participant 1, 2018-04-16)</td>
</tr>
</tbody>
</table>
| Business process alignment | Yes | It is essential to make sure that the system and the business processes go hand in hand. Otherwise, it would lead to significant problems after going live. There might be workarounds that would work, but if those are not supported, there might be a risk of needing manual workarounds. | Participant 1 | “Because if the processes and the system does not go hand in hand, after go-live we will have big problems.” (Participant 1, 2018-04-16)  
“I believe it is good to have standard but to adapt to the local business and requirements. Often it might not correspond fully to business needs.” (Participant 1, 2018-04-16) |
| Software testing | Yes | Software testing is important to check if the system is operating correctly and that the data within the system is good. By testing, issues that could affect the business operation can be identified. | Participant 1, 2 | “Testing is important to check that processes are working as they should.”  
( Participant 2, 2018-04-17)  
“To see that we have good data in the system.”  
( Participant 2, 2018-04-17)  
“Make sure that everyone are testing the processes that they have accessible in the daily work. Make sure to test everything to see that everything is operating as it should. Test real life scenarios.”  
( Participant 2, 2018-04-17)  
“Because then we can see if there are some issues. It leads to business
The testing should be performed by everyone in the organization where the testing should be covering the processes of the company using real-life scenarios. 

<table>
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<tr>
<th>Performance measurement</th>
<th>Yes</th>
<th>It is important to decide on what KPIs to be measured and to have experienced people in the team that understands the progress so that things are done in the right order and in the right way.</th>
<th>Participant 1</th>
<th>“It is important to decide what KPIs to set.” (Participant 1, 2018-04-16)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education and training</td>
<td>Yes</td>
<td>Training is important to develop an understanding of the system and its processes so that the users can identify errors and correct these. It is good to conduct training early in the process and go through how specific tasks will be handled in the system for the users to be more confident operating the system.</td>
<td>Participant 1, 2</td>
<td>&quot;But I think that you can never have too much training as early as possible.” (Participant 2, 2018-04-17)</td>
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<td>&quot;In order for people to do their job so that the processes are flowing smoothly.” (Participant 2, 2018-04-17)</td>
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<td>&quot;Because people learn the processes quite easily in the end but often the flow disrupts somewhere due to the master data being wrong and then you have to be able to understand how to fix it and know what is correct.” (Participant 2, 2018-04-17)</td>
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<td></td>
<td>“Because otherwise there might be big confusion and it might not be able to be solved. Some specific tasks might not be thought through to be handled in the system.” (Participant 1, 2018-04-16)</td>
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<td>“The end-user training should be giving confidence enough and skills to handle the system. How to tackle problems using case studies. In our case only perfect world cases were presented but not how to solve problems.” (Participant 1, 2018-04-16)</td>
</tr>
<tr>
<td>Technical possibilities</td>
<td>Yes</td>
<td>The ERP system should be gone through using scenarios to see how the functions correspond to the business of the company and what the gaps of the specific software are to understand what workarounds that might be needed.</td>
<td>Participant 1</td>
<td>“Because otherwise the functions will not correspond to the business. The people might need to create workarounds.” (Participant 1, 2018-04-16) “Address the gaps.” (Participant 1, 2018-04-16) “I think that there should be some walkthroughs with the current solution with some scenarios and reporting to be done.” (Participant 1, 2018-04-16)</td>
</tr>
</tbody>
</table>

### Appendix D - Within-case phases - B 1

<table>
<thead>
<tr>
<th>Critical success factors</th>
<th>Phase/Phases</th>
<th>Description</th>
<th>Source</th>
<th>Quote</th>
</tr>
</thead>
</table>

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<table>
<thead>
<tr>
<th>Role</th>
<th>Phase</th>
<th>Description</th>
<th>Participant 1,2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project team</td>
<td>All phases</td>
<td>The project team is important in the implementation and post-implementation phase, wherein the post-implementation phase potential issues have to be fixed by the team.</td>
<td>&quot;Crucial in both implementation and also in post implementation. I would say the real work start afterwards because a lot of issues comes up in the post implementation that must be fixed.&quot; (Participant 1, 2018-04-16) &quot;Throughout the entire implementation. After you have implemented the system, the project team is still important because there is still some things that needs to be fixed and you cannot drop everything just because the system are live” (Participant 2, 2018-04-17)</td>
</tr>
<tr>
<td>Top management involvement</td>
<td>All phases</td>
<td>Top management involvement is important in the pre-implementation, and implementation phase as the management must be involved and take critical decisions.</td>
<td>&quot;Very important all the way but especially in pre implementation, but top management must be involved always and be there to take critical decisions&quot; (Participant 1, 2018-04-16) &quot;Probably before and during the implementation.&quot; (Participant 2, 2018-04-17)</td>
</tr>
<tr>
<td>Strategic decision-making</td>
<td>Pre-implementation</td>
<td>Strategic decision-making is essential in the pre-implementation phase as it is in this phase important implementation strategies must be discussed and planned.</td>
<td>“Before and after the implementation.” (Participant 1, 2018-04-16) “Probably before the implementation because it is here the important strategies of the implementation must be discussed and planned.” (Participant 2, 2018-04-17)</td>
</tr>
<tr>
<td>Category</td>
<td>Phase</td>
<td>Description</td>
<td>Participant(s)</td>
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<tr>
<td>Communication</td>
<td>All phases</td>
<td>Communication is vital in all phases of the implementation. In the pre-implementation phase, it is essential to inform the employees about what is going on. In the implementation phase, it is essential to keep everyone updated sharing valuable information. Lastly, it is important in the post-implementation where learnings and follow-ups on the project can be shared.</td>
<td>Participant 1,2</td>
</tr>
<tr>
<td></td>
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<td>“Throughout the entire implementation, information must be communicated to the departments on how the project is progressing and communicate important milestones.” (Participant 1, 2018-04-16)</td>
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<td></td>
<td>“Throughout the entire implementation. Before the implementation in order to explain to the employees regarding what will happen and during the implementation the project in order to keep everyone updated and communicate important information to them, and afterwards as well where you can explain different learnings and follow up how the project progressed.” (Participant 2, 2018-04-17)</td>
</tr>
<tr>
<td>Project management</td>
<td>All phases</td>
<td>Project management is important in the pre-implementation and implementation phases.</td>
<td>Participant 1,2</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>“Throughout the entire implementation.” (Participant 1, 2018-04-16)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>“Before and during the implementation.” (Participant 2, 2018-04-17)</td>
</tr>
<tr>
<td>Project support</td>
<td>All phases</td>
<td>Project support is important in the implementation phase to have support present that can assist in critical moments.</td>
<td>Participant 1,2</td>
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<tr>
<td></td>
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<td></td>
<td>“In the implementation phase.” (Participant 1, 2018-04-16)</td>
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<td></td>
<td>“Throughout the entire implementation. And also under go live it is important to have support that can be there and help us in critical moments.” (Participant 2, 2018-04-17)</td>
</tr>
<tr>
<td>Minimum customization</td>
<td>Pre-implementation</td>
<td>Minimum customization is important in the pre-implementation phase.</td>
<td>Participant 1,2</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>“Pre-implementation.” (Participant 1, 2018-04-16)</td>
</tr>
<tr>
<td>Organizational change management</td>
<td>All phases</td>
<td>Change management is essential in all phases of the implementation. In the pre-implementation, it is essential since justification of why the new ERP is needed should be shared whereas in the rest of the project there should be continuous follow-ups to involve the employees.</td>
<td>Participant 1,2</td>
</tr>
<tr>
<td>Business process alignment</td>
<td>Pre-implementation</td>
<td>Business process alignment is essential in the pre-implementation phase as it is in this phase evaluation of current processes and how they can be matched with the system is taking place.</td>
<td>Participant 1,2</td>
</tr>
<tr>
<td>Software testing</td>
<td>Pre-implementation, implementation</td>
<td>Software testing is important in the pre-implementation and implementation phase. In the implementation phase, it is important to test all the processes and check, so they function correctly before going live.</td>
<td>Participant 1,2</td>
</tr>
<tr>
<td>Topic</td>
<td>Phase</td>
<td>Description</td>
<td>Participant(s)</td>
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</tbody>
</table>
| Performance        | Implementation, Post-implementation | Performance measurement is important in the implementation and post-implementation phases. In the post-implementation phase, it is important to measure the performance and compare it to the starting point. | Participant 1,2                                                              | "In implementation but especially in post implementation." (Participant 1, 2018-04-16)  
"If you want to compare how it was before and how it is now you must have some performance measured in the pre implementation phase and when the new system is up and running in the post implementation phase measure the performance again." (Participant 2, 2018-04-17) |
| Education and      | Implementation, Post-implementation | Education and training are important in the implementation and post-implementation phases. In the post-implementation, it is important to follow up and provide additional training if needed, especially when there are new updates. | Participant 1,2                                                              | "Implementation and in post implementation due to new updates that might come and these updates might require further education.” (Participant 1, 2018-04-16)  
“Throughout the entire implementation. Important to follow up afterwards with the employees and provide more training if needed, especially when there are new updates.” (Participant 2, 2018-04-17) |
| Technical          | Pre-implementation   | Technical possibilities are important in the pre-implementation phase.                                                                                                                                     | Participant 1,2                                                              | "Pre-implementation and during the implementation.” (Participant 1, 2018-04-16)  
“Before the implementation.” (Participant 2, 2018-04-17) |


### Appendix E: Within-case analysis- C 1

<table>
<thead>
<tr>
<th>Critical success factors</th>
<th>Important (Yes/No)</th>
<th>Description</th>
<th>Sources</th>
<th>Quotes</th>
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</thead>
<tbody>
<tr>
<td>Project team</td>
<td>Yes</td>
<td>For an ERP implementation to succeed, the project team must consist of people who have been involved in similar projects, and that knows what is needed. Furthermore, the project team must include at least one representative from each department within the organization, have a common understanding and be synchronized where everyone is working towards the same goals. A project leader who has more knowledge can be important since it is a person that are leading the project as well as being a person that the users can trust.</td>
<td>Participant 1,2,3</td>
<td>“In order for the project to succeed it is important to have someone who have been involved in similar projects and knows what is required” (Participant 1, 2018-04-05) “In every project its vital that at least one person from each department is involved” (Participant 1, 2018-04-05) “You have someone who has more knowledge and that is why a project leader can be important. Someone who leads the project and someone who the users can trust” (Participant 2, 2018-04-11) “Regarding project teams, synchronization and understanding for each other is very important so that each department do not drive their own race and instead have an understanding that something might be important in another department” (Participant 3, 2018-04-16)</td>
</tr>
<tr>
<td>Top management involvement</td>
<td>Yes</td>
<td>The top management must be involved in terms of taking decisions on the critical parts and must understand the complexity of an ERP project and that it is something that takes time. Furthermore, the top management must depose</td>
<td>Participant 1,2,3</td>
<td>“Decision on the critical parts were totally in the top management hands.” (Participant 1, 2018-04-05) “They must understand that this is something that takes time, have patient and understand that we might encounter barriers during the project” (Participant 2, 2018-04-11) “They must take difficult decisions in which direction we want to go, perhaps dump something in the project in order...” (Participant 3, 2018-04-16)</td>
</tr>
</tbody>
</table>
| **Strategic decision-making** | Yes | A strategy with clear goals and a timeline can be of considerable assistance for the employees. Since a clear strategy and business plan enables the employees to see the benefits of the project, especially when some employees might not have experienced an ERP implementation. The timeline must include a go-live date as well as a justification of the project where the benefits of the new system will be explained. | Participant 1,2,3 | “When you have a clear strategy, it enables the user to better understand how we are going to work and how it’s supposed to be. A strategy is important especially for an unexperienced user who have not been involved in previous implementations.” (Participant 1, 2018-04-05)  
”The strategy must display a timeline for how the project is planned. This gives a clearer understanding for the user” (Participant 2, 2018-04-11)  
”The strategy must contain a timeline involving the go-live date and also include why we are doing this implementation and justify what the changes will result in. Which benefits will I have with the new system must be explained in the strategy” (Participant 3, 2018-04-16) |
| **Communication** | Yes | Communication is important for the employees to create an understanding and to feel involved in the project. By communicating in a shared forum, everyone can access the information. Information on how the project is progressing should also be communicated down to the organization throughout the entire project which would also | Participant 1,2,3 | “Instead of us repeatedly report problems to the management, we would use forums where we could communicate to each other and report bugs so that everyone could see them” (Participant 1, 2018-04-05)  
“I think that the user appreciate when information regarding how the project is progressing is communicated to them as they might feel more participation” (Participant 2, 2018-04-11)  
”Even though everyone is not part of the implementation project, communication inside the organization might |
| Project management | Yes | Project management is critical when implementing an ERP system as someone is leading the project and knows what should be done. A strong sense of prioritization is needed since the most critical processes have to be assessed to understand what is most important. | Participant 2,3 | “Without a well working project management you might risk the project being quite disordered and impose pointless energy on parts that is not relevant for the moment. That is what project management is all about”. (Participant 3, 2018-04-16) “The has to be a strong sense of prioritization. Often you have many processes and then you are not prioritizing them correctly. Assess what is most critical for the business since you then get more critical of what is actually most important.” (Participant 2, 2018-04-11) |
| Project support | Yes | The project should be supported in terms of having experienced and knowledgeable consultants available. ERP implementations are complicated projects, and the consultants must be able to provide solutions and have an ability to solve issues swiftly. It is also important that the consultants are located close to the organization and speak the same language. | Participant 1,2,3 | “We were lucky to have consultants with knowledge and expertise.” (Participant 1, 2018-04-05) “We have had ERP system developers who have been of great assistance in providing solutions to specific issues along the way.” (Participant 2, 2018-04-11) “We had the advantage of having our ERP suppliers located close to us, who could be here swiftly. Moreover, having consultants who speaks Swedish is one of the advantages I rate incredibly valuable”. (Participant 3, 2018-04-16) “Previous ERP implementation projects I have been part of that have failed, it came consultants from England and USA which was a large challenge. They will need to learn our business processes and we have to understand their
| Minimum customization | Yes | Too much customization of the ERP system can result in issues in the long term as the advanced unique solutions that have been customized have to be managed. Furthermore, the vendor might not be familiar with the customizations compared to the standard solution which in comparison can lead to swifter aid. | Participant 2,3 | “Those processes that have been customized have also been where we have had most problems as the more advanced business unique solutions are required to be managed” (Participant 2, 2018-04-11) "If you have customizations of the system, the vendor might not be completely familiar compared to the standard solution. If a standard solution is implemented, you can acquire assistance much faster.” (Participant 3, 2018-04-16) |
| Organizational change management | Yes | Change management is important to reduce resistance and to make the employees understand the benefits of the new system for the entire organization. The employees need to be informed regarding the change and why it is needed. The top management must inform the users about the change and explain how it will | Participant 1,2,3 | “The top management must persuade the employees in order to reduce resistance and sell the new change so that they understand why it is needed and what benefits the organization can achieve with the new system.” (Participant 1, 2018-04-05) “To get the users to understand why a new system is necessary.” (Participant 2, 2018-04-11) "The employees must be informed on how the change will affect them and this needs to happen early. Some might
<table>
<thead>
<tr>
<th>Area</th>
<th>Involvement</th>
<th>Description</th>
<th>Participant(s)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business process alignment</td>
<td>Yes</td>
<td>Matching the business processes with the ERP system is crucial as it enables the system to manage everything the company needs so that essential functionality is kept. The processes must be documented as it facilitates clarity and decreases the risk of things going missing. It is important to understand that the system must be selected with the business processes in mind. However, the organization must also customize its processes to fit the ERP system.</td>
<td>Participant 1, 2, 3</td>
<td>“The reason I believe it’s important with matching the processes with the system is because the ERP system needs to be able to manage everything that the company needs so that important functions doesn’t disappear.” (Participant 1, 2018-04-05)</td>
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<td>“The ERP is built up after a certain logic and has not always been fully matched with the company’s. I believe we should have adjusted our processes more by how the ERP system is working.” (Participant 2, 2018-04-11)</td>
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<td>“When you have you processes mapped eases visibility and you can clearer see how the exact flow is. The more processes you have documented decreases the probability of missing out on things.” (Participant 3, 2018-04-16)</td>
</tr>
<tr>
<td>Software testing</td>
<td>Yes</td>
<td>Software testing is vital to assure a safe ERP solution and to avoid unpleasant surprises when the system is live. Testing the system is important to have less complexity after going live. By running correct testing, it allows the organization to identify possible errors, and it can make the user more comfortable with the ERP.</td>
<td>Participant 1, 2, 3</td>
<td>“I believe testing is a very important part of the implementation project in order to reduce complexity during post-implementation.” (Participant 1, 2018-04-05)</td>
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<td>“It is in the testing you can see how the flow is and also see possible errors. By conducting accurate testing of the system it allows you to be more comfortable with the ERP.” (Participant 2, 2018-04-11)</td>
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<td>“Software testing allows you to feel safe with the solution without any surprises when you are going live. By having scenarios is a good way to the test the system and the tests” (Participant 3, 2018-04-16)</td>
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</table>
the system. The tests have to be conducted in a detailed step-by-step manner, and the use of scenarios is a good way of doing this.

<table>
<thead>
<tr>
<th>Performance measurement</th>
<th>Yes</th>
<th>Performance must be measured for the daily work to function as it should. It is important to measure the performance to see if the organization can manage its processes. It is essential that tasks do not take too long time which means that functions that are taking a long time have to be streamlined as it otherwise might disrupt the daily operations.</th>
<th>Participant 1,3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>“We tested the system in the way we believed that we would use it in reality and those functions we used in a daily business was measured frequently.” (Participant 1, 2018-04-05)</td>
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<td>”It cannot take 10 minutes for the service desk to search for a customer, that must happen in shorter than 15 seconds. It is not sustainable to work in a system that disturbs your daily work.” (Participant 3, 2018-04-16)</td>
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<table>
<thead>
<tr>
<th>Education and training</th>
<th>Yes</th>
<th>Training and education are essential to reduce insecurity and to make the user feel more comfortable operating the system. System training allows the user to understand how the system functions and reduce dependability once the system is live. Moreover, training allows the user to start working independently when the system is rolled out. It is essential to have an understanding of the worries</th>
<th>Participant 1,2,3</th>
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<tbody>
<tr>
<td></td>
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<td>“By having recorded material and maybe having power point presentations were the functions are showed step-by-step could have eased the training of the system.” (Participant 1, 2018-04-05)</td>
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<td>”Training can decrease worries and by repeatedly offering training allows the user to be more comfortable, understand the system and recognize it when the system is live.” (Participant 2, 2018-04-11)</td>
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<td></td>
<td></td>
<td>”In order to minimize doubts and fears. If the user knows that he need to do eases the daily routines and can be more independent.” (Participant 3, 2018-04-16)</td>
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</table>
some users might feel and to provide step-by-step training would make the training more straightforward to understand.

<table>
<thead>
<tr>
<th>Technical possibilities</th>
<th>Yes</th>
<th>The technical possibilities an ERP system can provide is important to develop processes that require system support and to increase the efficiency. The technical possibilities must be on the same level as the business processes of the company.</th>
<th>Participant 1,2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>“I believe that technical possibilities are important in order to develop things that requires system support in order to be more efficient and give new functions out to the consumers.” (Participant 1, 2018-04-05)</td>
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<tr>
<td></td>
<td></td>
<td>”The technical possibilities must be well in phase with the company’s processes and how you work. (Participant 2, 2018-04-11)</td>
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<tr>
<td>Critical success factors</td>
<td>Phase/Phases</td>
<td>Description</td>
<td>Source</td>
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<tr>
<td>Project team</td>
<td>All phases</td>
<td>The project team is important throughout the entire implementation project. In pre-implementation phase, the project team will work a lot with the pilot study and in post-implementation phase as well as it might come up some critical decisions to manage.</td>
<td>Participant 1</td>
</tr>
<tr>
<td>Top management involvement</td>
<td>All phases</td>
<td>The top management should be involved throughout the entire ERP implementation project as they must have an understanding for how the project is progressing and also be there to help the project team when the big decisions are taken.</td>
<td>Participant 1</td>
</tr>
<tr>
<td>Strategic decision-making</td>
<td>Pre-implementation</td>
<td>Before the implementation for the entire organization to have an understanding of the projected goals.</td>
<td>Participant 1</td>
</tr>
<tr>
<td>Category</td>
<td>Phase</td>
<td>Description</td>
<td>Participant(s)</td>
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<tr>
<td>Communication</td>
<td>All phases</td>
<td>Communication is highly crucial throughout the entire communication as it enables visibility and decreases confusion. In the post-implementation, the operational user might feel a shock, especially if the system is not fully ready or when new updates and solutions to system derive.</td>
<td>Participant 1,2</td>
</tr>
<tr>
<td>Project management</td>
<td>Pre-implementation</td>
<td>During the implementation when the organization must evaluate which parts of the project that needs more work, which parts must be prioritized.</td>
<td>Participant 2</td>
</tr>
</tbody>
</table>

In the post-implementation, the system user might feel a shock, especially if the system is not fully ready or when new updates and solutions to system derive. "Important throughout the entire project. But especially important post implementation. It can sometimes be shock for the users as the new system isn’t completely ready and new updates and solutions to the system can follow. You have to communicate these sorts of thing post implementation." (Participant 1, 2018-04-05)

"During the implementation when you are evaluating which parts of the project that needs more work, which parts must be prioritized and so forth." (Participant 2, 2018-04-11)
<table>
<thead>
<tr>
<th>Project support</th>
<th>All phases</th>
<th>Project support is essential throughout the entire project as knowledgeable consultants can aid during the go-live period and also be there to help the operational users.</th>
<th>Participant 1,2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>&quot;Support must be provided to the employees before, during and after the implementation. In order to go live and to complete the ERP implementation, support must be provided to the users.&quot; (Participant 1, 2018-04-05) &quot;Project support is important throughout the entire project as knowledgeable consultants can aid during the go-live period and also be there to help the system users.&quot; (Participant 2, 2018-04-11)</td>
<td></td>
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<tr>
<td>Minimum customization</td>
<td>Pre-implementation</td>
<td>Minimum customization is important in the pre-implementation phase when the pilot study is completed. Customizations must be determined early in the project to eliminate difficulties later.</td>
<td>Participant 2</td>
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<td>&quot;My experience for the project is to not to a lot of customizations in the start of the project. But in some cases, customizations must be done and these customizations must in those cases be in the beginning of the project. I would say that the customizations must be determined early so you don't have to do them later but must also be flexible as you might find that you must customizations later that you had not encountered.&quot; (Participant 2, 2018-04-11)</td>
<td></td>
</tr>
<tr>
<td>Organizational change management</td>
<td>All phases</td>
<td>Change management must be managed throughout the entire project as the employees must that they are participating and feel involved. The employees learn at a different speed and to minimize confusion or resistance, change management must be available until everyone feels safe with the change.</td>
<td>Participant 1,2</td>
</tr>
<tr>
<td>Business process alignment</td>
<td>Implementation</td>
<td>Business process alignment is important in the implementation phase as well as in the post-implementation phase. It is first during the implementation the processes in the system are shown and can see how they are responding in practice, and post-implementation is also important because it is in this phase the organization can see if the business processes are matching with the system and can modify if needed.</td>
<td>Participant 1,2,3</td>
</tr>
<tr>
<td>Software testing</td>
<td>Implementation, post implementation</td>
<td>Software testing is important in the implementation phase and the post-implementation phase. It is first in the implementation phase, before going live that the testing can take place as the organization can see how the system is reacting when operating. In the post-implementation phase, testing of the system is important when new updates must be tested.</td>
<td>Participant 2,3</td>
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<tr>
<td>Performance</td>
<td>Implementation, post implementation</td>
<td>In the implementation phase as well as in the post-implementation phase is when the organization can first measure its performances.</td>
<td>Participant 2</td>
</tr>
<tr>
<td>measurement</td>
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<tr>
<td>Education and</td>
<td>Implementation, post implementation</td>
<td>In the implementation phase as well as in the post-implementation phase. If training is provided to early will only lead to confusion and people will forget it. It must be conducted just before go-live.</td>
<td>Participant 1</td>
</tr>
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<td>training</td>
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<tr>
<td>Technical</td>
<td>Pre-implementation</td>
<td>In the pre-implementation phase, as the technical possibilities the system can offer must be examined when choosing the ERP. Moreover, the technical possibilities must as well be developed continuously to remain competitive.</td>
<td>Participant 1</td>
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<td>possibilities</td>
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