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Leading change in technological transformation: implementation of new Enterprise Resource Planning system

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Abstract

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This Master's thesis examined the implementation of a new enterprise resource planning system in the case company and aimed to develop a change management model which can be utilised for similar technological changes. The theoretical framework focused on the change management literature, from which two change management theories were chosen for this study. Based on these two theories, a new change management model was created. The model combined the main steps of the two change management theories and was applied to be suitable for technological change. The research aimed to determine which methods were most effective in technological transformation and whether the change management model developed could be applied to similar technological changes.

The model was observed and tested at the case company, where a qualitative interview was conducted. The interview questions were based on the model and related to user habits, implementation process, deployment of the new ERP and interest in trainings. The interview results were qualitatively analysed, after which a second and final version of the change model was created. The research was conducted from the perspective of an involved employee, where the researcher was part of the implementation project.

As a result, a new change management model was created which the study supports. The outcome of the study highlights the importance of proper change management plan and communication in the organization. The case company received suggestions with regard to utilising the new model, as well as development ideas for similar technological changes in the near future.

Keywords
Change management, technological change, change models, enterprise resource planning system

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1 Introduction

The goal of this development project was to follow the implementation of a new enterprise resource planning (ERP) system and prepare a change management model which is applicable to similar technological changes. The study examined the needs assessment of both previous and new ERP systems and followed the transition process between the previous and new software. The development project aimed to ensure a successful deployment of the new ERP system and facilitate the transition to new software.

The development project focused on implementing a new change management model for the case company. The model is based on two change management theories that are handled in this report while concentrating for changes in technological transformation. The model was tested by observations during the ERP implementation as well as tested in the case company where a qualitative interview was conducted.

Chapter 1 of this thesis introduces the research outline, objectives, research questions, case company and research methodology. Chapter 2 is a literature review which explains the selected change management theories and introduces the ERP system of the case company and its needs assessment of the software. Chapter 3 outlines the methods and interview framework used in this research. Chapter 4 presents the results of the interviews and main observations, followed by research analysis in Chapter 5. Chapter 6 presents a summary and offers development suggestions for the case company.

1.1 Relevance of topic

This research is needed because the company requires a proper ERP system to operate fully. It is also important for development purposes, as a new ERP system allows for more flexible operations, such as additional tools and systems. The main criterion for the new ERP is its configurability, as the company is using custom-made solutions in its daily operations. The new ERP must also offer advantages for daily users (e.g., employees) to encourage users to learn the new program. (Pelphrey 2015, 25–26).

The expected value contribution for the company is considerable. An updated version of the ERP is necessary, and it is a major investment for the company. In the long term, the company will benefit from this investment, as it provides new technology that allows for faster and more efficient daily operations. The potential gains of successfully implementing technologically based change are many and varied. The potential gains from this development process include:

- Achieving flexible working methods and functions
- Serving customers in new ways
- Achieving sophisticated functionality at reasonable cost
- Producing better information with a greater level of detail
- Increasing the value of skills and knowledge by sharing information

The timeline below illustrates the combination of the ERP project and this study (see Figure 1).

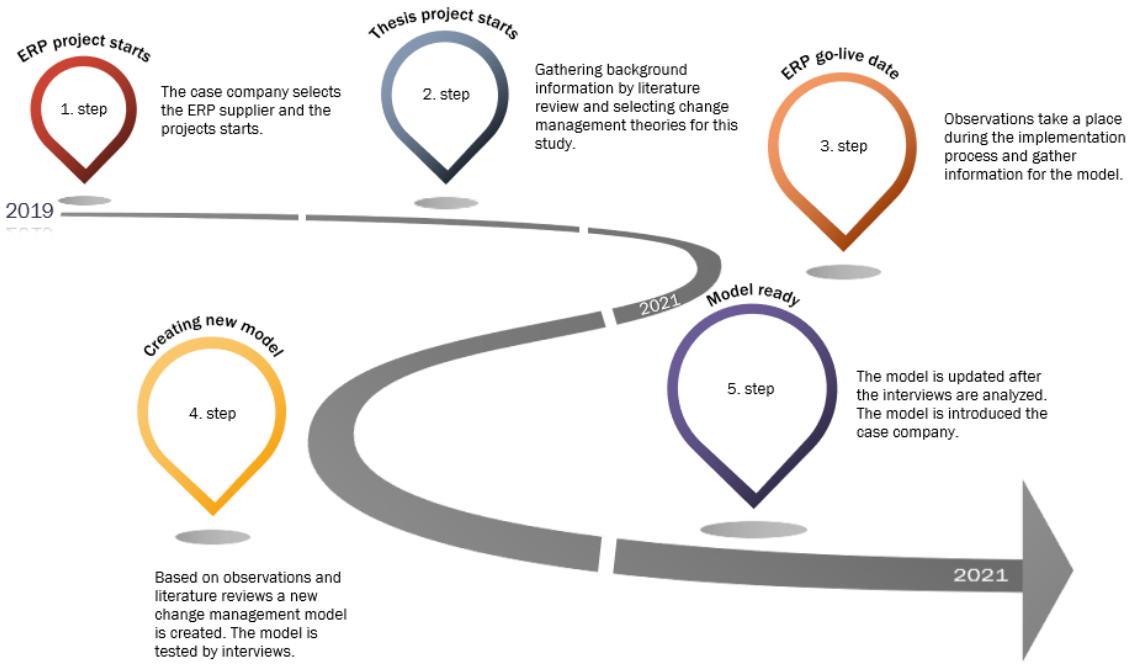

Figure 1. Study timeline.

The company was forced to update its existing ERP system because the current version no longer provided updates. The case company decided to continue with the same system provider and update their ERP to a newer version. Because their previous ERP system had not been updated for the past decade, the company had to skip the previous four versions and transition to the newest version. The new version of the ERP allowed the case company to use the system remotely, which had not been possible with their previous system. It also provided new tools and transactions for daily users. The researcher was part of the operation team, and her role was to concentrate on the ERP implementation and deployment and make suggestions for the future actions.

1.2 Objectives

The main objective of this study was to develop a model for a technological change and follow the implementation of ERP project. The study aimed to develop a new model that

the case company could utilise for similar technological changes. The objective was closely linked to both the development project perspective and the research perspective. The study aimed to determine which methods were the most effective in technological transformation and whether the change management model developed could be applied to similar technological changes. The research was conducted from the perspective of an involved employee, as the researcher was part of the transformation project.

The research process started in early 2020 and continued until spring 2021. The board members of the company approved the initialisation of new ERP. The transition process took approximately one year. The preliminary target date for the new ERP to go live was February 2020. The researcher worked as a project manager and reported to the financial manager and managing director. The project research is divided into four phases:

1) Review change management literature and create model to be examined
2) Implementation of new ERP version, applying the change management model
3) Finalisation of the ERP project
4) Updating the created change management model

The main research method was qualitative interviews that were supported by observations during the implementation process. The main literature was gathered from relative change management theories to create value and support for the research methods. Part of the research data was provided by the case company. The research methodology is explained further in Chapter 3.

1.3 Research problems and question

The aim of this research was to examine what change management factors were most effective in successful technological transformation. The research is based on Kotter's and Bridge's change management theories; the researcher developed a change management model which was tested in the interviews. The research question and its sub-questions were as follows:

1. What kind of change management model can be applied to technological change?
    a. What factors are most effective in a successful ERP transition?
    b. What are the conclusions of the existing change management literature?
    c. What can be learned from this model?

1.4 Case company

The case company is a Finnish, family-owned importing company which celebrated their seventieth anniversary in 2019. The company was established in 1949 by air force pilots who supplied airplane spare parts. Today, the case company is a large-scale importing company operating in the third generation. The company has two subsidiaries, one in Finland and one in Estonia. The case company's product range is divided into five main

groups: building materials, technical insulation materials, indoor, technics, and petrochemistry products.

The case company has approximately 50 personnel and is financially stable. The company works with over 500 hardware stores in Finland, including organisations such as Kesko, SOK and Bauhaus. As a family-owned company, the company is devoted to serving its customers and building long-term customer relationships. Last year, the company's turnover was approximately 25 million euros. The case company is currently in transition as the second generation nears retirement age and the company is forced to make major internal changes to continue its operations.

The ERP implementation project was analysed based on actions conducted in spring 2020. The research aimed to provide suggestions and ideas related to immediate and future changes in the company. The suggestions were based on a change management model and seven qualitative interviews and are detailed in Chapter 6.

2 Change management

2.1 The need for a change

Change is difficult. According to research by McKinsey and Company, nearly 70 % of all changes in organisations fail. When changes fail, people often become cynical. Therefore, management is often challenged to motivate staff who believe that the project will fail despite their work. According to research by IBM, the need to lead change is growing, but companies' ability to do so has reduced (Maurer 2010).

According to Ashkenas (2013), the co-author of the Harvard Business Review Leader's Handbook, the content of change management is reasonably correct, but the managerial capacity to implement it has been woefully underdeveloped. Change management is often outsourced to human recourse specialists rather being the responsibility of managers. Effective implementation of the change requires the following three factors:

1) A common set of definitions, approaches and checklists with which everyone is familiar (e.g., tools, frameworks)
2) Change management which is part of the business plan, as opposed to an individual add-on that is independently managed
3) Change leaders (i.e., managers, experts or individual employees) who are accountable for ensuring that the change happens systematically (Ashkenas, 2013)

Many people resist change because it challenges their day-to-day work life. According to Sloan Management Review's global research by Massachusetts Institute of Technology, digitally savvy executives align their people, processes and cultures to achieve long-term digital success for their organisations. Nearly 90 % of managers and executives responded that their organisations would be disrupted by digital trends to a great or moderate extent. However, only 44 % of respondents stated that their organisations are effectively preparing for the coming disruptions. Having a digitally effective culture requires conscious effort; according to the survey, nearly 80 % of digitally maturing companies stated that their organisations are dynamically engaged in efforts to reinforce agility, take risks and collaborate, whereas only 23 % of organisations in the early stages of digital development are doing so. Digitally maturing companies invest in their own talent; over 75 % of respondents reported that they offer resources and opportunities to develop digital acumen, whereas 14 % of early-stage companies announced plans to do so. When everyone in the organisation realises that anyone can be a change agent, a meaningful change will occur. Transformation is a shared responsibility (MIT SMR 2018).

2.1.1 Change management models

Gareth Morgan's (1986) work on organisational metaphors is a valid starting point for understanding the existing beliefs and assumptions about change:

> *Metaphor gives us the opportunity to stretch our thinking and deepen our understanding, thereby allowing us to see things in new ways and act in new ways… Metaphor always creates distortions too… We have to accept that any theory or perspective that we bring to the study of organisation and management, while capable of creating valuable insights, is also incomplete, biased, and potentially misleading* (Morgan 1986).

Morgan introduces eight metaphors, from which four are chosen to handle more deeply in this research. These four metaphors are most often seen to appear by managers to provide useful insight about organisational change. These four metaphors are organisations as machines, organisations as political systems, organisations as organisms and organisations as flux and transformation

Organisations as machines

The machine metaphor is widely used when examining organisational changes. It represents organisations as rational and structured enterprises to achieve predetermined goals. This idea of an enterprise implies routine operations, efficient working methods, clear structure and job roles. Work procedures are clearly defined when standards and rules are followed. This metaphor works well in situation where stable, routine tasks are executed. However, in situations where major change is needed, this approach is seen and experienced by employees as a major overhaul and is likely to cause disruption and resistance. Therefore, change can be difficult to face with these kinds of assumptions and is unlikely to succeed. This metaphor requires inspirational vision, strong management skills and control from the top down.

Organisations as political systems

The political system metaphor expresses the importance of power play, conflicts and competing interests that are faced in organisational life. The disadvantage of this metaphor is unnecessary development strategies as the metaphor assumes any organisational effort involves winners and losers. This can create competing and conflictual power struggles in organisational life.

Organisations as organism

The organism metaphor represents the organisation as a living system which is able to adapt and respond to environmental conditions. In this metaphor, the organisation balances the needs of groups and individuals with the requirements of the environment. This approach implies that having a healthy approach to the outside world reflects a healthy organisational ecosystem, where different species of organisations exist.

Organisations as flux and transformation

The flux and transformation metaphor represents organisations as self-producing systems. This approach forces organisations to constantly experience transformation, as it is an ever-changing system that is able to self-renew. It represents organisations where life is not governed by rules of cause (Cameron et al. 2015).

2.1.2 John Kotter, eight-step model

John Kotter introduced his eight steps to transforming an organisation in 1995. Kotter's model is based on his analysis over 100 organisations which have gone through a change. His research highlighted eight key lessons which he transformed into an eight-step model. The model was updated in 2014 into a 'leading change' version (see Figure 2). Kotter's model introduces issues around making a change happen and highlights the importance of individual feelings as well as communication, which play a key role throughout the change (Kotter Inc 2021).

Figure 2. Kotter's new 8 step model.

Every change begins from the willingness to change. Awareness of the change improves the possibility of achieving successful results. The main issue with all changes is the need to achieve a genuine willingness to change. It is the first step in the chain of action that is needed to succeed in the changing world.

1. **Create a sense of urgency**. Companies who succeed in making changes first ensure that enough people in the organisation understand the need for the change, feel compelled to identify important opportunities and threats and want to act here and now.

2. **Build a powerful guiding coalition.** When the sense of urgency is strong, people are able to quickly identify which issues are critical and to assemble strong, committed teams who are capable of implementing ambitious change projects.

3. **Form a strategic vision and initiatives.** Companies need to make their vision clear and easy to understand for everyone. They need to clarify how it will be different and how initiatives are linked directly to the vision.

4. **Enlist a volunteer army.** Teams which genuinely need change actively communicate their vision and strategy to people; the goal is to engage a large number of people who will spread the willingness to make the change.

5. **Enable action by removing barriers.** Change leaders who are driven by the genuine desire for the change give other people committed to change the decision-making power and opportunities to influence in order to achieve the common vision by removing inefficient processes and hierarchies.

6. **Generate short-term wins.** Change-positive teams guide empowered people to achieve visible and clear short-term results. Short-term wins must be recognised from the beginning and often in order to track progress and disarm cynics.

7. **Sustain acceleration.** Even after a successful start, the change-positive team does not allow the organisation to return to complacency. Action is increased and focused on each stage of the overall challenge. Change is not abandoned until the vision has become a reality.

8. **Institute change.** Organisations which are driven by a willingness to change understand the importance of ensuring the permanence of the change. This is done by institutionalising the change, for example by linking the change and its consequences to the organisation's structures, systems and operating culture.

The rapidly changing world offers new opportunities and possibilities. This is part of the basic essence of changing operating environments. Taking advantage of these opportunities requires several skills and resources. However, it starts with creating change willingness and awareness to a sufficient number of key persons (Kotter Inc 2021).

2.1.3 William Bridges, transition model

William Bridges' transition model helps organisations and individuals understand the personal and human side of change (see Figure 3). The model helps effectively manage and work through to change, and it is divided into three stages that the individual experiences during the change:

1) Ending the current situation
2) The neutral zone
3) The new beginnings

Bridges' model has been widely used by leaders and managers for more than 30 years.

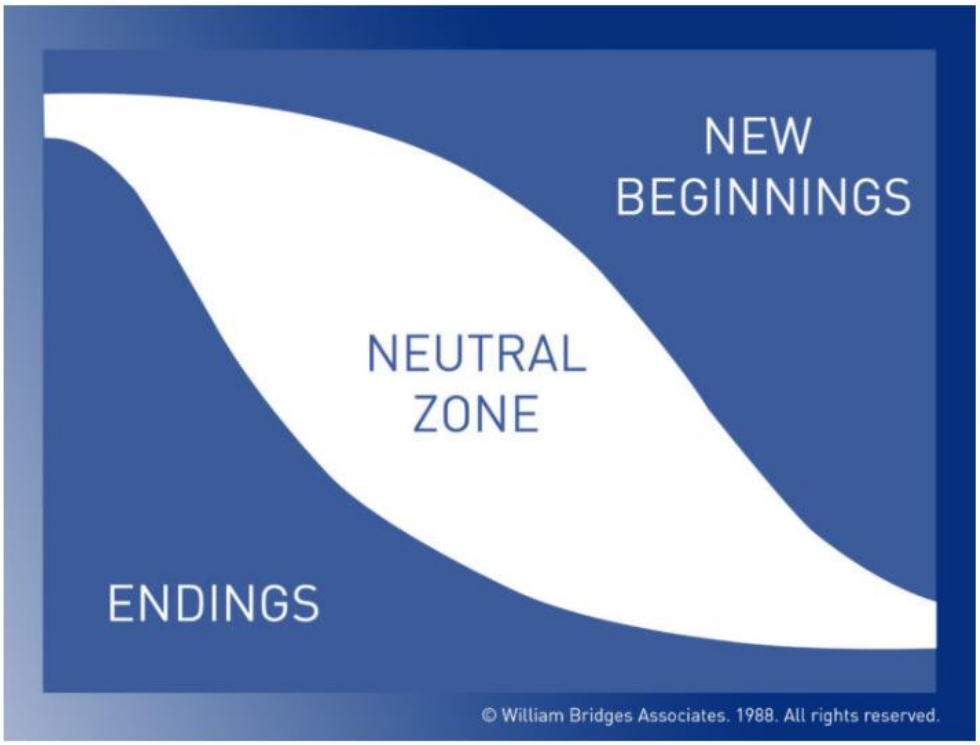

Figure 3. Bridge's transition model 1.

Bridges explains that there is a clear distinction between a planned change and a transition. A change is an exterior event or condition such as a new business strategy, a merger, a new product or service or turnover of leadership. Organisations focus on the desired outcomes of the change, which are usually in response to external events. In these cases, the change can occur quickly.

Transition, on the other hand, is an inner psychological process that individuals go through during the change as they internalise and adapt to the new situation. In certain cases, people experience crises during the change process due to the transition and empathetic leaders are key in these kind of situations. Transitions do not focus on the outcome; on the contrary, they focus on the ending of the former situation. Where there is change, there is transition. This leads to following equation:

change + human beings = transition

People cannot avoid change, but they can manage it. To succeed in change, it must be managed. It is certain that whatever currently exists will change. It is thus important to manage transitions (Bridges 2009, 4–6). A successful change is only possible if organisations and leaders manage the transition that individuals experience during the change. Leaders should guide the way through the change by supporting individuals rather than pushing forward. By doing so, organisations have the opportunity to create organisational resilience and innovation. The three stages of the transition are as follows (see Figure 4):

1. Endings

Transitions begin with an ending. The first stage of the transition is when individuals realise what they are losing and understand how to manage these loses. During this stage, people learn what is ending and what will continue. Examples of the first stage are losing a team member, relocation, new processes or ending a relationship.

2. Neutral zone

The second stage of the model is a neutral zone. This is a time when people are in-between the old and new; the old is gone, but the new is not yet fully developed. During this stage, critical psychological realignments occur which are the core of the transition model. Individuals generate new processes and learn what their new roles and tasks will be. People are in flux, which may cause confusion. The neutral zone functions as a seedbed for the third stage.

3. New beginnings

The final stage of the model is new beginnings, which involve new attitudes, understandings and values. These emotions and feelings release energy in a new direction and enable the expression of a fresh identity. Well-led transitions allow individuals to form new roles with an understanding of their purpose and how to contribute most effectively. The result of the new beginnings are the people feel reoriented and renewed (Bridges Associates 2020).

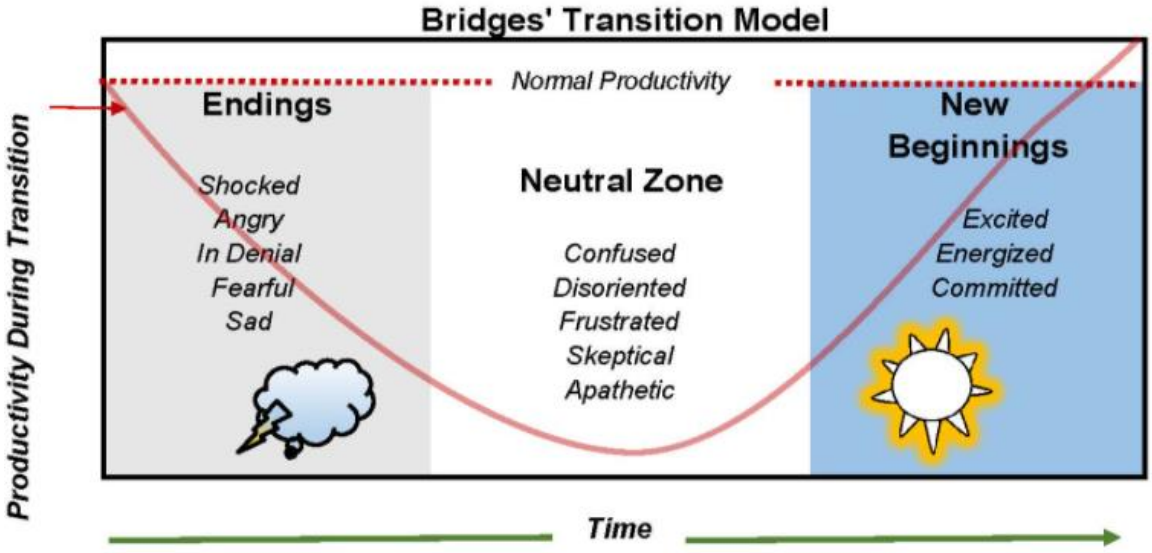

Figure 4. Bridge's transition model 2.

2.2 Leading change

Companies are forced to change to keep pace with the rapidly evolving world. Change has become the new normal, where companies are constantly updating and changing their systems and ways of working. Change initiatives are frequently raised in organisations to improve business and its profitability. Change leadership has an active role in today's businesses where executives and managers have a responsibility to help the business evolve by supporting the transformation journey. Business have moved from managing change (i.e., resources) into leading change (i.e., people).

An organisation's daily operations are closely linked to information technology, so it is important to decide what role it plays in the business. This allows the management team to measure what sort of attention and how much of development and running of IT systems should be taken care of by themselves and by others. To make this decision, two factors need to be considered: strategic impact of existing systems and strategic impact of application development.

The development of new innovative IT systems offers important strategic benefits to organisations. However, for others, they offer enhancement to specific internal performance as an off-the-shelf package. For some organisations, IT is a crucial part of operational performance where they rely 100 % on it, for example in manufacturing. For others, a disruption in IT can be invisible and slow to affect an organisation's performance.

For any organisation, IT management skills are a crucial part of the business which focuses on taking advantage of new and existing technologies. However, IT staff are often left out of core decision-making process since they are seen as implementers rather than strategists. The solution to this problem is to ensure that IT management skills are present throughout the organisation and not only in IT departments (Stumpf 2015, 2–7).

2.3 Changing information culture

Changing information cultures, which also requires the implementation of new IT systems, can be challenging. Problems occur when companies struggle to motivate people to use the new systems in the manner intended. New technological systems are expensive, and if changes are poorly implemented, IT investments cannot be fully incorporated into an organisation's daily life. Changes require implementation to change people's behaviours as well; simply changing IT systems and equipment is not sufficient. According to Thomas H. Davenport, an American academic and author specialising in analytics, business process innovation and knowledge management, 'a culture change may be required to create the shifts in information sharing required, because the introduction of new IT systems alone will not achieve this'. According to Davenport, it is about how people use information, not how they use technology.

Most of the information that people care about in organisations is not on computers. Managers and supervisors prefer to receive information from people rather than systems or computers because people add value to raw information by adding context and interpreting it. To change people's behaviours, the information management approach should be clear and explicit – a complex and detailed approach is difficult to internalise. According to Davenport, individuals willingness to share and use information is directly related to how much they have participated in defining it. To conclude, IT systems are expensive to implement. Executives should differentiate between implementing an IT system and changing company's information-sharing habits. The former will not guarantee the latter, which often requires a culture change that involves energy, money, commitment and clear direction (Cameron et al. 2015).

2.4 Understanding enterprise resource planning system

Enterprise resource planning system is a software which is integrated into a company's daily routines, and ERP systems are typically offered by vendors as packages to allow seamless integration of company information. This includes accounting, financial, HR, supply chain, sales and purchases, warehouse modules and customer information. According to Tarek Samara, a professional ERP expert and researcher, ERP consists of a set of fully integrated modules that run on the same database. This database covers all functions of the company and provides users with real-time data. There are two ways that ERP contributes to integration: process wise and data wise. With these systems, the software solutions aim for full integration of business functions and processes (Tarek 2015, 21–24).

To succeed in ERP implementation, the project expectations should be realistic, and the vision associated with ERP objectives and goals should be clear. What they want to gain and why are the basic questions executives should consider when starting the EPR implementation project. Addressing process changes is essential for the success of the project. Companies should also plan for how they will measure key performance indicators during the project to achieve their goals. It is also important to have management support during the project by clearly explaining the benefits of the project. A strong ERP implementation includes a detailed plan (Pelhprey, 2015).

The ERP update project adheres to the following plan (see Figure 5):

1. Plan
    a. Upgrade planning workshop
    b. Test installations of new ERP for test users
    c. Organise project

2. Design
    a. ERP foundation training
    b. ERP training for system administrators
    c. Review and test existing document templates
    d. Deploy additional server reporting services
    e. Upgrade of service content integrations
    f. Project management

3. Deploy
    a. Production database conversion
    b. Product system deployment
    c. Project management

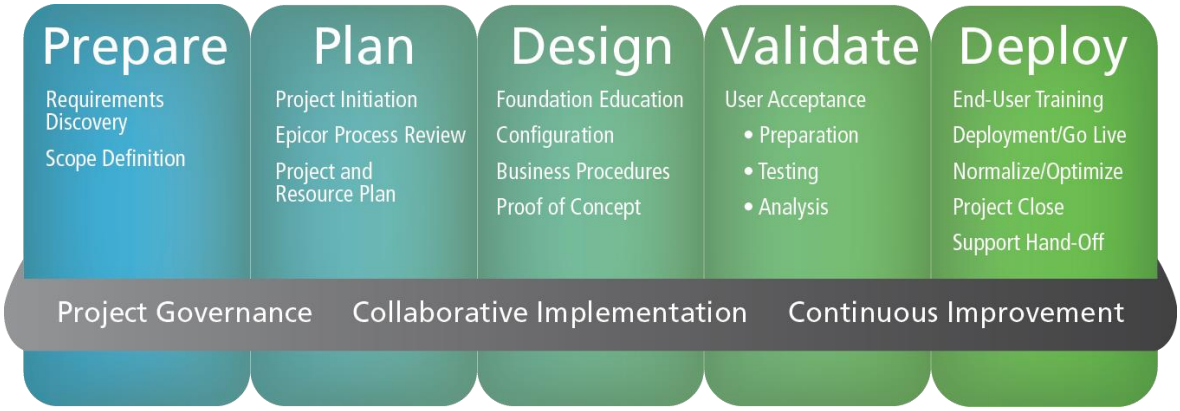

Figure 5. EPR project plan.

2.5 Continuous development process

The continuous development process is closely linked to the project plan of updating the company's former ERP. The project plan is based on continuous development process plan where the project follows the prepare-plan-deploy strategy. The first part of the project (i.e., prepare) includes identifying the opportunity and planning of the change. From the supplier's side, it includes planning workshops, test installations of the new ERP for certain test users and organising the project in general level. The second part of the project (i.e., plan) includes implementing the change on a small scale by reviewing and testing templates, checking feedback from test users, foundation and administrator trainings, as well as project management. The third step of the project (i.e., deploy) includes implementation of the project and continuously assessing the results. Once results and feedback from the change have been established, the project starts a new improvement cycle (see Figure 6).

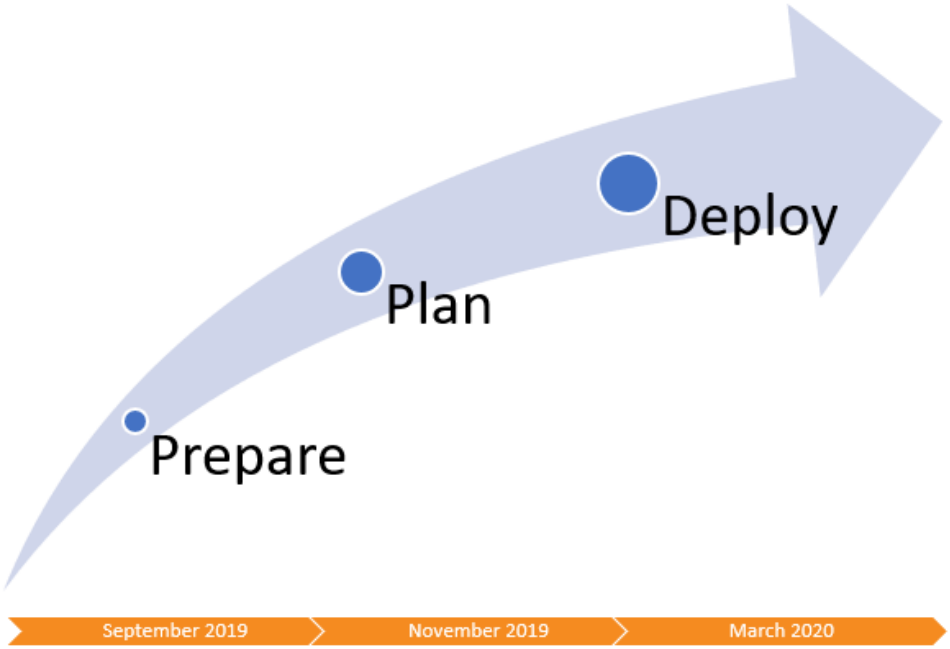

Figure 6. Continuous development process.

2.6 Conceptual framework

Kotter's and Bridges' change management and transition models are combined with clear confluences. Kotter's Steps 1-4 fall within the first stage of Bridge's transition model (i.e., endings). Steps 5-7 reflect the neutral zone, whereas the eighth and final step identifies the new beginnings stage where the replacement of an outdated system occurs.

The model is supported by interviews and observations that follow the idea of continuous development process. The new change management model is analysed and examined to determine whether this kind of model can be utilised in technological transformation. Besides interviews, the research focuses on observation during the project implementation.

To combine Kotter's and Bridges' models, two additional steps are added for a successful transition planning. The first step of planning transition is sharing the problem with the affected people. It is important to communicate the problem in advance to allow sufficient time for the people to adapt it. The second step of transition is collecting information from those closest to the change to assess the interests of people involved (i.e., what they want to protect when they are exposed to the change). Involving people in the problem-solving process helps gain their investment and secure the influence of the key opinion makers. The four Is of transition are thus addresses: information, interests, investments, and influence.

The third step of transition planning is doing an audit of the organisation's transition readiness to identify strengths and weaknesses. The fourth step relates to educating leaders about the nature of transition and how it differs from change. The fifth step involves getting key players to assess what needs to be released to make the change work as planned. Changes require transition, and transitions require people to let go of matters that used to be. This is why it is important to plan and foresee the importance of change.

Steps 6 and 7 related to the neutral zone between the ending and the new beginning, when problems often arise and people experience uncertainty and anxiety. During these steps, leadership focuses on guiding and motivating people towards the new beginning.

Step 8 pertains to monitoring progress of individuals and groups. Both bottom-up and top-down communications are important as some individuals may struggle to move forward in the transition process. Step 9 is closely linked to the previous step, as it relates to motivating and rewarding new behaviour and attitudes. It is important to help people understand what can be done to contribute to the change on a practical level. The last step is keeping

track of what works and what does not with regard to how people are handling the transition. Leaders can better manage the transition when they provide useful information and guidance to people involved. These 10 steps of transition are combined with Kotter's eight-steps change model, resulting in three zones of transition: ending, neutral zone, and new beginning.

The interview framework aims to determine how the change was implemented, how the people involved felt during the transition and whether a similar model can be adapted to technological change (see Figure 7). The interview questions are introduced in Chapter 3.

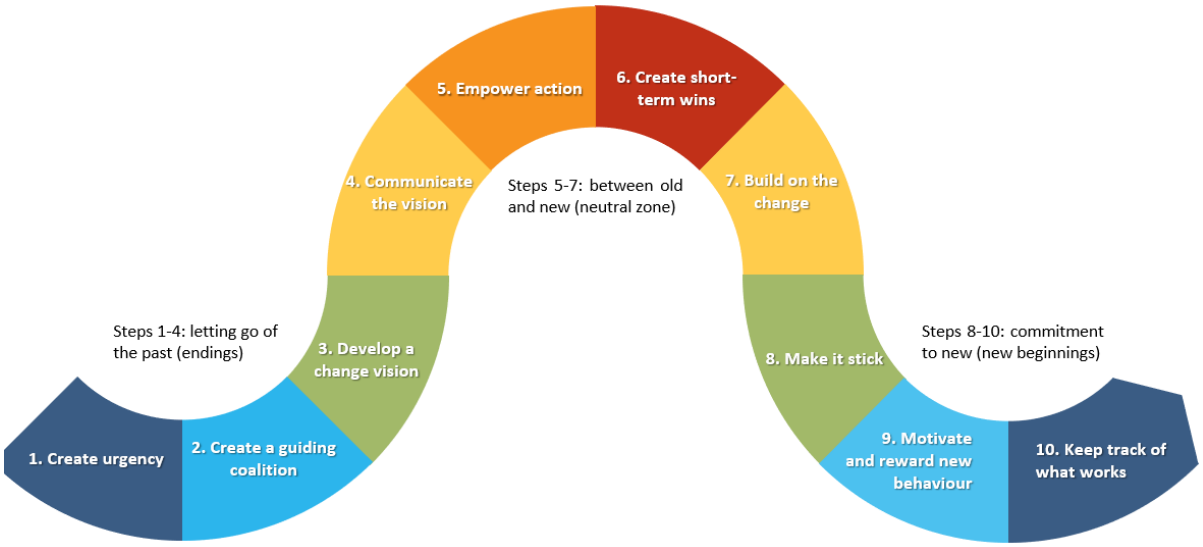

Figure 7. Combined change management model.

3 Methods

3.1 Research design

Lewin coined the term ‘action research’ in 1946, and it has been used since by management researchers in various contexts. Action research is divided into three themes:

1) research purpose (i.e., research in action rather than research about action)
2) practitioner involvement in the research (i.e., partnership between researchers and practitioners)
3) the iterative nature of the action research process (i.e., diagnosing, planning, taking action and evaluating)

According to Coghan and Brannick, action research is more complex than typical research because the researcher is part of the organisation within which the research and change process are taking place. It is also important to focus on employee involvement throughout the research process, as the change is more likely to succeed when employees help create it.

The action research spiral clearly demonstrates the research process through participative and collaborative approach. The cycle process includes diagnosing, which is also referred as fact finding and analysis. It then moves forward to the planning stage that enables actions to be taken and evaluated. The following cycles involve further diagnosis that takes into account previous evaluation, planning of next actions and evaluation of those. It is a continuous process that develops in every cycle (see Figure 8; Saunders et al. 2007).

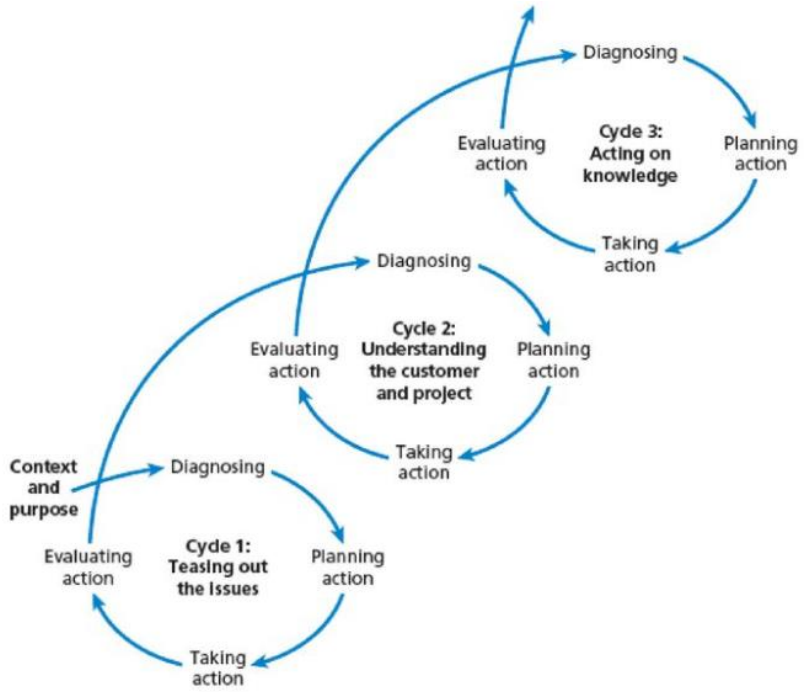

Figure 8. Action research spiral. (Saunders et al. 2016)

The implementation process of new ERP is supported by action research, as it is a continuous development process. The software is continuously developed by users, after which future actions are taken (see Figure 9). Although the system has a limited number of features, the processes and actions used daily can be made more user-friendly.

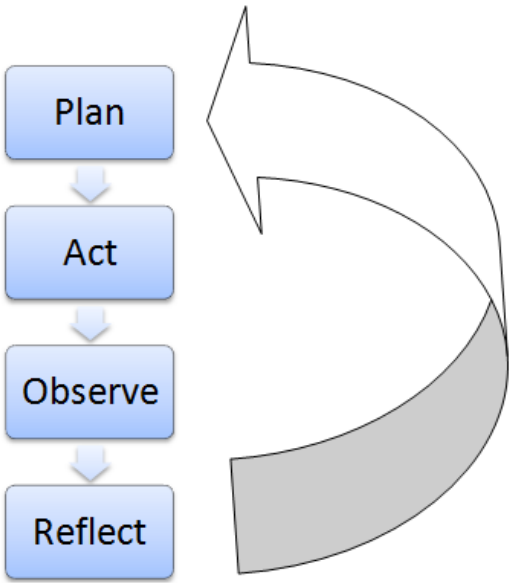

Figure 9. Continuous development process of ERP

3.2 Data collection design

The main data of this study is based on qualitative research. Qualitative research aims to understand the quality, features, and meanings of the subject. Interviewing groups of individuals and in-depth observations are qualitative approaches. Qualitative research helps to explore and assess culture, phenomena and structural processes. It could involve investigating the behaviours of a group of people in a particular setting and assessing experiences, policy changes and its impacts on a specified group. The focus questions of the chosen topics are what, how, when, where and why. The target group of a qualitative research is small sample chosen via discretionary selection (Shapiro 2018).

The interview data were transcribed by writing answers in text form and summarising them. The goal is to determine whether similar steps or issues can be recognised in technological transformation compared to the developed change model. The population for the interviews was selected by judgement sampling where the researcher selected appropriate participants. The advantages of qualitative interviews are that researcher can correct misconceptions that may occur during the interview, ask the participant to specify answers as needed, and change questions if they do not seem to work. However, qualitative inter-

views are also a time-consuming and demanding data collection method. As the researcher seeks to understand people's motivations, actions and reasons, qualitative research is a valid method. It offers detailed information and provide knowledge of a variety of areas by giving insight into individual experiences. It help the researcher to analyse behaviours, attitudes and values.

Observation refers to collecting information and studying people's actions. It is the systematic following of a target person or group. Surveys and interviews reveal emotions, beliefs, and perspectives . Observation seeks to answer the question 'What really happens?'; it can be used as a standalone method or to complement other methods (Hirsjärvi et al. 2015, 212–213).

Observation is categorised based on the level of structure and participation. In systematic observation, the observer (i.e., researcher) avoids participating in the action. The observer has basic information about the research area and follows a structured and detailed plan. As an active observer, the researcher attempts to affect the subject of study. As a passive observer, the researcher is part of the group but does not try to affect the action (Hirsjärvi et al. 2015, 212–213).

Observation in this development project was made with an unstructured agenda as a passive observer. The observations took a place throughout the research process and focuses on people's feelings and actions during the change. The observations aimed to follow the change management model.

According to Grbich, there are three key issues in general approach of collecting and analysing qualitative data: persons, processes, and presentation. The person involves the researcher's views and choices and their impacts on the data collected. The processes relate to the design and methods used, the data quality and how they are managed. Presentation refers to the display of findings and the theoretical interpretation of the analysed data which is presented to the reader to assess (Grbich 2013, 1).

The interview was conducted using a semi-structured theme interview method. In the structured interview method, the questions are predetermined, and the interview follows a strict agenda. By using the semi-structured interview method, the interviewer can ask focused questions during the interview session, if needed. In the theme interview, the interviewer determines the themes to be discussed. While all interviews follow the same themes, the interview structure and the depth of the discussions may vary from one interview to another (Hirsjärvi et al. 2015, 214–216).

Once different sources of data are gathered, the information is qualitatively analysed. Qualitatively analysis includes becoming familiarised with interview responses, checking research objectives and identifying research questions which can be addressed with the information gathered from the interviews. The goal of qualitative analysis is to gain the understanding of research objectives by revealing patterns and themes in the data.

3.3 Interview framework

The interview questions are based on Kotter's and Bridges' change management and transitions models, which were combined in Section 2.5. The goal of the interview was to determine how people involved felt during the ERP implementation and whether the implemented change management model followed the same steps as the ERP project in the case company. The interview questions were as follows:

1) How much do you use ERP in your daily work?
    a. What functions do you use in ERP?
2) What were your main struggles with the previous ERP system?
3) What benefits does the new ERP offer you?
4) How clearly did you see the need for the new ERP?
    a. What was positive in this transition?
    b. Was the transition phase visible to you?
5) Would you have preferred to be more involved in the transition process?
6) What benefits does the new EPR offer to the organisation?
7) What were your key concerns related to the change?
8) How well have you learned the new software?
9) Would you like to have training or guidance for the new software?
10) What could be improved now or in the future?
11) Open comments

Interviews were conducted with total of seven participants who were involved in the technological change. The participants worked in different departments and tasks and used different functions of the software. Some of the participants were actively involved in the transition, whereas other participants were tangentially involved.

3.4 Validity and reliability

The validity of the qualitative interview demonstrates the results that the research is supposed to measure. Validity can be guaranteed by carefully composing the interview questions to ensure that appropriate questions are asked. Validity is increased by applying relevant theories that support the interviews. The results of the interviews shows the correspondence to research questions. Reliability is guaranteed, as the same interview questions are asked from each respondent which confirms repetition. The researcher ensured

trustworthiness and authenticity of the results. All interviewees work full time with over 10 years of working history in the case company. The primary data is collected by qualitative interviews, which is supported by data received from observations during the research project. The open-ended questions used in qualitative interview allow for wider and more meaningful answers from interviewees.

4 Interview results

4.1 Main observations after deployment

Question 1: How much do you use ERP in your daily work?

The majority of interviewees used ERP during more than two-thirds of their daily working hours. Employees who worked in sales and customer service used the program more actively than those in management. Nearly 60 % of the interviewees used ERP for six to eight hours per day, 28 % four to six hours and 12 % zero to two hours (see Figure 10).

From the sales point of view, it was crucial to have the ERP constantly working throughout the day, as the program is needed for daily business. A minority of the interviewees used ERP for less than two hours daily, and their activities are heavily seasonal. These interviewees worked in management where the use of ERP was generally less active compared to the sales organisation.

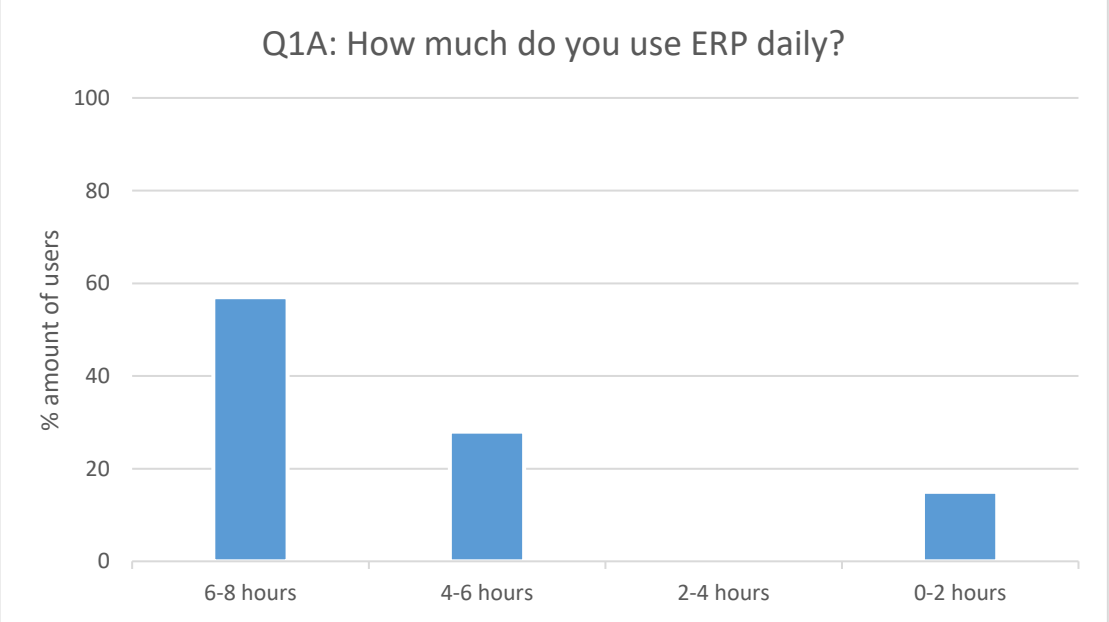

Figure 10. The use of ERP daily.

In general, ERP covers all business transactions that employees need, and no other software is used in the business. This was the main reason why majority of interviewees spent most of their working hours in ERP. The main functions that interviewees used in ERP were stock list, sales order creation, customer relationship management and reports (see Figure 11). The stock list function was widely used at all organisational levels and business units, whereas update functions were monitored by one person.

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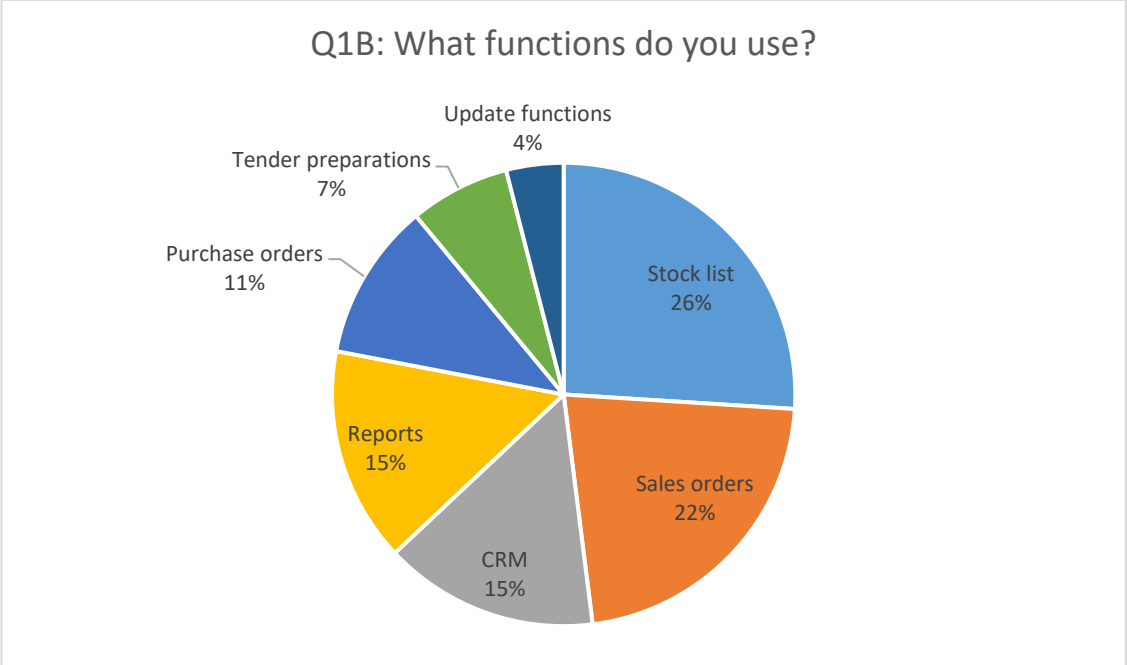

Figure 11. ERP functions.

Question 2: What were your main struggles with the former ERP?

The main struggles that interviewees experienced with the previous ERP were slowness and a lack of shortcuts (see Figure 12). Finding correct transactions in the program took time, and occasionally the slowness required the software to be restarted. The previous ERP did not offer shortcuts for the users, and therefore all transactions had to be manually entered. However, approximately 15 % of interviewees did not have issues with the previous ERP and replied that the program was working well.

Because the ERP was updated to a newer version which was offered by same vendor, the interface of the software did not change radically. This eased the use of the new ERP when the software was updated.

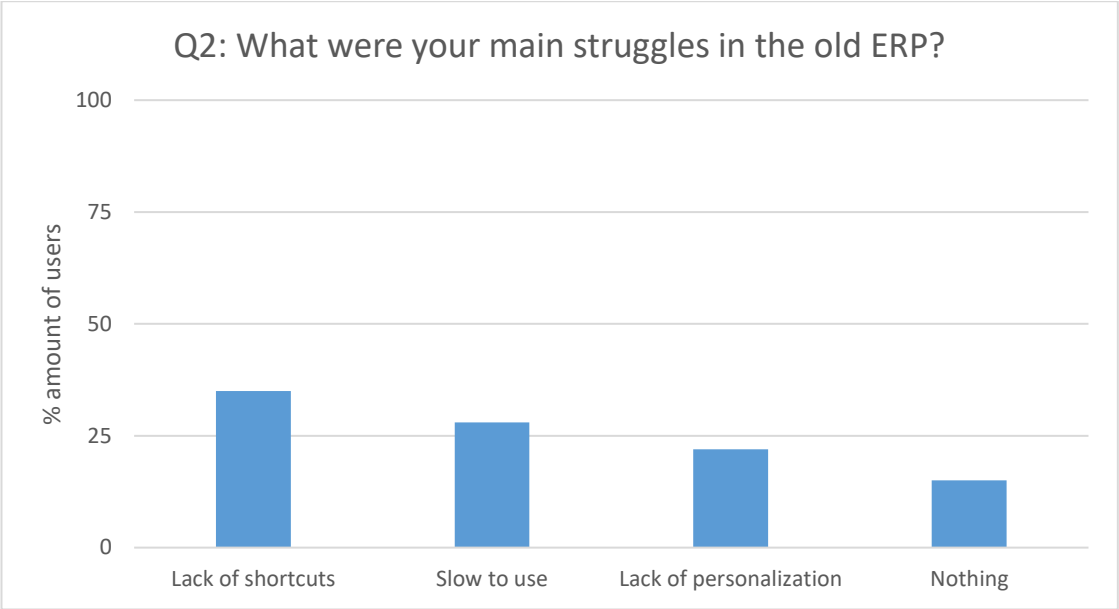

Figure 12. Main struggles with old ERP.

Question 3: Why do you believe that the ERP was updated?

The reason for the update process was unclear to the interviewees; 43 % believed that the lack of available updates for the previous software was the reason for the update. Other answers included the ability to work remotely, the cloud change, and increased effectiveness (see Figure 13).

Although interviewees were aware of the updating process and its schedule, the reason for the change remained unclear. The main reasons for this were the lack of interest among interviewees, as they did not feel it was relevant to them. A lack of information concerning the update process was also mentioned in the interviews. The main information concerning the update process was communicated via company email, and the company's intranet was also updated during the process.

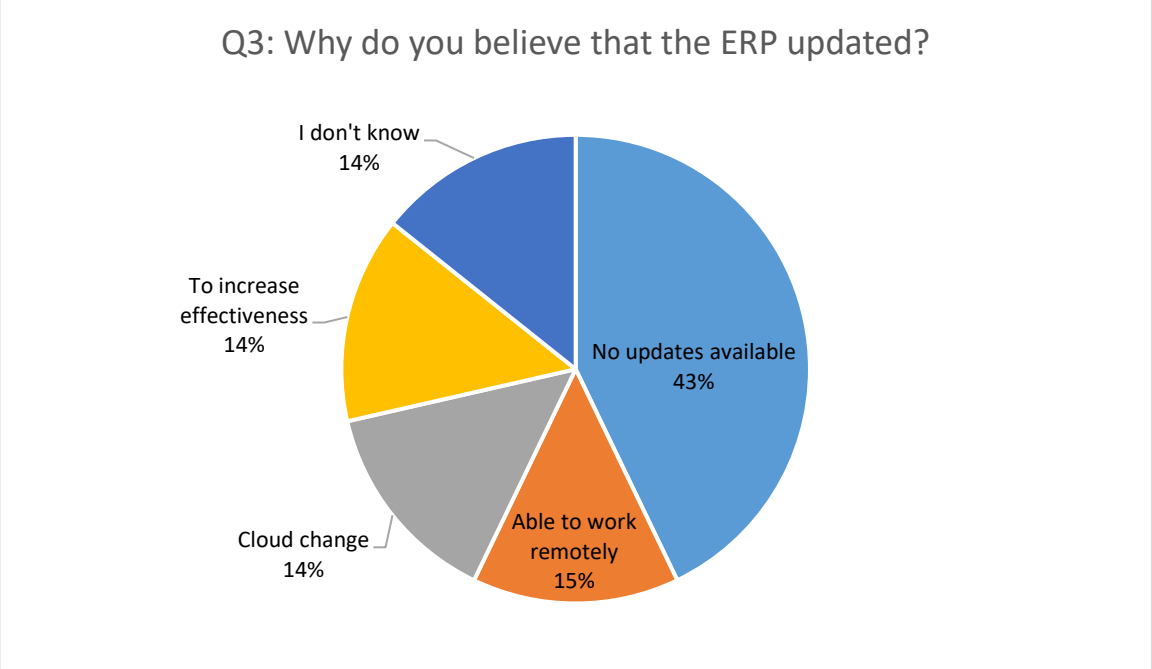

Figure 13. Reasons for ERP update.

Question 4: How do you benefit from the new ERP?

The new ERP offered many benefits for its users, especially shortcuts to transactions. Additionally, having the ability to personalise the appearance, include attachments and simply being faster software were benefits that the interviewees discovered (see Figure 14). A small percentage of interviewees did not see any benefits in the new software.

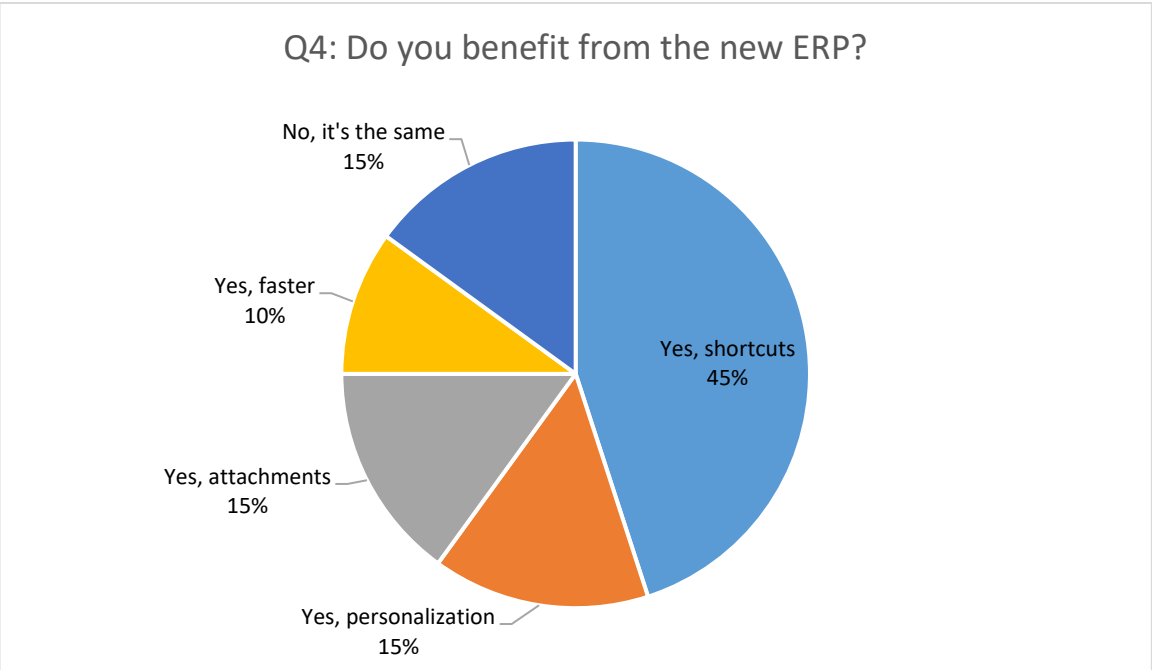

Figure 14. Benefits of new ERP.

Question 5A: How was the implementation executed?

The implementation process was well executed. All interviewees agreed that the implementation process was smooth and did not interfere with their daily work (see Figure 15). One of the main worries among employees before the implementation was whether the process would make their daily tasks more difficult.

These results support the fact that the implementation was planned and executed well as 64 % of interviewees had positive feelings about the process. Approximately one-third of interviewees replied that the implementation was not visible to them until the new ERP was being used.

One of the reasons for the positive feedback was the transparency of the implementation process. Employees felt that the process was simple and well organised. Even though the reason for the change was unclear, the change itself was visible and easy to adapt to. The company announced the go-live date to the organisation. Before the go-live date, the company conducted a one-month test period for specific users who were able to test the new software and detect possible errors that would need to be fixed. During the test period, all transactions were tested to see if they worked properly, and different reports were printed to check their layout.

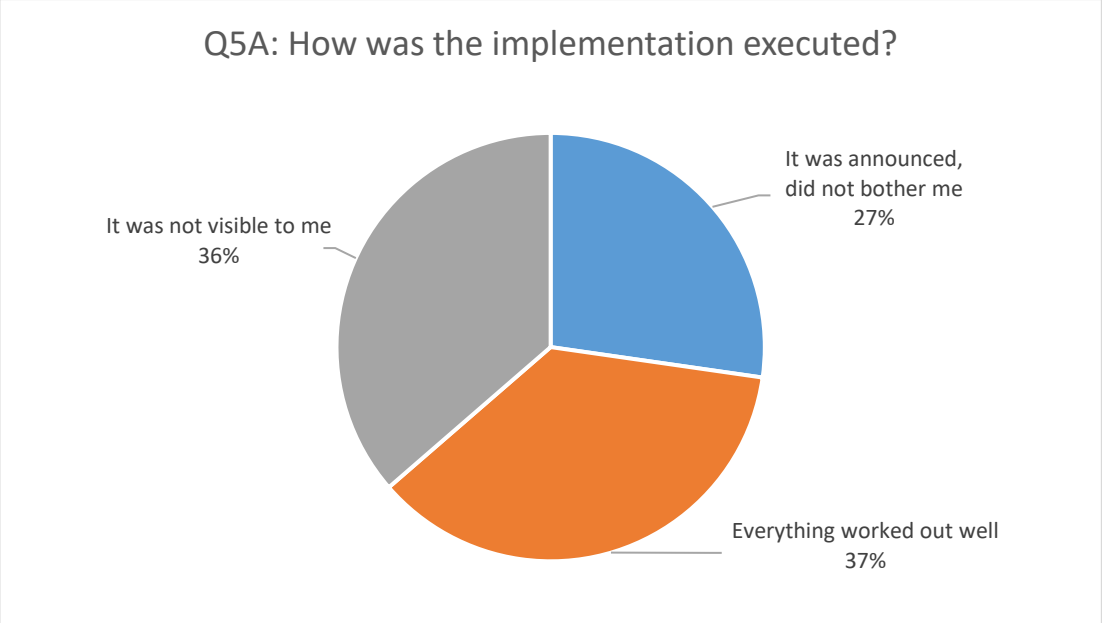

Figure 15. Feelings about implementation.

Question 5B: Was the process visible to you?

The implementation process was visible for 43 % of the interviewees, whereas 57 % responded that they paid little to no attention to the project (see Figure 16). Because the implementation was successful and no major problems occurred during the process, the ERP change did not receive a great deal of publicity prior to the go-live date.

The go-live date was announced in advance, and when the change happened, the new program started to work sufficiently. The go-live date was the most visible part of the process to majority of employees.

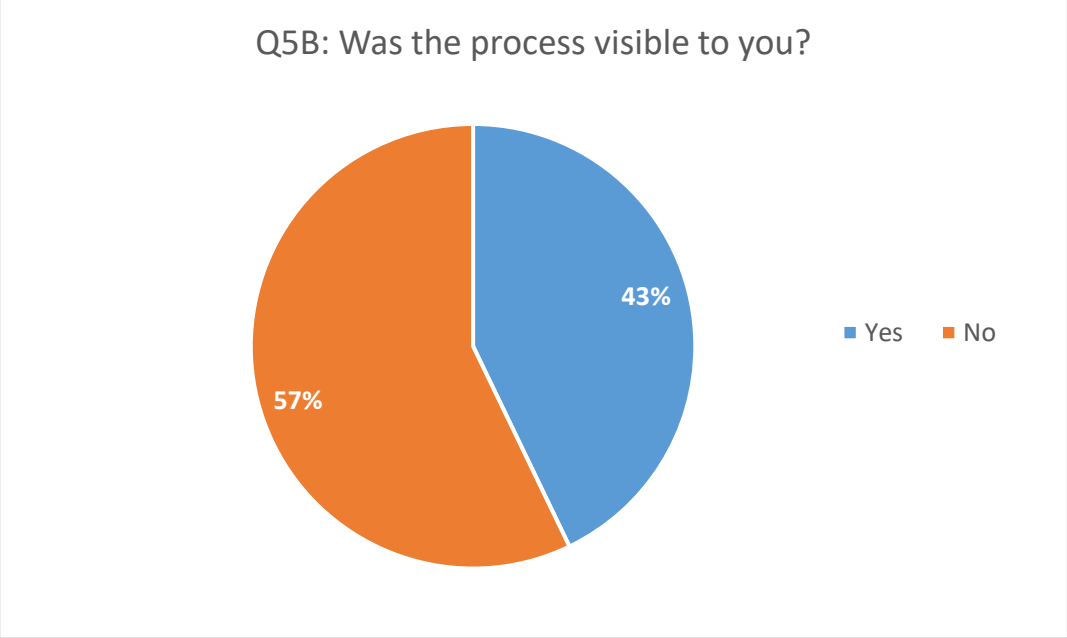

Figure 16. Visibility of the implementation process.

Questions 6: Would you have preferred to be more involved in the process?

Figure 17 illustrates the distribution of yes and no answers concerning the contribution to the ERP project. After the new ERP was implemented, it was important for the company to know whether employees would like to be more involved in similar changes in the future. This was also valuable information concerning the future trainings and their ERP-related content.

A majority of the interviewees preferred not to be more involved in the process. The main reason for this was a lack of time. Approximately one-third of the interviewees would have preferred to contribute more to the process in order to share more ideas of what transactions are important from their point of view, for example in sales.

Nevertheless, the organisation openly discussed the ERP change and ensured that those interested in the process could share ideas and give feedback. The project team actively raised the topic in the organisation's intranet as well as during lunch breaks, allowing everyone to contribute.

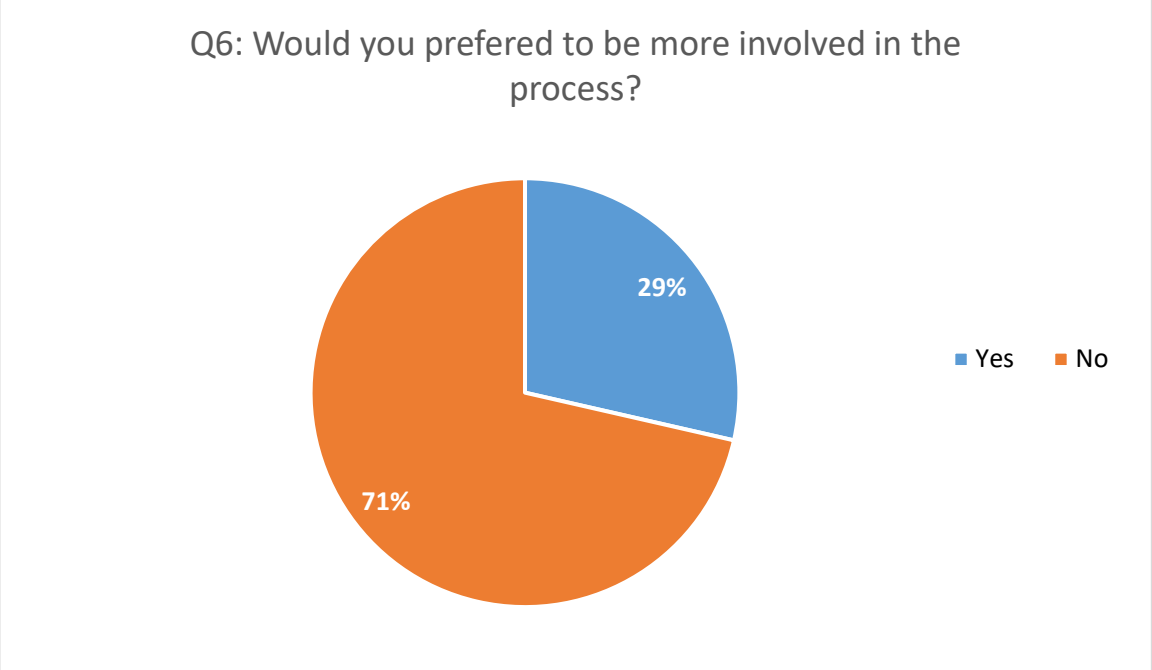

Figure 17. Preference of contribution in the ERP process.

Questions 7: What benefits does the new ERP bring to the organisation?

The main benefits concerning the new ERP were related to sales, warehouse management and effectiveness (see Figure 18). The sales benefits included easier and faster transactions, which was seen as a positive reflection on customer service. Warehouse management benefited from upgraded access to transactions which allow the warehouse to work more independently and effectiveness in terms of faster software. In addition to the technological benefits, the employees found organisational benefits that would ultimately help them in their daily work.

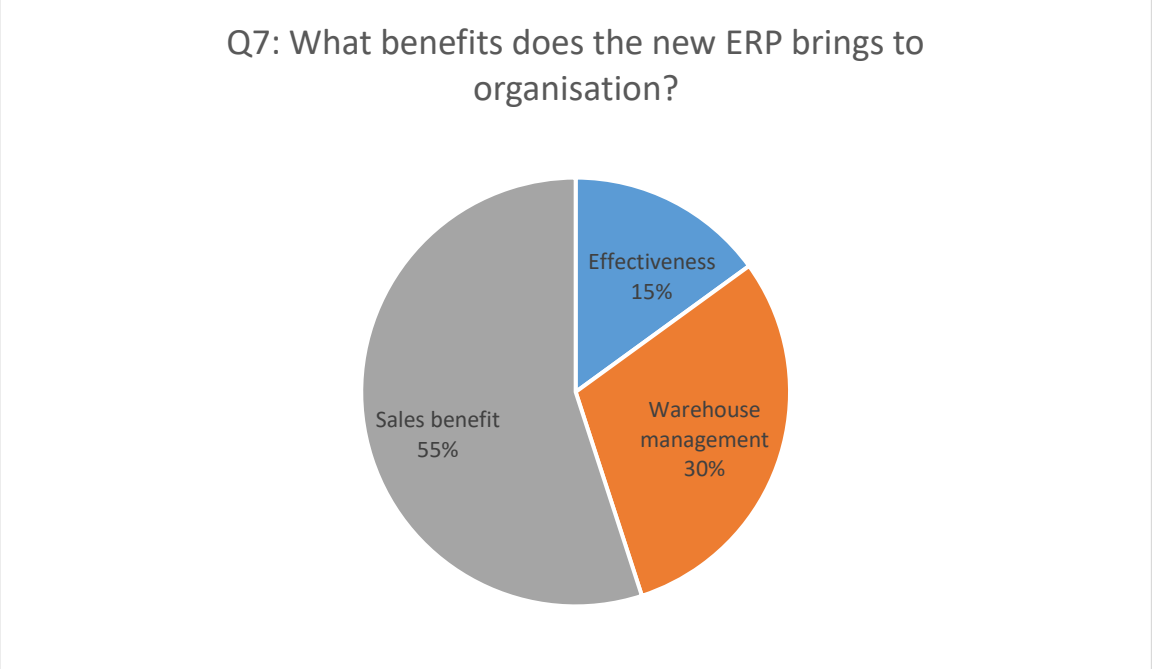

Figure 18. Organizational benefits of new ERP.

Question 8: Did you have any fears with regard to the new ERP?

Question 8 was related to fears concerning the new ERP; 86 % of interviewees responded that they did not have any fears regarding the new ERP before the deployment (see Figure 19). The majority of interviewees felt confident about the new program. Because the implementation was discussed openly, and the ERP was updated to a newer version rather than changed to a new provider, users felt assured to face the change. The time of deployment of the new ERP was carefully planned and scheduled during a non-busy season. This decreased pressure, as users had more time to practice and become familiar with the program. Fears that certain interviewees faced were related to how well others would learn and adapt to the new software. Some worried that other employees would need to take the time to help train others, which would decrease their time to perform their daily tasks.

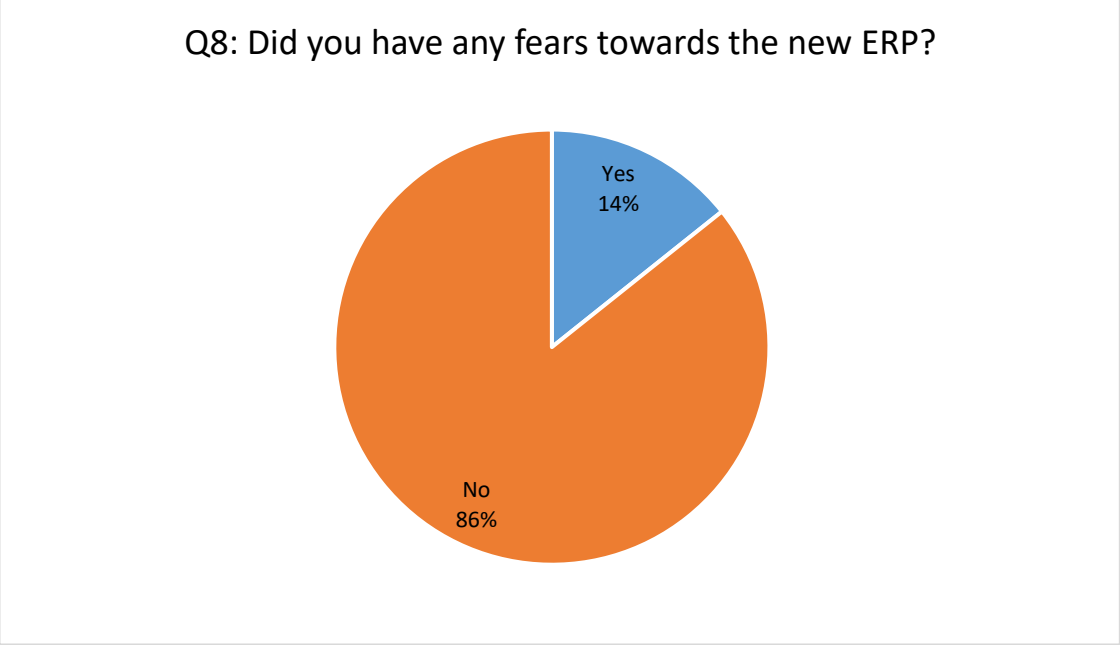

Figure 19. Fears concerning new ERP.

Question 9: How well have you learned the new ERP?

The new ERP was offered by same supplier as the previous version, which eased the deployment. All of the interviewees have learned the new software well (see Figure 20). Approximately 70 % stated that they still need occasional support or know that there are functions to be discovered that they currently do not know how to use.

Users who are more interested in discovering the possibilities of the ERP recognise that the software has many functions that are not yet fully utilised. However, nearly one-third of the users feel that all the necessary functions are already in use, and they do not wish to learn more of the system.

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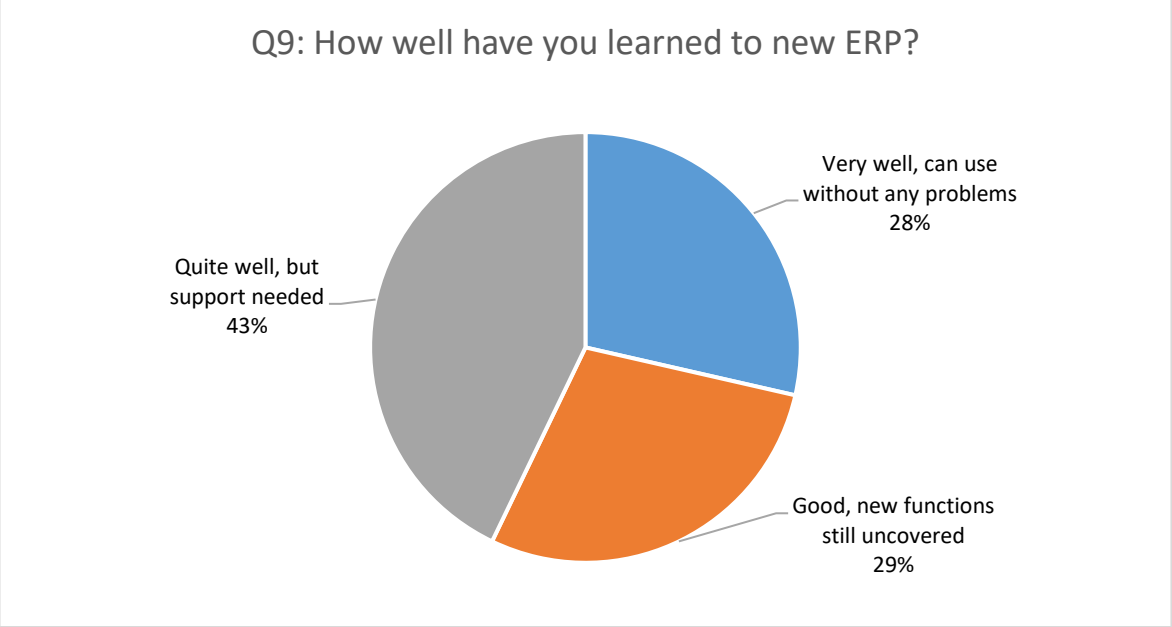

Figure 20. Results of learning.

Question 10A: Do you wish to have any trainings?

Majority of the interviewees preferred to have more trainings for the new ERP. As Figure 21 illustrates, over 70 % of the interviewees replied ‘yes’ when asking about the interest towards trainings. Well-executed implementation reflects the interest towards trainings where employees have faced a positive change. This leads the users wanting to learn more of the program and be able to utilise all transactions fully in their daily work.

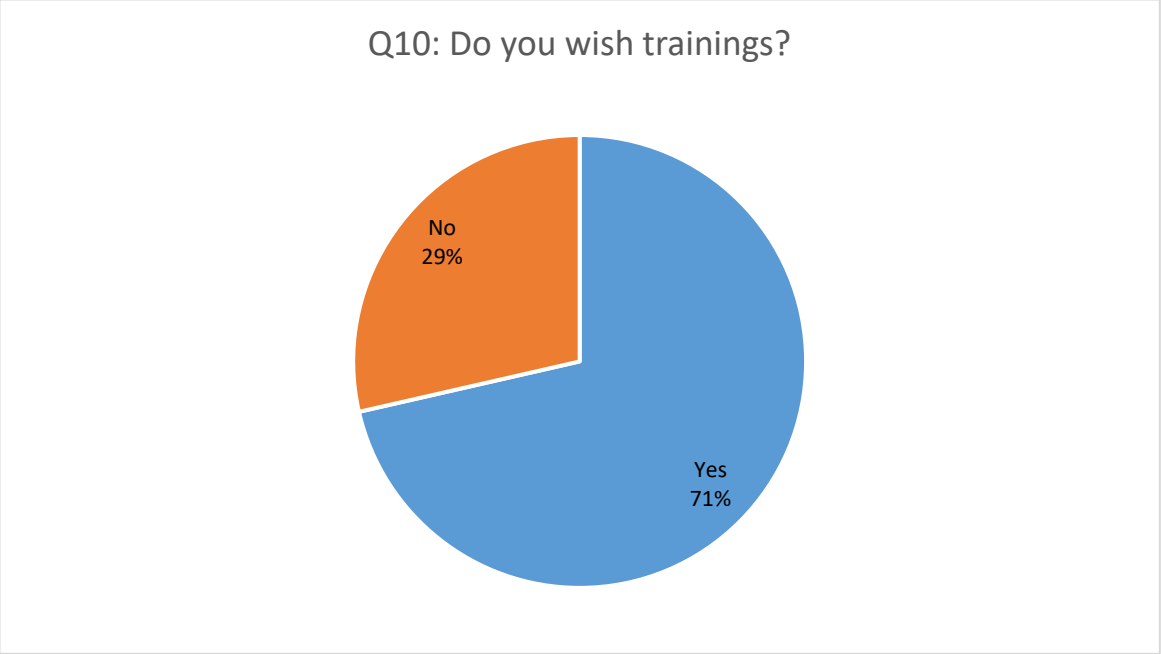

Figure 21. Willingness towards trainings.

Questions 10B: What particular training?

The last question of the interview pertained to what specific trainings the employees wished to have in the future (see Figure 22). Trainings for specific functions (e.g., reports) were preferred, as well as the organisation's own guideline for the ERP which includes best practices and common transaction abbreviations. Such guidelines were helpful for both new and experienced employees. Employees were also interested in trainings for new functions that are not yet used in the ERP system. Some deliberation was also related to possibilities to link different functions, such as creating purchase orders from the sales orders template, and if possible, to have trainings for these purposes.

Figure 22. Subjects of trainings.

4.2 Summary of interviews

The new ERP is widely used in the case company. The majority of employees used it during more than half of their working hours, as it is critical and mandatory tool for daily business. Especially the sales department is dependent on ERP as they navigate between sales orders and warehouse stock lists.

The main issues the employees faced with the previous ERP were related to its slowness and lack of shortcuts or personalisation. However, these issues were not critical and did not disturb users considerably because the former ERP had been in use for several decades.

The reasons for the update was unclear to employees. The majority of interviewees had an answer with regard to the reason for the change; however, only 43 % knew the correct answer. The main reason for this was the lack of interest, as majority of employees saw the update project as a notification from the company rather than a project where they are personally involved.

The well-executed implementation process of the new ERP led to its successful deployment. The new program was easily adopted, and no major problems or challenges occurred after the initialisation. For most of the employees, the go-live date of the ERP was the most visible part of the implementation process. Once the new ERP was in use, 85 % of the employees felt that it offered them new benefits.

Approximately one-third of the interviewees would have liked to have been more involved in the implementation process. The reason for this was to have the ability to share more ideas and aspects of what is important for the employees in different departments to have in the new ERP, such as central transactions for sales. For the similar projects in the future, this is valuable information.

In addition to the personal benefits they experienced, the interviewees felt that the organisation also benefited from the update process. Interviewees sensed that the new program brings increased effectiveness to the company and creates value for the sales and warehouse departments.

All interviewees felt that they had learned the basic transactions of the new ERP and did not need support with them. For more specific transactions, such as reports, 43 % felt that they still need support. These answers reflected an interest towards new trainings that represented the employees' willingness to learn more of the new ERP.

4.3 New version of the change model

The research is based on two main change management models, John Kotter's eight-step model for change and William Bridges change transition model. These two theories built the theoretical framework from which a new model was developed for this research. The new change management model included the necessary steps for technological change. These steps were tested in qualitative interviews to observe whether the invented model was suitable. After the interviews, the invented change management model was updated into following form (see Figure 23).

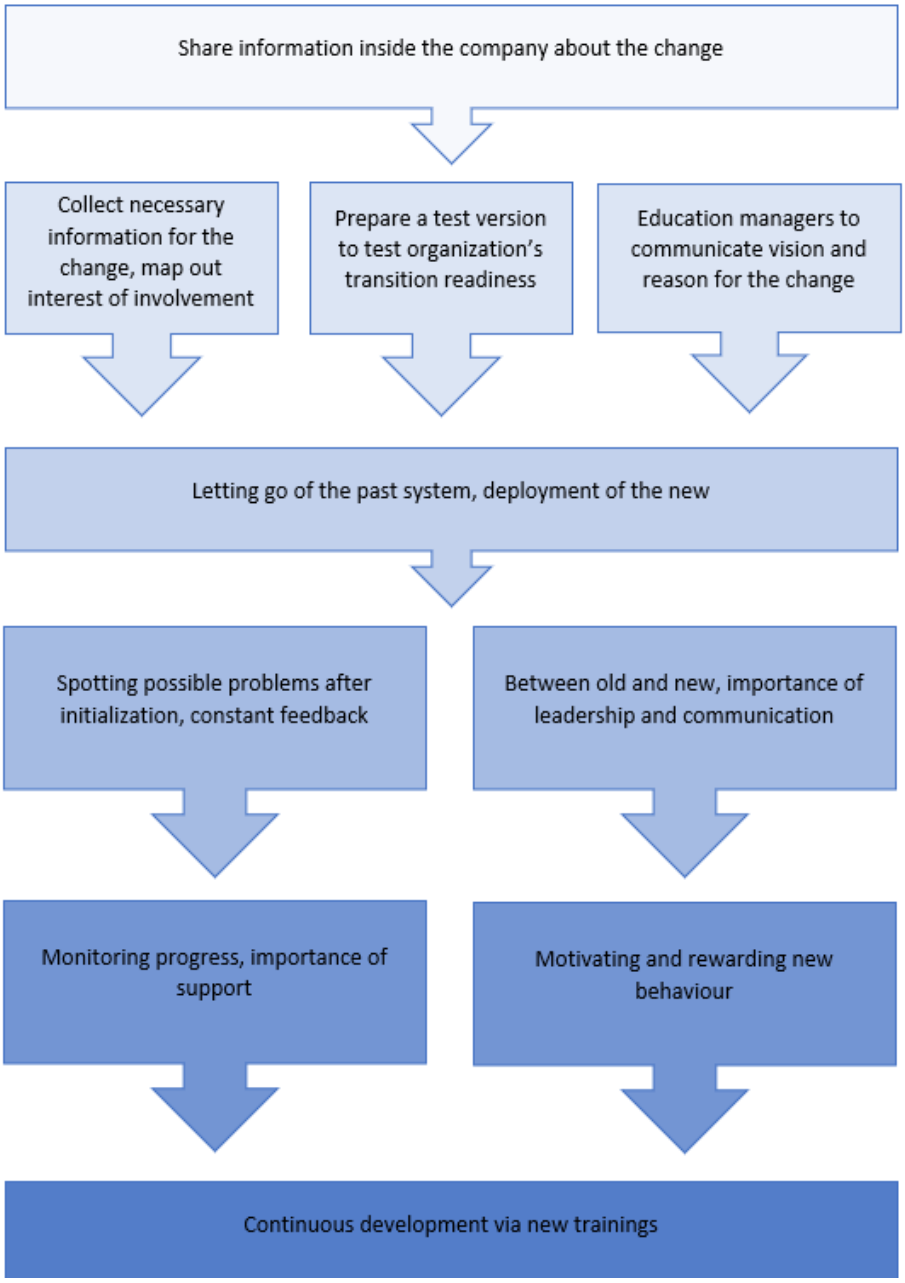

Figure 23. Updated change management model.

This model conveys the importance of communication throughout the process, which was noted in the interviews. The basic structure of the model remained the same, but the steps were reorganised. In the updated model, various steps take place simultaneously where actions and feelings overlap.

5 Research analysis

The new model supports the research questions which were introduced in Chapter 1:

1. What kind of change management model can be applied to technological change?
    a. What factors are most effective in a successful ERP transition?
    b. What does the existing change management literature conclude?
    c. What can be learned from this model?

The company can apply the updated model to similar technological changes and take important matters into account, such as mapping out interest in involvement during the change process. In the original change management model, the transition time between old and new was relatively longer and they were overlapping each other's. However, as in this case, the change from old to new happened relatively quickly, and after the go-live date, the previous software was no longer available to employees. Before the go-live date, a selected group of employees tested the new software, whereas this test time was more consistent with the original change management model. Once the case change is executed and the interview data are analysed, the time between old and new is comparatively short for technological changes.

As a new perspective, the importance of support and communication was raised as one of the key topics throughout the change process. From the beginning of the change process, communication underlines the coming change and its importance to the organisation. It is important for employees at all levels to be aware of the coming change even though they would not contribute to it until the actual change. As can be seen from Kotter's and Bridge's change management models, change requires time, and the earlier it is announced, the more time organisations have for their employees to adapt to it. One of the key findings from the interviews was the interest towards new trainings. This is important for organisations to acknowledge from the beginning, in order to map out the ideal areas for future trainings once the change is happening. By doing so, the change is still relevant for employees as they are experience it simultaneously, and organisations are able to offer trainings as a continuous development plan immediately after the change has happened.

6 Conclusion

6.1 How the results were achieved

For the research question, '*What kind of change management model can be applied in technological change?',* an answer was sought via sub-questions. The first sub-question, '*What factors are most effective in successful ERP transition?'* was first examined through Kotter's eight-step model and Bridges' transition model. The outlines for this question were subsequently sketched and tested in the interviews. The interviews revealed valuable information, after which the created change model was updated.

The second sub-question, '*What does the existing change management literature say?',* sought an answer from the literature review of change management theories, and two change management models were thus selected for this study. After the first sub-question, the research questions outlines were determined, whereas the second sub-question focused on the main elements that the model should include. The third sub-question, '*What can be learned from this model?',* was discussed in the research analysis that highlighted the important differences that were revealed during the interviews. These changes were taken into account when the change model was updated. In sum, communication and active involvement of participants play key roles in successful change management.

The uses of the new change model are many and varied. The possible examples of the use include a guideline for similar technological changes, a support document for a project team, an opening for a project presentation and a learning method or tool. The case company has free usage of the new model and this study content.

6.2 Development ideas

Changes and transitions are time-consuming projects. They require comprehensive planning and strong leadership skills to succeed. With a proper project plan, change can be faced without insurmountable problems and resistance. Change involves people, and people are the key to lasting change. In today's world, new technologies and innovations occur weekly. Change has become a norm for modern businesses where functions and ways of working are constantly improved and updated. To remain competitive, businesses have to make sure that their profit executors (i.e., people) are able to keep up with constant transitions.

As a development idea for similar technological changes, ‘project labs’ for different departments would be useful to allow employees to actively participate in the change. The project labs would be divided between different departments to gain feedback in regard to what important functions for each department should be taken into account when implementing, for example, a new software. These project labs could also brainstorm ideas for potential future needs and tools that could be useful for the organisation.

It is recommended that the case company prepare a brief guide for easy ERP use for employees to use. Such a guideline was desired by employees when future trainings were discussed. This guide would also be helpful for new employees who have not used the company’s ERP system previously and need initial assistance with basic transactions.

For future technological changes that the company is likely to face, the updated change management model should be utilised in the initial planning stage. The updated model highlights the main issues involved in the process and reiterates the structure needed for a successful change.

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