Identification of the factors affecting
KMS adoption and utilization for the
technical training process
A single-case study within heavy industry

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Abstract
The intensifying value of learning, competence, and knowledge motivates decisions toward implementing knowledge management systems (KMS) to capitalize on the potential benefits of facilitating knowledge sharing, collecting, storing, and dissemination on a global scale. However, these systems frequently remain underutilized, and organizations encounter obstacles to achieve their proposed outcome. The case company experienced practical problems regarding a newly implemented KMS. The system was largely unused for a specific process. Therefore, this case study investigates the factors affecting KMS adoption and utilization for the technical training process by capturing the perspectives of the intended system users and management. A combination of KMS success factors and The Theory of Affordances were applied to generate knowledge regarding how factors affected the usage of the KMS. It was found that Management Involvement, Organizational Culture and Structure, Employee Commitment, Perceived Benefits, System Complexity, and Compatibility and Conformity influenced the users' KMS utilization outcomes. A conceptual framework was developed to show how these factors affected individuals' affordances process.

Keywords
KMS Adoption; KMS Factors; Knowledge Management; Knowledge Management Systems; Success Factors; KMS Success Factors; KMS utilization; Case study; Heavy Industry; Affordance Theory.
Foreword
This thesis was written as completion of a bachelor level program within informatics, specializing in information logistics at Linnaeus University, Sweden. Conducting this study has been a significant educational period for both of us, gaining knowledge about how an organization manages knowledge with digitized means. Insights have been made on how contextual, organizational, technical, and individual aspects affect systems' success. Hence, the approach in which companies adopt systems demands to be meticulously and systematically thought out. A variety of factors will, in all likelihood, impact the system outcome; therefore, these factors must be anticipated during the adoption of new systems. The emerging phenomenon "the knowledge economy" has magnified the importance of knowledge. Companies find themselves strategizing to attain and develop knowledge resources to gain competitive advantage. Thus, this thesis could benefit companies who find themselves approaching decisions to implement knowledge management systems.

We want to thank all the participants who willingly partook in this thesis. Without their information and perspectives, this thesis would not have been possible to conduct.

Further, we thank the case company that allowed the research to be conducted within the company environment.

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*Ljungby, May 2020*

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1 Introduction

As the global marketplace is transitioning into a knowledge-based economy, companies are opening their eyes to investments within knowledge management solutions (Wang & Wang 2016). The increasing value of learning, knowledge, and expertise drives top-management decisions towards implementing knowledge management systems (KMS) in order to capitalize on potential benefits of facilitating knowledge collecting, storing and dissemination on a global scale (He et al. 2009; Kuo & Lee 2011; Lin 2013; Sher & Lee 2004; Wang & Wang 2016). KMS are known to provide companies with competitive advantages, as they allow for maximizing and optimizing the use of organizational knowledge resources, creating leverage on the market by enhancing internal knowledge assets (Cham et al. 2016; Gressgård 2015; Kuo & Lee 2011; Wang & Wang 2016). However, the potential benefits of knowledge exchange systems are well-known and have been frequently highlighted in previous studies, yet, these systems frequently remain underutilized within organizations (Gressgård 2015; He et al. 2009; Lin & Huang 2008). Hence, researchers seek answers as to why KMS commonly are challenging to adopt, and what affects their success (Akhavan et al. 2006; Cham et al. 2016; Gressgård 2015; He et al. 2009; Hung et al. 2005; Lin & Huang 2008). The factors of successful adoption of KMS are needed for companies to avoid investing money and time into deploying and adopting these systems to end-up not using them. KMS usage is explained by He et al. (2009, p.175) as:

“[…] an employee’s intentional actions of using KMS for knowledge sharing in long-term practice, which could include creating a knowledge document, transferring knowledge to others, requesting knowledge from others, and two-way constructive discussion and communication through the KMS.”

Moreover, to further understand these information systems (IS) artifacts in relation to the organizations and how these relate to each other, The Theory Of Affordances is sometimes applied (Leonardi 2011; Leonardi 2013; Markus & Silver 2008; Pozzi et al. 2014). Generally, information systems offer different intangible properties that facilitate actions based on contextual settings, and also how they are utilized within the context (Markus & Silver 2008). This thesis will combine previously identified KMS success factors, Pozzi et al.’s Affordances Theoretical Framework in order to understand which factors affect the utilization of an implemented KMS. The empirical content of this study was collected from a case company that faces the identical predicament as countless other organizations; experiencing low levels of use for a KMS. The utilization of the system was perceived to be particularly low for a specific process, the technical training process. Hence, the technical training process was the subject for the empirical study in order to investigate the reasons why the system is not used, identify, and analyze the different factors affecting KMS adoption and use.
1.1 Case Background
This is a case study requested by the case company, which intends to investigate how the KMS is being adopted and used within their technical training process. The technical training process in this case is defined as the education done within the organization to develop knowledge, competencies, and technical skills needed to maintain and repair the products sold to retailers and customers. The technical training process and the KMS will be presented closer in chapter 4. Empirical Findings. In this case study, the application of LMS fills the function of a KMS. Therefore, it is studied as and referred to as a KMS. In Chapter 4. Empirical Findings, there will be a detailed description of how it is applied within the researched context.

The case company is a global company developing and producing heavy material handling machinery in multiple markets around the world. The case company produces different kinds of counterbalanced container handlers and forklift trucks for different kinds of industrial segments, such as terminals, ports, metal industry, and wood industry. The case company will be presented in Chapter 4. Empirical Findings.

1.2 Previous Research
This part of the thesis will present the previous research conducted within the areas of knowledge management (KM) and knowledge management system (KMS). The selected previous research provides an insight into the topic of the thesis and presents what kind of information is already available within the area.

1.2.1 Defining Knowledge Management Systems
As the global marketplace is transitioning into a knowledge-based economy, companies are opening their eyes to investments within KM solutions (Wang & Wang 2016). The increasing value of learning, knowledge, and expertise drives top-management decisions towards implementing KMS in order to capitalize on potential benefits of facilitating knowledge dissemination on a global scale (He et al. 2009; Kuo & Lee 2011; Sher & Lee 2004; Wang & Wang 2016). By highlighting knowledge as a strategic asset, companies have the opportunity to gain competitive advantage by adopting information systems (IS) to efficiently support the development, sharing, storing, and application of knowledge (He et al. 2009; Hung et al. 2005; Lin 2013). According to He et al. (2009, p.176) KMS is defined as:

“ [...] IS designed specifically to support and enhance the organizational processes of knowledge creation, storage/retrieval, transfer, and application.”

Utilizing information communication technology (ICT) and IS for managing knowledge is not unusual. KM-systems are widely implemented as well as commonly occurring in the majority of global organizations (Cham et al. 2016; Gressgård 2015; He et al. 2009; Wang & Wang 2016). Therefore, the field of KM-systems is scientifically researched and generally perceived as a well-studied phenomenon (Halawi et al. 2008; He et al. 2009; Hung et al. 2005). KMS is quite different from other system types since participation in knowledge
sharing processes is more or less voluntary, thus affecting the utilization of KMS (Akhavan et al. 2006; Cham et al. 2016; Gressgård 2015).

1.2.2 Knowledge Management Systems Success Factors

Success factors for KMS’ adoption are greatly represented in existing studies. The research that has been conducted within identifying and understanding success factors for information systems may also be generalized to KMS (Cham et al. 2016; He et al. 2009). However, uniquely, KMS’ adoption is more complex which means that organizations experience more issues with this system category (He et al. 2009; Karlinsky-Shichor & Zviran 2016). There are more determinants and factors that need to be accomplished for KMS’ to succeed in utilization as well as adding value to the company (Cham et al. 2016; He et al. 2009). Therefore, systems with the purpose of managing knowledge have to be treated based on particular characteristics that affect these systems’ success, usage, and benefit (Karlinsky-Shichor & Zviran 2016; Wang & Wang 2016). Thus, the scientific community has generated a variety of success factors that are associated with KMS.

The following Table 1 displays the previous studies which were selected to define and understand the most frequently represented success factors.

Table 1: List of The Used Sources for Success Factors

<table>
<thead>
<tr>
<th>Success Factor</th>
<th>Sources</th>
<th>REP</th>
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</thead>
<tbody>
<tr>
<td>Management commitment (leadership)</td>
<td>(Hung et al. 2005)</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>(Wang &amp; Wang 2016)</td>
<td></td>
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<tr>
<td></td>
<td>(Rezvani et al. 2017)</td>
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<td></td>
<td>(Gressgård 2015)</td>
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<td></td>
<td>(Dulipovici &amp; Robey 2012)</td>
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<td></td>
<td>(Cham et al. 2016)</td>
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<td></td>
<td>(Arntzen &amp; Ndlela 2007)</td>
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<td></td>
<td>(Chong et al. 2010)</td>
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<td></td>
<td>(Okour et al. 2019)</td>
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<td></td>
<td>(Wang &amp; Lai 2014)</td>
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<tr>
<td></td>
<td>(Kuo &amp; Lee 2011)</td>
<td></td>
</tr>
<tr>
<td>Organizational culture and structure</td>
<td>(Hung et al. 2005)</td>
<td>8</td>
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7 (72)
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<tr>
<th>Category</th>
<th>Reference</th>
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<tr>
<td>System complexity (ease of use, simplicity)</td>
<td>(Wang &amp; Wang 2016) (Ritchie et al. 2011)</td>
</tr>
<tr>
<td>Compatibility and conformity (practices, process, values, experiences and workstyles)</td>
<td>(Wang &amp; Wang 2016) (Kuo &amp; Lee 2011)</td>
</tr>
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Hung et al. (2005) conducted a study with the purpose to understand which variables in KMS adoption are considered critical. 32 variables were chosen based on previous research, through a quantitative approach the industry of pharmaceuticals was involved.
Questionnaires were sent which resulted in 98 participating companies. The data collected were utilized to identify the factors that were deemed critical for KMS success. 32 variables became 7 critical success factors, benchmarking strategy and knowledge structure, the organizational culture, information technology, employee involvement and training, the leadership and the commitment of senior management, a learning environment, and resource control, and evaluation of professional training and teamwork. These factors are then discussed, yet, Hung et al. (2005) suggest for other researchers to further explore KMS success factors within the pharmaceutical industry. However, the success factors found in regards to KMS are industry-specific. Different studies identify and discuss similar factors. (Hung et al. 2005)

On the same assumptions, Wang and Wang (2016) suggest that KMS is difficult and risky to implement. In order to mitigate these difficulties, system particular success factors are required to understand what truly affects KMS success. Hence, Wang and Wang (2016) developed a conceptual framework based on the diffusion of innovation and technology-organization-environment framework. The study gathered data from 291 businesses, resulting in a factor and relationship analysis between three main categories of KMS success factors; Technical Innovation Factors, Organizational Factors, and Environmental Factors. It was found that the following factors critically affect success for KMS; perceived benefits, complexity, and compatibility, top management support, organizational culture, and competitive pressure. Hence, these factors are suggested to implicate the future adoption of KMS for any industry. (Wang & Wang 2016)

1.2.3 Learning Management System as A Knowledge Management Tool

The learning management system (LMS) is the main system used in academic applications in supporting educational processes for knowledge creation and development. LMS provides a virtual environment in which the user can access courses, material, training programs, and various training tools (Ritchie et al. 2011). The application of an LMS platform allows knowledge transfer and sharing with digital delivery, which is efficient for knowledge dissemination in global contexts. However, LMS in most applications is used to facilitate the creation of both explicit and implicit knowledge, enhancing learning outcomes. In addition to the benefits mentioned above, the considerable upside of adopting a learning management system is its capabilities of acting as a tool for KM. The value-adding potential of these systems has caught the eyes of global organizations and is now considered as a profitable solution concerning training and competence management. The industry applications of LMS differentiate themselves in many ways since companies require system functionalities that support operational and strategic processes. Supporting knowledge-creating, sharing, storing, and transfer processes brings forth the resemblance to the purpose of KMS. Hence, LMS may occasionally be deployed in order to reinforce KM processes. (Ritchie et al. 2011)

Learning management systems functionality frequently gets incorporated into KMS. These systems share variously related or even identical functions and purposive applications. Similarly, they provide enhancement of the organizational processes for KM. Combining these system types creates a make-up of a complete system that covers all the different user
bases and perspectives, becoming a fully integrated solution for KM. Knowledge development and learning are a substantial factor in KM strategy. Therefore, LMS and KMS are observed as equals, merely with minor distinctions based on application and system design. (Maier, 2007)

1.3 Problem Definition
In order to give the reader a better understanding of why this research needs to be conducted, both the practical problem and scientific problem are defined and described.

1.3.1 Practical Problem
In the third quarter of 2019, the case company decided to implement LEARN for all employees to get access globally. The system was received reasonably well across the company. However, LEARN is divided into two contrasting parts. One part is available for all the organization's employees, and on the other hand, there is a particular part that mainly supports training operations. This set of modules was specifically intended to make global training and knowledge sharing processes more effective by providing training departments and frontlines new tools and possibilities for developing knowledge. The technical training process which serves to develop knowledge for technicians internally and externally now has a digital tool allowing the training stakeholders to manage, organize, and coordinate the process. LEARN brings an abundance of new opportunities for the company to develop competencies in new ways. However, the case company faces an identical predicament as countless other companies, experiencing low levels of use for a recently implemented KMS. The system's utilization was perceived to be particularly low for the technical training process. There are likely many different factors that have caused the system to remain underutilized. Therefore this study serves to investigate and understand why LEARN has a low rate of utilization within the technical training process.

1.3.2 Scientific Problem
According to previous research, there are countless value-adding properties in adopting a KMS. Nevertheless, organizations encounter obstacles to achieve their proposed outcome (Gressgård 2015; He et al. 2009; Lin & Huang 2008). Even though issues with KMS adoption have been investigated in prior studies and organizations devote significant resources to apply KMS in business processes, the factors that play an essential role in succeeding have not received enough attention (Akhavan et al. 2006; Cham et al. 2016; Gressgård 2015; He et al. 2009; Hung et al. 2005; Lin & Huang 2008). Further analyzing these factors could yield great significance within the branch of heavy industry while adopting KMS. Hence, it is necessary to identify factors affecting KMS adoption in a global and industry-specific context, together with their effects on KMS. In addition, previous research has emphasized the technical aspects of the system in examining their success (Kuo & Lee 2011; Ritchie et al. 2011; Wang & Wang 2016), but there may be a need to include other factors (organizational, individual) as well, giving a complete contextual understanding of KMS adoption (Cham et al. 2016).

1.4 Purpose and Research Questions
This part of the thesis will present the purpose of the research and the research questions that have been formulated in order to fulfil the purpose.
1.4.1 Purpose
The purpose of this research is to identify and understand the different factors affecting KMS adoption and utilization for the technical training process. This is achieved by capturing the individual perspectives and experiences from the intended system users and management, within the technical training process. The contextual findings will contribute to combine the identified factors with affordance theory, displaying relationships between the factors and the stages within the affordances process. Hence, providing the research community with a conceptual framework regarding KMS adoption and utilization from a process-specific perspective within heavy industry. And on the other hand, provide the case company with understanding regarding the factors that have to be considered going forward.

1.4.2 Research Questions
The following research questions are the basis for this thesis and the empirical findings collected around them.

*RQ1*: Which factors affect the KMS adoption for the technical training process?

*RQ2*: How do these factors affect the utilization of the adopted KMS?

1.5 Delimitations
To be able to conduct this research some delimitations have been set up to define which areas are being researched. These delimitations make the area of research more tangible and fit into the time frame of the thesis course. This part will present which perspectives have been excluded from the research.

This study did not focus on the usage and adoption of the entire system, only the adoption of KMS within the technical training process. Further, not all system stakeholders or users are sampled, even though they are users of the selected part of the system in different kinds of ways. Not all market areas, countries, and regions have been represented either. Finally, this research did not examine if there were any effects regarding how the implementation was conducted.

1.6 Target Group
The main target group of this research is the organization under study, which seeks to acquire deeper knowledge on the topic. Hence, current knowledge on the topic has to be enriched along with discovering the practical obstacles and their causes. Moreover, multiple stakeholders are expecting to receive scientific perspectives regarding KMS adoption. The primary target group includes the top-level management representatives, training managers, product managers, and owners, as well as operational management for services. The mentioned target groups are positioned globally and share a common ambition to get a grasp on adoption issues.

The purpose of scientific research is for it to be applicable and generalizable to related or comparable circumstances. This study can then be shared with companies or individuals who wish to gain knowledge and learn from previous experience, to achieve a better
understanding or outcome when finding themselves in a similar situation. Accordingly, this research aims to procure its place as the knowledge that can be expanded upon, and bring benefit to others, along with contributing to the plethora of KMS research. However, this thesis is targeted towards companies within the heavy industry who seek knowledge regarding KMS applications within comparable contexts.
2 Theory
This chapter will present the theories and concepts of this thesis. The chapter is divided into the following sub-chapters: Affordance Theory, and success factors in KMS adoption and use. The aim is to give an overall understanding of the topic and present the current knowledge as well as definitions of different concepts. Concluding with the presentation of a conceptual framework.

2.1 Affordance Theory
Affordance theory, or “The Theory Of Affordances”, explains psychological aspects that affect how people perceive physical objects, their various offerings as well as perceived value and meaning. Gibson’s point of view was that the interaction between an actor and its environment affects the behavior of the actor. (Gibson 1986; Pozzi et al. 2014) Hence, the interaction is affected by the characteristics of both the actor and the environment, as well as by the conditions of the surrounding (Gibson 1986; Jones 2003). “Affordance” is seen as a phenomenon suggesting how an object can be used or interacted with, meaning the conditions for an activity. However, it does not assume that a specific activity will be performed. The outcome of the interaction is considered to depend on the experience, knowledge, and understanding of the actor. Therefore, the actor’s perception of a phenomenon different offers influences the potential outcome of the interaction. The main aim of the affordance theory is that every object/artifact has an already ready affordance to be interpreted by the individual engaging with the artifact. (Gibson 1986; Pozzi et al. 2014) The individual will see the object and can without having to do a calculation see what kind of an affordance they will get from the object. It’s preprogrammed with what affordance the object offers (Jones 2003).

Moreover, researchers propose that there is a distinction between potential affordances and functional affordances within Information Systems (IS) and Information Technology (IT) research (Leonardi 2011; Leonardi 2013; Markus & Silver 2008). Functional Affordance defines how an actor can interact with an artifact based on what kind of intention and knowledge the actor possesses (Leonardi 2011; Markus & Silver 2008). Hence, Affordance Theory is also applicable when studying IT/IS systems (Leonardi 2011; Markus & Silver 2008). Generally, information systems offer different intangible properties that facilitate actions based on contextual settings and how they are utilized within the context (Markus & Silver 2008). Even if an IS-system offers a set of invariable functionalities to every user, thus, how the offering is perceived differs from individual to individual (Leonardi 2011; Markus & Silver 2008).

2.1.1 Affordance Theoretical Framework
As mentioned, Affordance Theory has been popularized by researchers within IS/IT (information systems) as it explains how the system-users perceive different offerings. The model below (Figure 1) was proposed by Pozzi, Vitari and Pigni (2014), and it describes processes, concepts and relationships included in the “Affordance Theoretical Framework”.

13 (72)
The Theoretical framework presented by Pozzi et al. (2014) features a four-step process containing Cognition Process, Recognition Process, and Behavior, which results in the Affordance Effect. In this model, the boxes marked with dotted lines represent the process in which the constructs within are ascribed to. The relationships between constructs are tied together with arrows displaying how specific constructs indicate a temporal-causal relationship. Moreover, the model includes taking into consideration entities and actors which are dedicated to executing the affordances process. (Pozzi et al. 2014)

2.1.1 Cognition Process
Firstly, the Cognition Process combines actors/entities (Organization) and object/artifact (IT-Artefact), which are determined by the intention to perform the Affordances Process. Hence, the relationship between Organization and IT-Artefact is dynamic, influencing one another. (Pozzi et al. 2014) Pozzi et al. (2014) describe how referring to “organization” instead of individual, provides researchers with the ability to adopt an affordance perspective while studying business units or business processes. This enables IT/IS research concerning the interaction between human activity systems and IS. Hence, contributing to understanding the human ability to identify affordances in relation to the actual existence of affordances. Therefore, This phenomenon is defined by Pozzi et al. (2014) as;

“Affordances are action potentials arising from the capabilities and goals of the organization and the features of the IT artifact in a unique way where both are equally needed.” (Pozzi et al. 2014, p.7)

Concisely, the organization’s capacity to comprehend and identify the IT potentials encompasses the “Affordances Existence” within the theoretical framework (Pozzi et al. 2014).
2.1.1.2 Recognition Process
The Recognition Process includes the construct of Affordance Perception. It is required for the organization to perceive the affordances in order to utilize them, and hence, attain inherent benefits. Affordance Perception is related to Affordance Existence as the perception and recognition of affordances are determined by the IT/IS features, organization's capabilities, organization's intentions, and external information. However, the perception of an existing offering does not necessarily have to be possible to distinguish and fathom right away (Hutchby 2001 cited in Pozzi et al. 2014, p.7). Pozzi et al. (2014) explain that the organization's unique traits influence how potentials and opportunities of action are perceived. Thus, the Recognition Process is portrayed as;

“[…] recognition of affordance is analyzed as the relationship between a specific actor and a specific system.” (Pozzi et al. 2014. p.7)

2.1.1.3 Affordance Actualization (Behavior)
At this stage, following the Affordances Theoretical Framework, the organization has perceived the existing affordances which the IT-artifact provides (Pozzi et al. 2014). This implies that received potentials can be exploited through action and interaction (Strong et al. 2014 cited in Pozzi et al. 2014, p.7). Moreover, the advantageous actualization of affordances is known as a continuous process made up of strategic intentions and behavior to realize the system’s full potential (Leonardi 2011; Pozzi et al. 2014). As a complement to the construct of Affordance Actualization, Leonardi (2013) further explored the process of actualization related to organizational and group behavior. Leonardi (2013) reveals that organizational motives to take advantage of IT/IS are shared between all individuals within the organization, thus creating a new concept “Shared Actualization”. Shared Actualization pertains to the individuals in the organization agreeing upon conforming to utilize a similar set of affordances, resulting in matching interaction with the IT-artefact (Leonardi 2013). Hence, organized actualization of affordances allows companies to realize the IT-affects benefits (Leonardi 2013; Pozzi et al. 2014).

2.1.1.4 Affordances Effect
The last construct within the framework is Affordances Effect. Affordances Effect shares a direct relationship with Affordance Actualization as the actuation of affordances causes an empirical effect. This denotes the result produced by acting upon and utilizing the IT-system. Pozzi et al. (2014) suggest that previous research seems to propose two significant categories of effects. The first effect alludes to causes resulting in immediate and direct outcomes, in a short amount of time (Strong et al. 2014 cited in Pozzi et al. 2014, p.8). Secondly, on the other hand, there are long term effects that serve to realize organizational strategies. These effects are caused by affordances actuation over a duration of time, systematically achieving organizational goals (Strong et al. 2014 cited in Pozzi et al. 2014, p.8). Furthermore, Pozzi et al. (2014) propose that affordances actualization yield three possible effectuation outcomes, such as facilitating circumstances for additional affordances, the development of additional IS features, as well as enabling organizational transformations.
However, understanding the affordances actualization process in terms of how the proffered effects are valuable (Pozzi et al. 2014). This supports theoretical explanations of organizational innovation through the implementation of IT/IS (Leonardi 2013; Strong et al. 2014 cited in Pozzi et al. 2014, p.8).

2.2 Success Factors for KMS Adoption and Utilization
The success factors that will be used for this research are listed below, each factor plays an important role to expand knowledge associated with KMS adoption and use. They are selected based on their representation in previous studies and their fit to the purpose of this thesis based on this specific case study. Hence, these factors are considered to be theoretical concepts supporting the analysis of collected data.

2.2.1 Management Involvement
As presented in most studies, top-management and leadership involvement is considered to be an agreed-upon factor which affects KMS adoption (Arntzen & Ndlela 2007; Cham et al. 2016; Chong et al. 2010; Dulipovici & Robey 2012; Gressgård 2015; Hung et al. 2005; Okour et al. 2019; Kuo & Lee 2011; Rezvani et al. 2017; Wang & Lai 2014; Wang & Wang 2016). The extent of influence and commitment of leadership is recognized to be a driving factor in successful systems implementation, supportive leadership and management is needed (Okour et al. 2019; Wang & Lai 2014). Management support guarantees that adequate resources are provided for upholding and encouraging system related activities (Wang & Wang 2016). The role of management also impacts the adoption of the systems by communicating its usefulness and benefit, decreasing resistance from employees and supporting in resolving problems (Rezvani et al. 2017; Wang & Wang 2016).

The managerial support function as a success factor in KMS’ is defined by the culture and environment that motivates employees to contribute to the organizational direction and strategies, as KMS are implemented to support the employees in daily work activities and at the same time attain increased efficiency (Dulipovici & Robey 2012; Hung et al. 2005; Wang & Wang 2016; Cham et al. 2016). Research emphasizes that management involvement has a positive effect on KMS’ adoption, hence, KMS’ success is dependent on a balanced combination of factors (Cham et al. 2016; Hung et al. 2005; Kuo & Lee 2011; Okour et al. 2019; Wang & Wang 2016). It has also been shown that leader involvement as an organizational factor holds great significance as it brings about evident impact on other factors related to utilization and success, such as employee involvement and empowerment (Arntzen & Ndlela 2007; Chong et al. 2010; Gressgård 2015; Wang & Lai 2014).

2.2.2 Organizational Culture and Structure
Previous research highlights the importance of the organizational environment, culture and structure for succeeding with KMS adoption. New technologies and information systems are implemented into human activity systems, but often their application fundamentally changes work activities (Akhavan et al. 2006; He et al. 2009). Therefore, an adequate plan needs to be introduced to manage change within the organization, processes, behaviors, and structures need to be reorganized (Akhavan et al. 2006). Organizations lacking in
leadership, change management and positive culture will experience noticeable resistance
to the system adoption as well as increasing distrust towards management and other negative
effects. The influence of the organization itself also brings forth challenges with KMS
adoption. (Akhavan et al. 2006; Hung et al. 2005).

There are organizational features and characteristics that can impede, or contrarily have a
positive impact on the KMS adoption (Hung et al. 2005; Wang & Wang 2016). The size of
the company might have an impact on the overall success of information systems since
larger organizations are structured in a way that places departments in different parts of the
world (Gressgård 2015; He et al. 2009; Hung et al. 2005). This makes the system’s success
more crucial to operations as it is the connection between departments, therefore, globally
adopted systems seem beneficial and important (Gressgård 2015; Hung et al. 2005). Hence,
organizational size could have a disrupting effect on cultural aspects, since larger
organizations have policies limiting resource utilization. Restrictions regarding resources
impact the learning and collaboration environment, which is dependent upon participation.
Furthermore, organizations with a large number of employees need administrative measures
to decide who can participate based on the position at the company. (Hung et al. 2005)

Research claims that organizational culture is the driver for knowledge transfer and sharing
processes allowing knowledge exchange between individuals and departments to achieve
Wang & Wang 2016). Social and cultural structures should therefore not be neglected in
order to attain the benefits of KMS (Gressgård 2015; He et al. 2009). Moreover, Wang and
Wang (2016) state that an appropriate organizational culture for KMS adoption consists of
a set of cultural requirements. Being that, the employees are encouraged to share knowledge,
freely seek new knowledge as well as being inspired to innovate and learn (Wang & Wang
2016).

2.2.3 Employee Commitment
Previous studies have also shown that the employee’s participatory role in KMS adoption
is critical, the entire organization has to be involved (Hung et al. 2005). The organizational
culture, as well as leadership, has to facilitate involvement, empowerment, and commitment
in order for the employees to utilize the KMS (Akhavan et al. 2006; Hung et al. 2005;
Wang & Wang 2016). Additionally, generating motivation of use can be accomplished by
providing comprehensive tools and training, which assists in teaching the employee how to
utilize the system effectively (Arntzen & Ndlela 2007; Gressgård 2015; He et al. 2009; Hung
et al. 2005). Furthermore, understanding the system’s usefulness towards enhancing job
performance could be a motivator for the employees (Hung et al. 2005). Employee
involvement has also been proved to be affected by the provision of incentivized utilization
(He et al. 2009). The incentives could be extrinsic motivators, such as economic incentives
or reputation and status (Gressgård 2015; He et al. 2009). As well as stimulating interest
through creating contests that highlight prolific employees, along with giving them
corresponding rewards (He et al. 2009). But, most employees are motivated based on
intrinsic benefits such as personal growth (Gressgård 2015).
2.2.4 Perceived Benefits
KMS are adopted according to several different factors, the most prevalent reason for innovation is that the adopting organization perceives the system as highly beneficial (Dulipovici & Robey 2012; Wang & Wang 2016). Though a system can be recognized as profitable by decision-makers, it does necessarily convey the employees’ understanding of the KMS benefit (Wang & Wang 2016). The user’s practical benefit in utilizing the KMS is a determining factor for reaching success (Dulipovici & Robey 2012; Ritchie et al. 2011; Wang & Wang 2016). There is a distinction between potential benefits and practical benefits (Dulipovici & Robey 2012; Karlinsky-Shichor & Zviran 2016). In order for the KMS to support knowledge-creating, storing, and sharing processes the potential benefits need to be abundantly clear (Arntzen & Ndlela 2007; Karlinsky-Shichor & Zviran 2016; Wang & Wang 2016).

2.2.5 System Complexity
The KMS complexity is defined as “The degree to which an innovation is perceived as relatively difficult to understand and use.” (Rogers 1983; Zhu et al. 2006 both cited in Wang & Wang 2016, p.831). This pertains to the organization’s IT competence, if the intended users are competent users of IT/IS the system can be more complex (Wang & Wang 2016). When users identify that the KMS is incomprehensible and challenging, thus, the adoption can be negatively affected (Ritchie et al. 2011; Wang & Wang 2016). In addition, inadequacies in the user interface design also affect KMS success (Damodaran & Olphert 2000 cited in Wang & Wang 2016, p.839). Therefore, systems need to be adapted accordingly with the right level of complexity (Wang & Wang 2016).

2.2.6 Compatibility and Conformity
KMS does not only have to be tailored to the user’s IT competence, but it is also required to assure the utilization of a KMS is compatible with practices, processes, and workstyles (Kuo & Lee 2011; Wang & Wang 2016). Allowing system compatibility in its application context shortens the learning process for the user, which in turn grants anticipated usage of KMS (Kuo & Lee 2011). In a different circumstance, where IT does not conform or is incompatible with practices, it may alter work processes forcing employees to conform to the system instead (Kuo & Lee 2011; Wang & Wang 2016). Instead, this negatively affects KMS adoption, as the user is obligated to accommodate new practices resulting in dissatisfaction (Kuo & Lee 2011).

2.3 Conceptual Framework
Every information system offers the same set of functionalities for each of the users; what the users perceive to be beneficial and useful varies from user to user (Markus & Silver 2008). The Affordance Theory brings to light users’ different perspectives in perceiving what is true and valid for each object they interact with (Gibson 1986; Pozzi et al. 2014). With previous research, it has been highlighted that organization and system are interconnected; hence these two concepts should be studied collectively in order to get the whole situation perspective (Zammuto et al. 2007). As a complement to the Affordance Theory, different kinds of success factors have been added to the different processes, to
broaden the pictures in the way Zammuto et al. (2007) suggested, such as keeping both organization and system concepts in mind when researching in the IS/IT context. The combination of these different theories is to demonstrate how the different users’ perceptions vary, and if the different success factors have a small or big effect on the actual usage of the LEARN system. Hence, the perceptions of a situation concerning different success factors will varydepending on the user and context.

By linking these theoretical concepts together, it has been possible to gain a deeper understanding of the organization, the technical factors, and perceptions. It was also possible to identify how different perceptions differ from one another. The conceptual framework (Figure 2) has been used to understand the system and its surrounding context including its affordances and the different success factors. Further, by combining these theories, it was easier to understand the connection between affordances and the success factors behind KMS adoption and utilization.

The conceptual framework shows (figure 2) how the concepts and theories were interconnected for this specific study and how they were referred to throughout the thesis in relation to the purpose. Hence, identifying and describing the theoretical connections between KMS success factors and Affordance Theory. The updated version of the framework (Figure 8, Upgraded theoretical framework) is discussed in Chapter 6.1.1 Proposed Conceptual Framework.

Figure 2: Conceptual Framework (created by the authors).
3 Methodology

This chapter will present and discuss the reasons for selecting the specific research approach, design, and methodology of this thesis. Further, data collection and data analysis methods will be described as well. Additionally, criteria to evaluate the quality of the thesis together with the ethical considerations will be introduced and discussed.

3.1 Research Approach

In research, there are two distinct research approaches, these provide two adherently different ways in which the relationship between theory and research is perceived. These two approaches guide the research process phases and are known as deductive and inductive. The formerly mentioned, deductive approach, is based upon theoretical ideals of what is already known within previously researched contexts and phenomena. It is from preconceived notions that research questions and hypotheses are formulated, which need to be empirically tested. As a consequence of conducting deductive studies, theoretical constructs can be confirmed and disconfirmed. On the other hand, in an inductive approach, the theory is the outcome of the research. Therefore, this approach is based on the inquiry of qualitative data, which generates theoretical concepts. (Bell et al. 2019) However, research cannot be purely deductive or inductive, because individuals still have predetermined constructs of how the world works. Therefore, having previous knowledge affects the research, it is not possible to be neutral in selecting previous theories and collecting data. For these reasons, there exists a third type of research approach known as abductive. It is a combination of both deductive and inductive approaches, which overcomes their limitations. The goal is to explain a phenomenon that existing theory has not been accounted for. Hence, the empirical findings would provide a new or different understanding of a specific phenomenon. (Mantere & Ketokivi 2013)

This thesis has followed a more abductive research approach because it allowed constant movements between theory and empirical data, providing a clearer understanding of what it was researching. Moreover, it was considered appropriate to this study because during data collection and analysis there was a constant revision of the theory. Concluding, Chapter 2. Theory was modified based on the empirical findings to explain the results. The chosen approach made it possible to properly answer the research questions to fulfill the purpose of this study. This was allowed by analyzing and identifying patterns within the empirical data and associating them with the theoretical concepts and constructs. The abductive approach allowed the researchers first to conduct a literature study to gain knowledge about how KMS has been studied previously. Hence, a theoretical world view was created. The questions that were asked while collecting data within the empirical context were based on existing knowledge. However, to further understand the empirical content, another theoretical investigation had to be carried out. The concepts and theories were revised to be able to define and analyze the data. Subsequently, more interviews were conducted. When the data collection was complete, a final revision was made, which led to the outcome according to the purpose. This process was fluid, enabling flexibility throughout the research period.
3.2 Research Method
In order to conduct business research, it is possible to use two different research methods, quantitative and qualitative. The quantitative research method gathers quantifiable or numerical data and tests hypotheses formulated from current literature concepts. (Bell et al. 2019) On the other hand, a qualitative research method is based on collecting and analyzing non-numerical data, focusing on understanding, openness and the individual interpretation of reality (Jacobsen 2002). Further, the theory of qualitative research is generated from the collection and analysis of the data which can be collected through in-depth interviews and observations (Bell et al. 2019).

A qualitative research method has been preferred and selected for this thesis since it contributes to in-depth information and knowledge of the investigated phenomena. Further, it has been chosen because it allows technical trainers and managers to express their own thoughts, opinions, perceptions and experiences.

3.3 Research Design
The research design of a study refers to the logical order which binds the empirical findings to the research’s initial research question and its results. A research design is based on the type of research question that the study needs to answer. Therefore, the structure of the research question provides a sort of guideline to identify and select a suitable type of research design. Determining the appropriate design makes it possible to conduct an in-depth research within a specific context and on a significant phenomenon. (Yin 2018)

Hence, a single case study research design has been chosen for this type of thesis. It has been considered a suitable way to conduct this type of study because the research is mainly focused on examining and comprehending an existing phenomenon in a real-life organizational context in-depth (Yin 2018). A single case study also provides a detailed analysis of the singular case under question which is then used for examining and answering the research questions of the thesis in-depth (Bell et al. 2019). Additionally, according to one of the five rationales presented by Yin (2018), a single case study research design is considered appropriate when the research goal, as it is for this specific study, is to describe and illustrate the circumstances and conditions of a common situation. Hence, this single case study has been regarded as a representative case (Yin 2018).

As a part of the research design, through the research questions, it is also possible to determine what and who the single unit of analysis is (Yin 2018). As well as what type of data gathering methods and data analysis methods are adopted for developing crucial results. Hence, the research has been conducted on a global organization operating within heavy industry, from which it was possible to analyze and understand the specific social context in-depth (Bell et al. 2019). This single case study facilitated the analysis of the factors affecting KMS adoption within a technical training process.
3.4 Sampling
To be able to make sure that relevant and valuable data is extracted, the particular aspects need to be researched. The research objectives can only be achieved by selecting “the right representatives”, therefore it is crucial to identify the most fitting participants. Since time limitations create urgency for collecting empirical data, purposive sampling has been considered the most appropriate sample selection method. Employing *purposive sampling* provides a systematic approach in order to find data that is purposeful for analysis with respect to the established research questions. (Bell et al. 2019)

Purposive sampling is a form of non-probability sampling, which does not offer to sample respondents in an aimless or unplanned manner. Therefore, practicing purposive sampling means that the selected individuals do not represent a population or categorized groups. (Jacobsen 2002) This decreases the generalizability of empirical findings collected, however, it is an action of assuring the relevance and usability of the data. Purposefully selecting participants that are likely to provide a suitable perspective of the intended field of research requires the researchers to carry knowledge regarding the individuals within a department, site or work-role. (Bell et al. 2019)

Therefore, for this single case study a small sample, which is a segment of the individuals that are selected for investigation (Bell et al. 2019), has been identified as participants for this analysis. It consisted of a single-unit of analysis (Yin 2018), which in this case included technical trainers, managers, and technical training coordinator of the organization’s global technical training department. This unit has been considered suitable to be analyzed for gaining deeper knowledge and understanding of KMS usage in the technical training process. Therefore, the focus group of the thesis consisted of four technical trainers, three managers, and one technical training coordinator who were directly working with the technical training process.

3.5 Data Gathering Method
In qualitative research, there are different methods for collecting data that are needed for the study, such as for instance, interviews, observations, document studies. However, since, the thesis seeks to collect significant information as well as understand the respondents’ opinions and different points of view, an interview data collection method has been selected. Particularly a semi-structured interview approach has been preferred and adopted. The interview is considered to be a two-way communication, where the interviewer asks the interviewees questions related to the study’s topic within a formal context. (Bell et al. 2019)

Further, interviews can be conducted in different ways, in groups or individually, over the phone, face to face, or through other interactive digital platforms (Bell et al. 2019). For this study, respondents have been interviewed individually and with a voluntary-based approach. Each interview lasted between 45 to 60 minutes (*Appendix 5*) in order to get enough and detailed information. The interviews were conducted via Google Hangout video conferencing platform and were recorded with the permission of each respondent. The interviews have been recorded because it is easier to concentrate on the interviews rather
than on taking notes. Furthermore, it also allows the transcription of the information which is going to be analyzed. (Bell et al. 2019)

The data collection was based upon four interview guides that were developed using established guidelines provided by Bell et al. (2019). This facilitated the planning of the interviews in advance generating a schedule and important questions that needed to be asked. The interview guides were considered an important ‘tool’ since they reduced the risk of missing data. Hence, the interviewers did not forget to ask any of the topically elected interview questions. The interview guides were divided into distinct parts. Further, the questions were written following a specific structure, starting from general questions regarding the individual and their working process, later arriving to ask questions that highlighted the research topic. This created a linear flow during the interviews. Additionally, the guides included a combination of probing and direct questions, in order to efficiently acquire relevant and in-depth data. When needed follow-ups questions were asked based on the participant’s replies, these were generally asked to clarify the reasoning. In addition, Swedish was selected as a common language for conducting the majority of the interviews, specifically five, in order to avoid as many misunderstandings as possible. (Bell et al. 2019).

Swedish was preferred since the case study is carried out within a predominantly Swedish department. However, three interviews were conducted in English because three of the interviewees were situated in the United Kingdom and did not speak Swedish. In Appendix 5 all the respondents have been given a “tag” that has been used throughout the thesis. This tag made it possible to refer to a specific interviewee while presenting findings, and this enabled the comparison between different respondents related to their titles and responsibilities.

3.5.1 Data Gathering Process
The model below (figure 3) displays the workflow during the data gathering process. As already mentioned in the 3.5 Data Gathering Method Chapter, four interview guides were developed to conduct semi-structured interviews. Initially, two separate interview guides were built, though, sharing similar questions but slightly adjusted toward two different respondent categories. They were modified to collect the appropriate data from the “Trainers” (Appendix 1 and Appendix 2) and the others geared towards capturing “Management” perspectives (Appendix 3 and Appendix 4). These separate guides were used during the first four interviews. After these four interviews were carried out, the transcriptions were made immediately. This was purposely decided for this thesis in order to get an overview of what kind of data was collected. It was beneficial for allowing the researchers to add, change, and modify the interview guides before conducting future interviews. As the interview sessions were recorded, the interviews could easily be transcribed. The transcription activities were conducted meticulously by writing the respondents’ replies word by word, in order so that the interviewees’ perceptions and perspectives were detailed.
The next activity in the data gathering process was adjusting the interview guides going into the last interview sessions, which was done for both Trainers and Management (Figure 3). The adjustments were minor but necessary. Thereafter, the last interviews were conducted, and transcribed.

![Data gathering process](image)

**Figure 3**: Data Gathering Process (created by the authors).

### 3.6 Data Analysis

Qualitative data analysis is considered a sequential process. Qualitative data analysis has characteristics different from other types of data analysis. For instance, it allows simultaneous activities, such as writing down the interviews and collecting data at the same time, which means that data can be gathered and analyzed together. Furthermore, in qualitative research there is a density of information that cannot always be used in its entirety. Hence, there is the need to identify and select significant information for the specific study over others.

For this thesis, the data collected from the semi-structured interviews have been analyzed following the six steps presented in Figure 4:

1. **Preparing and organizing the data**: transcribing the information collected from interviews;

2. **Data immersion**: it consists of looking over and reading the data in order to get an overview of what has been gathered. For instance, it is also possible to notice if there are common views on certain topics;

3. **Data coding**: coding the data means organizing the data. It is conducted by taking the raw data and allocating them into different categories. The categorization process also requires the labeling of data which makes it easier to find them;
4. **Thematicing and describing**: by coding and categorizing it is possible to generate themes or describe the topic or people depending on the type information needed for the specific study. These are key points for a thesis’ findings;

5. **Data representation**: use graphs or charts to represent and display the identified themes and descriptions of the collected data in order to make it more understandable for others;

6. **Data interpretation**: interpret the meanings behind the collected data and understand the gathered information. (Creswell & Creswell 2018)

In relation to this study, once the interviews were conducted, they have been simultaneously translated from Swedish to English, and transcribed word-by-word in order to not face a ‘missing data’ issue. The data transcripts have been read in order to better understand the topics that were discussed in the interviews. Afterward, once identified similar patterns, the data have been divided into categories related to the theoretical concepts (2. Theory). Once the data were categorized, they have been subdivided into themes, and thereafter, they were described according to each individual’s point of view.

Moreover, graphs and tables have been drawn and adopted in order to demonstrate, as a sort of ‘summary’, specific findings in a clearer way. For instance, Table 4 in Chapter 4.5.2 Perceived System Functionalities displays which functionalities each interviewee perceived. These visual tools have been considered significant in data display because they would enable readers to read and comprehend the information in an easier way. Finally, once the empirical findings were identified, analyzed, and described, they were interpreted for finding correlations and meanings between theoretical concepts and the interviewees’ data, allowing then the writing of the conclusions. Following these six steps, enables a
deeper understanding and detailed analysis of the data collected, which, in turn, helped the writing of the conclusions of the thesis by fulfilling the purpose and answering the research questions.

3.7 Quality Criteria
In qualitative research, it is crucial to evaluate the quality and credibility of the study. In order to support the research questions, research gaps were identified through a literature review about the thesis’ topic. This made it possible to link the entire study (research question, findings, and discussion) together with the existing literature. However, in order to find and demonstrate how credible and generalizable the findings are, the quality has been evaluated by assessing two main criteria that include two sub-criteria each. These are validity, internal and external validity criteria, and reliability, which consists of internal and external reliability. (Creswell & Creswell 2018)

3.7.1 Validity
The meaning of validity for qualitative research is to see how accurate the collected data is by using different methods (Creswell & Creswell 2018). There are different ways to assess the internal validity. The thesis should be shared with the interviewees to see if they agree with the data collected and transcribed from their answers or not. This also would make it possible to see if the interviewees’ worldview has been correctly understood and interpreted, which would meet the information provider’s validity aspect of the data. Furthermore, the research should be compared to other studies. Which makes it possible to see if the same conclusions have been reached even if different methods have been used. (Jacobsen 2002) The previously mentioned ways to evaluate internal validity have been included in this thesis. The participants were able to read the thesis before its submission in order to give their feedback. Further, this thesis has been compared with other studies by doing previous research and also by searching for theses with similar topics. Lastly, the selected interviewees had essential knowledge about the topic, which made them a suitable choice for sources in this thesis.

The external validity aspect refers to how and what extent a study is generalizable to different contexts other than the one it was studied in this thesis. External validity can be defined using varied approaches. However, qualitative research does not usually evaluate this aspect. Further, by identifying which units for interviews have been selected. As well as systematically adopting theory and other scientific research to prove the results’ generalizability. (Jacobsen 2002) The possibility of this thesis to be generalized to other contexts is enhanced by the usage of different theories from previous research. The unit selected for this study is the one with the most accurate intel about the phenomenon under study. Moreover, this research can be suitable for other researchers studying a similar context that could support their research process. Additionally, to make it possible for other researchers to adopt and use this thesis’ results the thesis’ context has been described in detail. The thesis described in detail the social setting in which the research took place, events, individuals, and providing sufficient data.
3.7.2 Reliability
Reliability within the realm of qualitative research is to find out if the collected material is consistent with the carried out method and the possibility to have the same study conducted again. The main aim is to find out if the method is consistent and transparent. To make sure the research is confirmable is to show the process behind the data collection and analysis in a transparent way. Other researchers would then be able to see the way this thesis has been conducted. Therefore, each step of a study should be described in detail by adopting different methods to document as much as possible. (Creswell & Creswell 2018) Hence, the data collection and analysis of this thesis have been clearly presented with a graph in Chapters 3.5.1 Data Gathering Process and 3.6 Data Analysis. Showing step by step the procedures. Furthermore, being ‘transparent’ shows that no personal attitudes have been included, leading to entirely objective findings. (Bell et al. 2019) 

The external reliability factor demonstrates if the study can be replicable. It refers to how accurately the processes have been followed and to what extent. By evaluating this characteristic, it would demonstrate if other researchers can replicate the study and if the results they get would be similar to this thesis’ findings. (Bell et al. 2019) Hence, this thesis has continuously been reviewed by two external people. A supervisor and the examiner who checked the research procedures and data analysis to confirm that the conclusions were consistent and, so, replicable. Further, by following the auditors’ suggestions, the external reliability aspect of the thesis has been strengthened.

3.8 Ethical Considerations
Regarding ethical considerations, it is important to be aware that every research is invading an individual’s private sphere. The ethical dilemmas start from when researchers hide either the purpose of the research from the interviewees or subjects participating in the research. People change their behavior and their answers depending on the circumstance they are involved in, such as when they know they are being studied, asked about certain topics, or when they are aware of the purpose of the research. Hence, researchers need to manage ethical considerations, but, there are no clear answers on what to do. Rather, the researchers have to evaluate the losses and gains from while deciding between various ethical approaches. There are three main aspects to be taken into consideration when talking about ethics in research; Informed Consent, Right to privacy and Accurate Presentation of Data. (Jacobsen 2002)

Informed Consent refers to whether the participants have been provided with enough and correct information about the topic and interview techniques prior to the interviews (Jacobsen 2002). This thesis has been conducted with ethical considerations in mind. Therefore, each interview was conducted on a voluntary based approach, according to which each respondent was willing to collaborate in the study. Every interviewee has taken part in the research on its own free will. Additionally, at the beginning of each interview, the participants were informed of the research purpose and were asked for their consent to record the interviews. It was also made clear that only the researchers are allowed access to
the recordings and that they were strictly going to be utilized for transcribing the empirical findings.

Furthermore, the right to privacy aspect refers to not invading the privacy of the participants involved in the research (Jacobsen 2002). To avoid invading the right of privacy, questions related to each interviewee’s personal life were avoided. Hence, in the interview guides, only questions related to their professional life and experience regarding the thesis’ topic were formulated and asked during the interviews. Moreover, the respondents were informed that they could end the interview at any time or not answer questions if they did not feel comfortable. Ensuring the right to privacy means adopting measures for keeping all participants anonymous to impede on the individual's privacy. This can be achieved by hiding all personal information, such as name and title to assure that individuals cannot be affiliated with specific information. Thus, for this study, the individual's right to stay anonymous was a priority. The transcribed information and empirical findings were first made available to be approved by the respondents before releasing the thesis to the public. While conducting this study the aim was to be transparent and open with the approaches that have been adopted as well as the steps that have been taken. In this way, it is possible for other researchers to conduct a similar study reaching similar results. Hence, the research topic, purpose, data collection method, findings, and analysis were presented and described at each step of the research. The information included in this thesis has also been correctly cited from the sources and has not been falsified to better fit the purpose.
4 Empirical Findings

This part of the thesis will present the empirical findings collected during the data gathering process which provide a closer look at the technical training process as well as how the LEARN system works for the organization. Further, significant factors affecting the system adoption will be presented and described.

4.1 Case Company

The company under study is a global company operating within the heavy industry. It consists of approximately 5700 employees in over 100 countries and with a service staff of approximately 1500 workers worldwide. The company provides cargo handling solutions for a number of markets and industry segments, such as logistics (ports, terminal, and distribution centers), forestry, metal industry, and the automotive industry. For maintaining the product quality during their lifecycle, there are services offered to the customer, which can be either under contract or On-Call. The services proposition includes the provision of spare parts and also competencies-based services such as maintenance, optimization, repairing, renovation, reconstruction, upgrades, adjustments, and so forth. The case-company examined in this study is part of an organizational structure owned by a holding company. The holding company acquired three subsidiary companies to claim the ability to provide cargo-handling solutions that cover the full logistical chain. Together, these companies cover On-road, Off-road, and Marine cargo-handling operations.

4.2 Case Background

New visions and goals set on the holding company level prompted investments in software solutions for KM As a part of these strategic goals to gain competitive advantage by developing knowledge, the holding company provided its three subsidiary organizations with a LMS. The LMS is named “LEARN”, and its main purpose is to develop knowledge more efficiently through digitalization. With LEARN, new processes for KM are supported by using data collected from the system's different functions providing employees with self-managed learning tools, webinar training, process training, management training, videos, and other kinds of knowledge development solutions. Also, LEARN fills the function of promoting strategic collaboration cross-functionally, enabling development of strategic solutions together to utilize distinctive competencies within the organization.

Additionally, this LMS provides process digitalization for a variety of operational training services, such as technical training services. LEARN provides a platform connecting customers, dealers, internal actors, and training professionals within the company. The purpose of having this platform is to be able to offer hands-on, classroom, and webinar training more efficiently. Through LEARN, locally performed training services can be administered, monitored, and controlled centrally by the training department, HR and top-management to make sure that the company archives strategic goals regarding KM. Therefore, LEARN is the primary source of global management of knowledge creation, sharing, collection, and application. LEARN referred to in this case study is implemented to function as a tool for KM and competence development on a global scale, with full coverage of all market areas. LEARN is built on modularization, meaning that companies
pick and choose system modules that fit their needs and application areas. The application of LMS fills the function of a KMS, serving as a company wide solution to manage knowledge resources, internally and externally.

LEARN, as an organization-wide KMS, has plenty of functions that act as the interface between distinctive operations. However, the focal point of this study will be its adoption and application for supporting the technical training process. LEARN serves as the main tool for organizing, coordinating, and planning knowledge-generating services, allowing efficient global training. Moreover, the advantage of LEARN, if used, is to gather an abundance of valuable data and information in regards to who possesses knowledge. This provides the opportunity to identify where in the organization there are knowledge inadequacies and knowledge gaps. This compiled data assists the organization in the decision-making processes, which results in the efficient use of resources by prioritization. Also, the statistical data will be valuable to present the key numbers that indicate performance, such as, number of training conducted, the number of people that have been participating in training sessions, and training evaluation scores. The previously mentioned data can also be used to find patterns in customer needs, which supports decision-making processes for developing and providing training solutions.

4.3 Technical Training Context

Technical training is part of the services offering, proposing training services for customers and dealers. Additionally, training services are also required to be conducted internally, developing internal resources. To achieve global coverage, a training organization connects all trainers located in their respective market areas. The organization is supported centrally by a training department. It is an important task to maintain an appropriate level of knowledge of those who secure that the products remain operational and that the promises of uptime are kept. The customer relies on service personnel and technicians to possess the right expertise and knowledge to ensure product stability and quality. Therefore, continuous dissemination of technical knowledge within the company as well as to dealers and customers is required. It is the training department’s responsibility to develop, coordinate, and conduct training on a global level.

It is equally essential to develop and maintain all the trainers’ knowledge. Therefore, there is a concept for knowledge development between trainers’ known as “Train The Trainer”. It is about trainers around the world getting access to new knowledge, primarily regarding new products, major product changes, or software releases. If all market areas have the right technical expertise, the training can be carried out locally by a local trainer, which reduces costs. The context for technical training is based on one central organization with global trainers that create all the basic material for the rest of the market areas around the world. In this central organization, there are support functions in which technical training is developed and then distributed around the world, for the organization to use. It includes presenting statistics, developing the process with technical training, and developing the way of working with the releases of new machines.
In every market area, there are local trainers, but their roles are often entwined with another technical role in the organization. For example, the trainers can work with technical support and technical training simultaneously. The market areas do not have the same support functions as the central organization, meaning when there is a need for statistics, changes in the process, and new material, the central organization is responsible for that. The local trainers are responsible for updating the material to fit the courses and change the language from English to the specific language that is needed. With these combined roles, their process for conducting technical training varies, and the way of working is impacted and adjusted to the other responsibilities that their roles require. Hence, the local trainers are more limited in regards to the time allowed for training activities. Some of the trainers manage the contact with customers, while other trainers let the administrators or sales personnel handle the contact with the customer.

4.3.1 System Types for Technical Training Process

In Chapter 4.3.2 Daily System Usage, for the technical training process multiple different kinds of systems are being used. The usage of the variety of systems adopted depends on what kind of daily tasks the user of LEARN has to carry out. The systems used for the technical training process are as following:

- Drawing 3D viewers for the machines (CAD viewing software)
- Manuals and systems that illustrates machine components
- Enterprise business systems
- Previous knowledge management software
- Microsoft Office applications: Word, PowerPoint and Excel
- Google applications: Sheets, Docs, Slides, Forms and Drive
- Network folders/databases

Since the system utilization depends on what kind of tasks are being conducted, there are other systems in the organization that are not being represented in the list, but rather the system kinds that are relevant for the technical training process. Manager 3 had a view on the number of systems the organization is using:

“ [...] we have a lot of different systems and tools, and I would say that this is something that we as an organization need to work on, how all these systems link together making it more structured.” (Manager 3 2020)

4.3.2 Daily System Usage

The interviewees involved in the technical training process use a lot of different systems on a daily basis, it varies from 2 systems up to 25 systems (Table 2), excluding Microsoft Office and Google applications. “Oh wow, how many are there?” was a comment from Trainer 1 regarding the amount of systems and tools available, and to this Manager 3 stated, “If I were to look at my bookmarks on my computer right now, without over-exaggeration I would say that there is 25-30”. 
Table 2: Amount of Systems Used Daily per Interviewee.

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Amount of systems used daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trainer 1</td>
<td>3</td>
</tr>
<tr>
<td>Trainer 2</td>
<td>2</td>
</tr>
<tr>
<td>Manager 4</td>
<td>3</td>
</tr>
<tr>
<td>Manager 1</td>
<td>1</td>
</tr>
<tr>
<td>Trainer 3</td>
<td>5</td>
</tr>
<tr>
<td>Manager 2</td>
<td>2</td>
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<tr>
<td>Trainer 4</td>
<td>16</td>
</tr>
<tr>
<td>Manager 3</td>
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</tbody>
</table>

Depending on what kind of tasks they are performing, a different need for the system is present. However, the systems that are dependent on each other’s information are not efficiently integrated (Manager 3 2020). Meaning that two systems that could have the benefit of working together, do not have that kind of integration today. The respondents mention that the systems they adopt serve the same purpose, for example, Microsoft PowerPoint or Google Slides. With the kind of work they do, there is a need for updated information, various systems to find the information they need as well as to communicate with people or customers within and outside the organization. Manager 2 commented on people’s attitude towards the adoption of new systems in the organization “People are saying: “Ah, not another system”.

4.3.3 LEARN Functions
LEARN consists of many more functions than those who are present in the system today, and these functions will be presented further in this section. Manager 2 said “... We have
scaled it down and taken away the majority of functions to make it easy and basic”. For example, some functions that have been removed are different kinds of forums or add-ons to get other types of functions in the system.

But the functions that are available are the options to upload material to the internal database. This material can be downloaded to your own computer and changed after what kind of training you need. Or the possibility to update the material when new information has been released. To create a new course in LEARN you create an event, the event consists of course goals, has a course code, syllabus and the material needed to do the course. To be able to conduct a course in LEARN, you invite the participants to this session which consists of an event. The session includes information about which trainer, who is participating, the cost of the training, the place for the training, at what time and so on. Administrative information about the training is included in the session while the event is the information about what kind of training is being conducted. By adding a session to LEARN, it is also added to the calendar which makes it possible to plan and organize the training sessions in the local or global organization.

Once a session is done in LEARN, there is the possibility to create a questionnaire related to the specific event the participants just have been educated on. This is for the possibility to check what the participants have learnt during the event or if someone is not eligible for the certificate to be printed from LEARN. By doing the sessions in LEARN the participants, the events they have taken part in and what kind of certificates they have are stored to be able to go back and see what courses a technician has done. This function exists to be able to store and find the statistics from the training done around the world. The previously mentioned functions manage face to face training, but there are also E-learning capabilities available in LEARN. These E-learning courses can be uploaded to the LEARN and be done whenever it suits the users. Moreover, E-learning enables the opportunity to combine classroom training with E-learning modules, creating so-called "Blended learning". Before participating in classroom training, all participants must go through specific E-learning modules and tests to ensure that they have the right level of knowledge before attending. Blended learning makes physical training more efficient, saving valuable time which can be spent to do in-depth training.

4.3.4 LEARN Introduction and Information
LEARN was firstly introduced by the top managers and Human Resources, to the direct managers. Manager 4 commented that “[...] HR wanted to keep track of people’s competencies.” as a main reason behind why LEARN was introduced. For the trainers it was the closest managers, participating in this study as well, who communicated the information about LEARN. Additionally, there was an information session for the different trainers around the world as a first introduction and how to use LEARN before it was released, also the possibility to use a pilot system to try out before LEARN was launched. There were split views in how much information the interviewees has been given and how the introduction of LEARN has been presented, some of the interviewees feel that they have gotten all the right information and introduction, while others feel that they have not really
been given the time to sit down and really get to know LEARN. However, all of the respondents have gotten information about the system before it was implemented.

There is a varied amount of usage of the system among the respondents, which will be presented closer in Chapter 4.4.3 Actual Utilization of LEARN. However, this has an effect on the way the respondents feel about introduction to the system and has a need for more information about the system. There has been an initial presentation to all the respondents from different kinds of sources and has been presented during a global meeting with focus on how the system works.

4.4 The Technical Training Process
There are three different ways in which the technical training process (Figure 5) can be initiated:

- The customer or dealers has bought a new machine and their technicians or employees wishes to be provided knowledge regarding the machine;
- Internal training, which means training the technicians employed by the organization and can be conducted when new products are launched or to refresh the memory of the technicians;
- External training is for technicians employed outside the organization but require the need for similar technical training.

Figure 5: Technical Training Process (created by the authors).

Once a training request has been received, a quotation is prepared for the customer, including: price, location, duration, and content. However, not all quotations result in technical training, it has to be agreed upon by the customer in question. Further, once a quotation is accepted, the structure around the technical training is created. This is where it is decided what kind of courses are needed, the participants' previous knowledge, where the training will take place, and possible dates fitting both trainer and customer. This process
transpires when there are external needs for technical training, specifically for customers or retailers. However, when the internal organization demands technical training, no quotations are created.

Furthermore, once everything regarding the technical training sessions is confirmed, the trainer obtains suitable training material. Generally, there is material available for technical courses, but oftentimes the material needs to be adjusted to be adapted to the participants, factoring in previous experience and knowledge. The global technical trainers create the material since they collaborate with the research and research & development departments (R&D). This material is distributed through different channels such as LEARN, Google Drive, or E-mail. Once the material has been reviewed and updated by the trainer, the training is ready to be conducted. Technical training can be arranged digitally through LEARN, or as classroom training, face to face. When the training sessions have been successfully conducted, the participants' knowledge needs to be verified in order to measure the training outcome. Hence, questionnaires or tests have to be filled out by the participants before receiving their certificate. Conducted courses generate statistics, which is preserved by the market area. However, if the course was organized through LEARN, all valuable data is collected and stored, allowing the generation of reports. The last activity before ending the technical training process, is creating an invoice for the customer.

4.4.1 LEARN Application to Support Technical Training

There are a few ways that LEARN supports the technical training process which can be seen from the process model (Figure 6) by the green boxes or a red box if another system supports the process (and in some cases a green/red box). These boxes symbolize the activities in which LEARN supports the technical training process.

![Figure 6: LEARN Application: Technical Training Process (created by the authors).](image-url)

The green/red boxes imply that LEARN supports this activity of the process, yet, other systems are being used alongside LEARN or are used instead of LEARN. However, this suggests that the technical training process can be conducted using a variety of systems as
One exemplification of this is Google Suite, which offers similar functionalities for storing and sharing material. All actors within this process widely use Google solutions. In some ways, LEARN does not support parts of the technical system. Manager 4 states, “Nothing at all. It is only the old system that supports me with that.”, in regards to LEARN supporting specific activities. Hence, LEARN support for activities within the technical training process depends on the user’s professional role and responsibilities. Those with an administrative role find LEARN to support fewer activities, as represented by Manager 4. While those who conduct training, alike Trainer 3 who had another opinion regarding LEARN supporting technical training. Trainer 3 stated that “LEARN has made it a lot easier to organize everything.”. Trainer 3 and Trainer 4 who perform training operations, use LEARN for most of the activities. Thus, their technical training process is uniformed and structured.

Further, interviewees with similar roles still carry out their processes differently; there is no uniformed or organized way of conducting the process. To this, Manager 4 stated, “[...] so everyone works independently anyways. Every market area, but it’s also different ways of working. It’s not easy to tell the whole world to do this.”. The individuals independently and uniquely perform the process. Trainer 2 said, “[...] no training process is the same every time, they are unique, and we do them differently, [...]”. The interviewee further explained how trainers conduct their training flexibly to conform to the customer’s needs. Trainer 1 and Trainer 2 both explicitly mentioned that they work differently, not according to a structured process.

4.4.2 Impact on The Technical Training Process

With the understanding of what kind of support LEARN gives the users and how the process looks. The following step is to present how LEARN has impacted the technical training process. Consequently, the respondents described how the technical training process changed by adopting LEARN. One considerable aspect, the interviewees mentioned is the possibility to access training material efficiently. All of the participants stated that all the material is placed in LEARN, which makes it accessible for everyone around the world. This reduced the risk of insufficient internet connection limiting access. Which sometimes could be a problem in some locations where technical training is conducted. Regarding the material availability, Manager 1 stated that;

“Trainers can download material whenever, and I have experienced this so many times when a trainer can mail me at night, and I could be on a trip, and I have a bad connection, and they want me to send them material, and that is a huge problem.” (Manager 1 2020)

This has an impact on all the people participating in this study, meaning that the material does not have to be sent manually via email, and the newest version is always available. Regarding where to find the material for training, Trainer 2 stated “Accessibility, not too hard to find when you have decided what kind of training to conduct.”. Since the actors within the technical training process are introduced to a new digitized way of working. It also meant that some parts of the process would be conducted in a different way than it was
An online calendar is now available to get overviews or modules for different kinds of E-learning. E-learning allows technicians or others to train in their own time. Regarding the changes related to the new system, Trainer 4 believes that “It is a little easier, but we had a similar process and structure before using google.”. According to Trainer 3 and Trainer 4 the technical training process has not significantly changed because before implementing LEARN, the process was already digitized locally. Based on the previous information about the digitalization of the process, Trainer 4 stated:

“*Our work system consisted of an excel spreadsheet, and we used google forms to send out invitations to engineers. So we basically got a new system that has the same function.*” (Trainer 4 2020)

One other major thing for the technical training process that LEARN will have an impact on, is the possibility to collect data and make statistics of these to show or track what kind of training has been conducted or is needed. Today, Manager 4 has to follow this process:

“[..] *It would be easier to get the statistics. Because that is something, they request quite frequently from all around the world. Alternatively, they want statistics for the whole world. Now I have to send a request for the statistics. Our own, we know, but not for the rest. And it is not a lot of them who send in the statistics.*” (Manager 4 2020)

With the LEARN system, all the statistics would be accessible and easier to find, with the data collected from the sessions/trainings held in the system.

### 4.4.3 Actual Utilization of LEARN

All of the interviewees for this thesis are aware of LEARN, but yet the topic of actual usage has not been touched. There is a split among the interviewees if they use LEARN or not. There is a split among the respondents, if they use the system regularly or not. Those of the respondents who use the system regularly use it to administrate sessions, uploads material or invites different peoples to a training session. Definition of regularly in this case if whether or not LEARN is a part of the normal process of handling the technical training process, all of the interviewees have used the system in one way or another. As presented in the following Table 3:

**Table 3**: Table of Actual Utilization of LEARN.

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Uses LEARN regularly</th>
<th>Uses LEARN for</th>
<th>Comment on LEARN usage</th>
</tr>
</thead>
</table>
| Trainer 1   | No                   | • Upload material  
• Creating sessions  | “There hasn’t been much work done with it and not much time spent in the system by myself.” |

37 (72)
<table>
<thead>
<tr>
<th>Role</th>
<th>Experience</th>
<th>Uses Offered</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trainer 2</td>
<td>No</td>
<td>Finds material, Uploads material, Finds material</td>
<td>“I haven't used it that much.”</td>
</tr>
<tr>
<td>Manager 4</td>
<td>No</td>
<td>Add sessions, Add events</td>
<td>“What I usually do is to add sessions in the new LEARN.”</td>
</tr>
<tr>
<td>Manager 1</td>
<td>No</td>
<td>Finds material</td>
<td>“We use LEARN a little bit.”</td>
</tr>
<tr>
<td>Trainer 3</td>
<td>Yes</td>
<td>Finds material, Books sessions, Sends invites, Planning/organization</td>
<td>“I still think that we are scratching the surface of what is possible, we try to do our best, I'm still trying to figure out how to do things, but we always to learn new ways of using in it, we think it is a really good platform, we want to develop it and make it a success.”</td>
</tr>
<tr>
<td>Manager 2</td>
<td>Yes</td>
<td>Training follow-up, Statistics for the different trainings, Statistics related to strategic follow-ups and planning for new material</td>
<td>“Now we have one place and everyone knows that it is updated by us, in real time, and everyone is able to access the system no matter where you are in the world.”</td>
</tr>
<tr>
<td>Trainer 4</td>
<td>Yes</td>
<td>Finds material, Planning/organization, Sends invites, Books sessions</td>
<td>“We just decided to draw a line in the sand and started to use the learn system.”</td>
</tr>
<tr>
<td>Manager 3</td>
<td>Yes</td>
<td>Planning/organization, Collects statistics</td>
<td>“When we started looking into and working with the system we saw great potential.”</td>
</tr>
</tbody>
</table>
4.5 Perceived Factors when Adopting LEARN
Within this chapter, the interviewees’ subjective perspectives, perceptions, and experiences will be described. During the data gathering process, the interviewees were allowed to provide their outlook regarding the LEARN adoption, which resulted in rather abstract, but valuable information. Thus, this information is presented to display the individual impressions to be analyzed in Chapter 5. Analysis.

4.5.1 Initial Reactions
The interviewees were asked to describe their initial impressions of LEARN briefly. The majority of the respondents expressed their concerns with the systems’ overall appearance, referring to the user-interface, describing it as outdated and old. In addition to that, they further recognized LEARN for being intimidating, complex, and complicated. Likewise, Manager 2 which is responsible for LEARN shared that notion. LEARN was portrayed by Trainer 4 as “Far too complicated.” concerning some users who belong to “the older generation”, specifically referring to characteristics that technical trainers typically possess. Nevertheless, since these were bare assumptions based on first glance, those who use the system added that the system is complicated with a relatively steep learning curve, but after learning how to navigate, that creases to be a factor.

Trainer 2 mentioned previous experiences with a similar system, which affected the initial reaction to the LEARN adoption for technical training. On that same note, Manager 4 stated that there is a prior system that is required to support tasks that LEARN does not yet cover. The following statement, “For our sake, it was double work.”, conveys the current situation, where the Manager 4 is obligated to interact with two parallel systems alongside each other. This evidently influences that particular user’s assumptions toward LEARN. Although LEARN was generally perceived as seemingly uninviting, those initial reactions were contrasted by some promise of potential and favor as some of the interviewees continued using the system. Manager 3 disclosed that LEARN at the starting point was “An empty shell” without any content, though supposing that it is “a good platform”.

4.5.2 Perceived System Functionalities
The interviewees were invited to elaborate on the functionalities which LEARN provides. They described the features that were familiar to them or functions perceived based on information provided by the organization. The Table 4 summarizes the system functionalities that were recognized by the interviewees.

Table 4: Table of Perceived Functionalities.

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Perceived Functionalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trainer 1</td>
<td>• Booking training Sessions</td>
</tr>
<tr>
<td>Role</td>
<td>Responsibilities</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Trainer 2</td>
<td>- Share and disseminate training material</td>
</tr>
<tr>
<td>Manager 4</td>
<td>- Generate Training Statistics</td>
</tr>
<tr>
<td></td>
<td>- Identifying and mapping competencies</td>
</tr>
<tr>
<td></td>
<td>- Tracking progress (Competence)</td>
</tr>
<tr>
<td></td>
<td>- Developing and sharing knowledge</td>
</tr>
<tr>
<td></td>
<td>- Knowledge Database (a bank of knowledge)</td>
</tr>
<tr>
<td>Manager 1</td>
<td>- Generate Training Statistics</td>
</tr>
<tr>
<td></td>
<td>- Training Calendar</td>
</tr>
<tr>
<td></td>
<td>- Share and disseminate training material</td>
</tr>
<tr>
<td></td>
<td>- Performance indication</td>
</tr>
<tr>
<td></td>
<td>- Identifying and mapping competencies</td>
</tr>
<tr>
<td></td>
<td>- Developing and sharing knowledge</td>
</tr>
<tr>
<td>Trainer 3</td>
<td>- Planning, structuring and organizing training (Sessions and Events)</td>
</tr>
<tr>
<td></td>
<td>- Training Calendar</td>
</tr>
<tr>
<td></td>
<td>- Share and disseminate training material</td>
</tr>
<tr>
<td></td>
<td>- Knowledge Database</td>
</tr>
<tr>
<td></td>
<td>- Online Training Solutions (E-Learning)</td>
</tr>
</tbody>
</table>
Manager 2
- As the main developer and responsible, this person has full knowledge of all system functionalities.

<table>
<thead>
<tr>
<th>Trainer 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Planning, structuring and organizing training (Sessions and Events)</td>
</tr>
<tr>
<td>- Training Calendar</td>
</tr>
<tr>
<td>- Share and disseminate training material</td>
</tr>
<tr>
<td>- Knowledge Database</td>
</tr>
<tr>
<td>- Online Training Solutions (E-Learning)</td>
</tr>
</tbody>
</table>

Manager 3
- Planning, structuring and organizing training (Sessions and Events)
- Generate Training Statistics
- Identifying and mapping competencies
- Tracking training progress (Competence)
- Developing and sharing knowledge
- Online Training Solutions (E-Learning)

The interviewees had similar perceptions about what features LEARN include. Trainer 1, Trainer 3 and Trainer 4 are comparable as they perceive a predominantly identical array of functions. However, Trainer 2 perceives only one single function, to this Trainer 2 stated, “I haven’t used it that much”.

Secondly, Manager 1, Manager 2, Manager 3 and Manager 4 are providing a managerial perspective of the LEARN features. Generally, they perceive and understand functions that support managerial activities, and these specific functions are used for strategic and tactical purposes. Manager 1 highlights the strategic functionalities such as performance indication and the generation of statistical data used for measuring department achievements, which are to be presented for top-management. Moreover, Manager 1 leaves out, mentioning any operational functions regarding organizing, structuring, and planning training. Furthermore, even though Trainer 3 perceives most functions, Trainer 3 clarified that LEARN is likely to offer unexplored features, by saying “I still think that we are scratching the surface of what is possible.”

4.5.3 Perceived Barriers and Obstacles
During the eight conducted interview sessions, the participants gave their impressions regarding problems, barriers, and obstacles that affected their adoption of LEARN for technical training. The particular expressions presented in this section primarily relate to
LEARN itself, system design but also the content and functions. Additional barriers are identified in the Chapters 4.5.5 Perceived User Support and 4.5.6 Leadership and Management support.

4.5.3.1 System Design
As previously mentioned in Chapter 4.5.1 Initial Reactions, all interviewees expressed their concerns with the interaction design and overall appearance of the LEARN platform. These perspectives regarding user experience were further discussed when the interviewees were asked about which barriers or problems they have faced while adopting the system for the technical training process. Most of the Trainees described how the system structure is a persistent factor affecting their utilization of LEARN. Trainer 1 and Trainer 2 bring up difficulties in finding the information that is needed, alluding to the complicated layout and complexity in performing basic tasks through LEARN. Trainer 2 states, “It is quite hard to navigate through the system.”, and further explaining how this has impacted personal usage. Likewise, Trainer 1 supports that perception by saying, “I would use it more if it would be simpler.” suggesting that “It is easy to do the wrong things.”. A substantial part of the other interviewees represents the aforementioned impression. Alike, Manager 4 and Manager 1 acknowledge that LEARN’s UI is commonly perceived as an obstacle in regards to the intended users. Further, both of them, perceive that the system may not have been designed and developed with the users’ capabilities in mind. Manager 2 who supports the users, also recognizes LEARN as “Hard to use for the End-Users”, referring to both administrative users such as trainers and technicians with limited access.

With regards to the system design, Manager 3 suggested that there are flaws from a managerial perspective, stating that “There is no real good way to get a report that shows the whole overview.”, referring to a business overview of technical training. Additionally, this interviewee perceives that LEARN appears lacking in visibility and offers limited report capabilities.

4.5.3.2 Content and Functions
All of the interviewees mention content, the lack of, as a perceived barrier. Content is the data, information, and knowledge that can be accessed within the LEARN platform. All the trainers unanimously recognize the content to be inadequate, deficient in structure and quality. This view is also perpetuated by Manager 2 who perceives the lack of content to impact the LEARN utilization. Manager 2 further explained that continuous use of the system generates content. Hence, it is required to be structured and of higher quality. Moreover, Trainer 3 and Trainer 4 expressed how the content within LEARN has to be developed and uploaded by the users, but initially, at the point of implementing LEARN, it was empty.

In addition to the content perceived as a barrier, some of the respondents pointed out that LEARN does not support a few particular aspects of the technical training process. Trainer 2 conveyed that, “The courses that I conduct do not exist, they are not uploaded in the system yet since I conduct mostly specialized courses.”. Hence, Trainer 2 believes that LEARN claims no benefit for the time being. Manager 4 explained another barrier with
LEARN that has the ability to automatically generate certificates after a conducted training, on the other hand, operator certificates, as well as several customer training certificates, cannot be generated. Manager 4 explained that another system is used to create certificates for specific customers. Concerning this, Manager 3 and Manager 2 mentioned that the case company implements information systems and digital tools; thus, occasionally overlooks how they harmonize and integrate with other systems. Manager 3 commented upon this, stating that LEARN, if integrated with other systems, would inherit valuable information.

4.5.4 Perceived Benefits and Potential
The majority of the interviewees also presented their perspectives on what kind of benefits LEARN provide, as well as potential benefits for those who use the system less. These perceived benefits are contextual findings related to the technical training process or in some circumstances the personal benefit.

4.5.4.1 Training Material and Information Dissemination
All eight interviewees mentioned the systems’ ability to disseminate training material, and this is perceived to be a clear benefit for everyone involved in the technical training process. According to the interviewees, having a platform that provides updated training material to all trainers is also perceived to increase training quality, while saving time. Before LEARN was implemented, training material had to be requested and then sent via email, Trainer 1 states, “Now they can just go straight into LEARN”. On the same subject, Trainer 2 described the same benefit, “Now, new material is being uploaded continuously in the material database”, also suggesting that it is beneficial to save time not having to locate the material. Moreover, Manager 1 described how LEARN is beneficial in order to share training material:

“[...] LEARN is very good because it collects all the training material in one place, it makes it easier for us and for the user around the world. [...] in LEARN, Manuals, Supplier Material, and Training material are directly linked, which saves a lot of time. It also allows us to assure that trainers get the right information, so they don’t train technicians with old material.” (Manager 1 2020)

In addition, Manager 2 further explained that LEARN has contributed to solving a problem with how trainers typically conducted technical training with outdated information, or with the lack of new information. However, the problem has been largely eliminated with LEARN adoption:

“[...] LEARN solves this problem, now we have one place and everyone knows that it is updated, in real time, and everyone is able to access the system no matter where you are in the world. So, that is the biggest advantage.” (Manager 2 2020)

Nevertheless, an amount of trainers still ask the training department for training material and manuals, “There are not many trainers who know where to find the information in LEARN.”, as
highlighted by Trainer 1. Trainer 1 explained how the supposed users of LEARN do not yet comprehend how to access the system, or how to use it properly.

4.5.4.2 Strategic Benefit
LEARN also offers strategic benefits which supports the managers within the technical training process. All the managers that were interviewed perceived that the systems strategic purposes are aligned with organizational strategy regarding training and competence development. Accordingly, Manager 3 declared that LEARN supports regional and global management to track knowledge and competence targets, providing decision making support regarding how to allocate resources. Keeping track of competences allows identification of what kinds of training needs to be conducted in order to efficiently develop competencies. Another strategic benefit is how the training department can utilize the statistical data that LEARN gathers. Manager 1 described this benefit when explaining how LEARN supports management:

“In the end of the year when we have to compile all the results, then it helps a lot, and it will also help during the year when we have meetings with the market areas, to push them, because we can see exactly how much training they have conducted, and which training.” (Manager 1 2020)

Furthermore, the data that LEARN compiles is presented for top-management for strategy follow-ups and performance reviews.

4.5.4.3 Technical Training Efficiency
LEARN is also perceived to increase training efficiency by providing planning and organizing elements (Manager 2 2020; Manager 3 2020; Trainer 3 2020; Trainer 4 2020). Trainer 3 and Trainer 4 mentioned that adopting LEARN has reduced the time spent inviting and assigning participants to technical training, since it is executed autonomously. Hence, LEARN creates visibility over what training opportunities are available for the technicians, allowing them to request training (Trainer 4 2020). All the respondents think that the adoption of LEARN can provide different new opportunities, allowing development and expansion for the training proposition. LEARN does not only allow trainers to save time, the need for knowledge can be satisfied by providing digital training solutions, making new knowledge available by making it accessible on the users own terms (Manager 2 2020; Trainer 3 2020; Trainer 4 2020).

4.5.5 Perceived User Support
The interviewees were asked if they get the support that they need to be able to use LEARN. Everyone perceived that they know who to contact in order to get help when needed, the trainers feel like they have been provided enough help setting up the system to carry out the training process. Trainer 3 and Trainer 4 perceive that they have received adequate training and other kinds of support, further expressing that they had close contact with the system responsible early on during implementation. Manager 2 confirmed that a substantial amount of resources has been invested into supporting the users. On the other hand, Trainer 1,
Trainer 2 and Manager 4 identify a need for additional training and instructions on how to use LEARN. In addition, Trainer 1 stated, “I think that local trainers have a harder time getting help”, to this the respondent mentions that responsible trainers have been contacting Trainer 1 for help with LEARN.

4.5.6 Leadership and Management Support
All eight interviewees have different perspectives regarding top-management involvement. More specifically, four interviewees perceive that the commitment from top-management is inadequate.

According to Trainer 1, top-management is not supportive enough in the usage of LEARN. For instance, trainers have been provided with three training sessions, which however, only one was conducted. There is the perception of top-management being absent, without showing the importance of adopting LEARN for technical training, nor providing constantly relevant information and directions (Trainer 1 2020). Trainer 2 believes that there is a lack of involvement from top-management and high up executives. It is thought that going back to the “structure documents that explain what the system is used for and where functions can be found” would improve the current situation (Trainer 2 2020). Further, Manager 4 argued that there is support only from the direct manager, but not from the top-management. This makes it hard for trainers to get proper training and knowledge about the system. Hence, there is the necessity to focus and invest in time for delivering significant directions on how to work with LEARN and its value, in order to also motivate the users to adopt the system (Manager 4 2020). In addition to the three previous perspectives, Manager 1 gave a managerial view on the lack of the top-management involvement. It is not involved in providing strategic directions for LEARN utilization. Though, Manager 1 acknowledged that there is no direct communication with top-management and the holding company. It is added that there has been no urgency with using the system. It has been implemented but follow-ups have not been conducted (Manager 1 2020). Moreover, it is believed that trainers need to be motivated, committed and trained, in order to successfully adopt the system (Manager 1 2020).

On the other hand, for the four remaining interviewees, top-management involvement was recognized to be adequate during LEARN adoption. Trainer 3 and Trainer 4 discussed that top-management allocated time that needs to be invested in learning how to use the system for the technical training process. Manager 2 who has been responsible for implementing the system for the training organization, believes that once the system was deployed “[...] top-management was incredibly excited, and they have given us interest and involvement.”. Finally, Manager 3 thinks that top-management has been supportive by providing clear strategic directions and the time needed to achieve the strategic goals.
5 Analysis

This chapter of the thesis will present the analysis of the empirical findings through interpretations in order to analyze and understand the patterns found within the context of the technical training process, LEARN, and users. Further, it will show the identified factors affecting the LEARN adoption and use for the technical training process. This chapter will be themed according to the empirical data in Chapter 4. Empirical Findings, hence, the analysis in its entirety, is based on the interviewees’ subjective perceptions.

5.1 Management Involvement

In this case, regarding LEARN, there is a differentiation between two groups. Those who perceived adequate top management support and those who perceived inadequate support. The group of interviewees who were satisfied with the managerial involvement had the same top-management and direct manager. Their direct manager (Manager 3 2020) described how top-management had been enthusiastic about LEARN implementation as a strategic directive. Manager 3 efficiently cascaded the strategy to the local UK technical trainers (Trainer 3 2020; Trainer 4 2020). These trainers reflected upon how the top-level and local leadership had a crucial role in their LEARN adoption, giving them the resources, time, and support needed to succeed. The clear roles and directives for the UK respondents (Manager 3 2020; Trainer 3 2020; Trainer 4 2020) were prominent, an aspect that was transparent in their perceptions and experiences. They also describe that they had been sufficiently informed regarding LEARN, its benefit, and how it should be used.

The other collection of the interviewees (Manager 1 2020; Manager 3 2020; Trainer 1 2020; Trainer 2 2020), who were located in Sweden as a part of the central organization, perceived the top-management involvement differently. The top management has, in this case, influenced the LEARN adoption, presumably without realizing it. Hence, it is likely that the perceived absence of top-management engagement was a factor affecting the utilization of LEARN. These respondents experienced the varying characteristics of management and unclear strategic directions, combined with no obligation to use LEARN. Also, this could be the reasoning of why the system is used less than envisioned. As nuanced by Manager 1, inadequate directives and commitment from top-management had a considerable effect on LEARN’s usage rate. Without top-management’s involvement, there is no substantial authority to make sure that organizational strategies are obeyed. Hence, utilization of systems’ and encouragement of executing system-related activities will be affected, since top management provides ineffectual or inadequate guidance. However, those who perceived inadequate top-managerial support did discuss that their direct manager had been involved, providing training, time, and support. However, these efforts did not increase the usage of LEARN for the technical training process. Additionally, the group who did not use LEARN regularly mentioned a shortage of information regarding how to use the system, its benefits, and expectations. Thus, top-management and local management impact KMS utilization and affect the employees’ perceptions of the system.
5.2 Organizational Culture and Structure

The empirical findings attest that contextual distinctions are separating two groups: the respondents in the market area (Manager 3 2020; Trainer 3 2020; Trainer 4 2020) and those from the central organization (Manager 1 2020; Manager 2 2020; Manager 4 2020; Trainer 1 2020; Trainer 2 2020). They have contrasting leadership, culture, structure, responsibilities, organizational placement, and distinctive goals. As explained previously in this research, the contextual findings were collected from a global organization. The interviewees are stationed in different countries, organizational structures, and organizational cultures. The gathered material suggests that there are distinctions to consider based on the differences, as mentioned earlier. However, organizational culture, structure, and size appear to have implications on the interviewees’ perceptions and experiences, in this case, the organizational culture and structure is a product of organizational complexity.

The case company is a global company with over 5000 employees, which conveys an intricate context, which complicates KMS adoption. Hence, each unique business unit conceives its subculture, with its values, objectives, goals, and arrangements. On the other hand, the company, regardless of geographic placement and values knowledge sharing. LEARN and KMS perfectly align with the organizational norms. Conceivably, this might be a characteristic of the organizational culture incorporating the market areas to converge in knowledge sharing processes across the borders.

5.3 Employee Commitment

LEARN was deployed at the same time as other systems were introduced to the organization. Manager 2 described circumstances to implement a new KMS to be unfavorable; the employees did not particularly request another system. Commonly, employees have adverse reactions to new technology because they already use an array of software for different tasks. For the people involved in the technical training process, multiple systems are utilized (as presented in Chapter 4.3.1), creating barriers between the users and a new system. Thus, adopting a new system within their process forces changes in behavior. There is a difference between the trainers in relation to commitment to the system, and therefore also the usage of the system. Trainer 3 and Trainer 4 decided that no matter what it takes, they will use LEARN to the best of their abilities. This commitment had a visible effect on usage frequency, utilizing LEARN for the majority of the technical training process. While on the other hand, Trainer 1 and Trainer 2 did not make the joint decision to commit to using LEARN, which ultimately ended up affecting the system usage.

The empirical content shows discrepancies in how some trainers have been supported in both adoption and use. Select trainers were subject to significant time investment by the system responsible, early on during implementation. This was explicitly considered by Trainer 3 and Trainer 4 as a factor affecting their use of LEARN. The trainers who received adequate support were also involved early in the implementation process, becoming early-adopters, thus, using the system entirely. All trainers around the world did receive multiple training opportunities; however, the training sessions did not appear to affect utilization. Though time and resources were used to educate the trainers, yet, individuals require more
support and help. Nevertheless, both trainers and managers acknowledge a need for additional training and instructions on how to use LEARN.

Additionally, Trainer 2 described from experience how a similar system was unsuccessful in another organization in the past. Hence, it formed a predetermined perception with Trainer 2 meaning that the LEARN perception was affected. Hence, the discrepancies between all the trainers may be justified by their predisposition to interacting with LEARN. Therefore, existing obstacles perceived by the users affect their devotion to adopting and utilizing LEARN. Furthermore, since the trainers have different kinds of responsibilities concerning the technical training aspects, it is easier for Trainer 3 and Trainer 4 to see a direct association to use LEARN in their practices. In contrast, for Trainer 1 and Trainer 2 their technical training process is offered globally and locally, which requires flexibility. To be able to feel that LEARN is enhancing job performance is a motivator affecting employee commitment. Moreover, it is apparent in this case that the trainers’ different roles affect their way of recognizing the positive outcomes in their job performance when utilizing LEARN.

Moreover, top management has had different approaches in supporting LEARN, and in this case, managerial support seems to affect employee motivation and commitment. Particularly with aligning practices to strategies, focus, and allocating time for the trainers to become proficient, hence, effectively utilizing the system. The commitment from local management is apparent, even though top-management is absent. Nevertheless, since the involvement of top management is missing, employee commitment is affected. There is a feasibility to achieve a commitment throughout the entire technical training process, and with all the LEARN users. However, because of several barriers, equivalent commitment cannot be achieved with all the users.

5.4 Perceived Benefits

All of the interviewees perceived LEARN’s benefits and potentials, which LEARN can provide for them, depending on their involvement and exposure to LEARN. Hence, the number of benefits varies between users. Those who have used LEARN regularly recognized a wider range of benefits. When using LEARN more often, the practical benefits get more apparent, which is proven by all of the participants. The users who fully utilize LEARN perceived more practical benefits than those who use it less. Moreover, this relates to LEARNs complexity, which makes the perception of the functions challenging to comprehend; this is analyzed further in Chapter 5.5 System Complexity. Within this study, the benefits for the decision-makers and management are well-defined. Hence, Manager 1 and Manager 3 understand both the potential benefits for managerial processes and the practical benefits for the employees.

The majority of the interviewees perceived LEARN to provide different functionalities (shown in Table 4) and, if used, a variety of benefits. However, all of the interviewees believe that the design is difficult to understand and that the content accessible on LEARN is not adequate. Further, it has been discussed the lack of crucial functionalities, such as integration with other systems within the company as well as the generation of customer
certifications. LEARN may not include information about customers, so the employees have to get access to another system. However, Trainer 2 perceived it being too difficult and did not adopt it at all. Hence, it is believed that the utilization of the LEARN system is not beneficial for some users.

5.5 System Complexity
LEARN is perceived to be a very complex system and hard to understand, as stated by Manager 2 “Hard to use for the End-Users”, which is supported by all of those who participated in this study. Mainly it is the system design of LEARN that is causing the issues related to complexity. Multiple interviewees stated that they experience difficulties understanding how to carry out basic actions such as adding an event and have to navigate through the system to find the right information or function. As trainer 1 stated, “It is easy to do the wrong things.”, which further strengthens the argument that the design of the system burdens the complexity of the system, ultimately creating a barrier for the users. Furthermore, in this circumstance, it is plausible that LEARN holds high complexity and is challenging to comprehend while learning the system. Apart from LEARN being complex, the design of the system is not perceived as an encouraging determinant for using the system. As Trainer 1 stated, “it looks like a system from the 80’s”, which relates to the interaction interface of the system, seemingly the design features create additional complications.

However, what is apparent in this situation is that all of the interviewees had an initial reaction, thinking the system looks exceedingly complex, difficult to understand, and intimidating. Thus, implying that LEARN may not have had a favorable start from a user perspective. The design and the functionalities of the system were designed in such a way that it was perceived by the users to be complex, not an interface they particularly approved, and a feeling of a new addition to their process. When considering the current rate of usage, it might insinuate that there is a division between the interviewees, dividing those who use LEARN and those who do not engage in regular use. Moreover, this could co-relate to the perceived complexity of the system. Alternatively, rather transpire to relate to the compatibility and conformity of LEARN, which have been analyzed further in Chapter 5.6 Compatibility and Conformity.

5.6 Compatibility and Conformity
As shown in LEARN Application: Technical Training Process (Figure 6), multiple systems are supporting the users within their technical training process, amongst them is LEARN. LEARN comprises varied means to simplify the technical training process, proposing the potentiality of having a streamlined process within the whole global training organization. Nevertheless, the characteristics of LEARN may insinuate that conformity is a deficiency, rather than compatibility. The users have distinct systems supporting their technical training process, meaning when LEARN is added to the process, their work process is required to convert. This argument is strengthened by the system being implemented for around a year, but the usage is still relatively low. This is a cause of the system not being specifically focused on the technical training process, which is only a small part of the system. This
means that LEARN is applicable to the technical training process, but the overall compatibility and conformity could be defined as low. Since the system is technically not fitted for the process, it is not supported at the moment. Since LEARN is not developed with the technical training process in mind, this means lower compatibility.

Henceforth, two main user groups were identified, those who utilize LEARN to conduct the technical training process (Trainer 3 & Trainer 4) and those who do not (Trainer 1 & Trainer 2). The apparent difference between the trainers is that Trainer 3 and Trainer 4 already practiced an essentially digitized process with integrated solutions for automated actions. However, in the case of Trainer 1 and Trainer 2, LEARN was an entirely different approach to manage the technical training process. Between those two groups, it is plausible to distinguish how the compatibility and conformity for the KMS is perceived for various users.
6 Discussion

This chapter will first compare and discuss the analysis of the thesis, together with the theoretical framework and theories (Chapter 2. Theory), in order to find similarities as well as differences. An upgraded conceptual framework will also be displayed and explained. Further, reflections about the methods that have been adopted to carry out this study will be presented. Explaining also what could have been done differently and what kind of impact those changes would have on the empirical findings.

6.1 Results Discussion

Previous research claims that top management has the ambition to implement a KMS to increase the knowledge, learning, and expertise in the organization (He et al. 2009; Kuo & Lee 2011; Sher & Lee 2004; Wang & Wang 2016). The studied company shares this aspect with previous research. There is a comparable ambition to strategically use knowledge resources and developing competencies to obtain a competitive advantage on the market, as the purpose to implement a KMS. Since the case company is a global organization, this falls in line with why other organizations have adopted these systems (Cham et al. 2016; Gressgård 2015; He et al. 2009; Wang & Wang 2016).

As an organization, it is essential to keep in mind that KMSs are inherently complex; thus, it is common to experience issues when adopting and using these systems (He et al. 2009; Karlinsky-Shichor & Zviran 2016). Hence, conducting this research addresses that the case company has experienced some concerns with their adoption and utilization of a KMS. The issues perceived and experienced in this particular case were closely related to previous studies’ KMS success factors. All of the factors featured in this research were found to impact the KMS adoption for the technical training process. For KMS there are unique factors that need to be kept in mind when adopting a KMS, for KMS to reach its value-adding potential to the company (Cham et al. 2016; He et al. 2009). In this case study, it is arguable that these success factors have not been taken into consideration before and during adoption, which means that some of the success and value to the case company has been missed. Moreover, this type of system is distinctive, setting it apart from other systems since it is perceived to be more voluntary to use (Akhavan et al. 2006; Cham et al. 2016; Gressgård 2015).

This has also been shown to affect the case company since the usage varies from market area to market area, and also within the central organization. This research also supports that an LMS can be used and treated as a KMS. This supports the research by Ritchie et al. (2011), who suggested that the industry application of LMS is more created like a KMS for this type of company. This LMS has been adopted to support the same things as a KMS usually, and as Maier (2007) suggested in the research that LMS is a function included in the KMS. Also, for this case, the LMS is integrated within the company’s KMS, thus supporting the previous research with similarities with an LMS and KMS.
6.1.1 Success Factors Discussion
As an organization, it is essential to keep in mind that KMSs are inherently complex; thus, it is common to experience issues when adopting and using these systems (He et al. 2009; Karlinsky-Shichor & Zviran 2016). This type of system is distinctive, setting it apart from other systems since it is perceived to be more voluntary to use (Akhavan et al. 2006; Cham et al. 2016; Gressgård 2015). Furthermore, conducting this research addresses that the case company has experienced some concerns with their adoption and utilization of a KMS. The issues perceived and experienced in this particular case were closely related to previous studies' KMS success factors. All of the factors featured in this research were found to impact the KMS adoption for the technical training process.

Researchers consider top-management and leadership involvement to be a critical factor of determining KMS success (Hung et al. 2005; Gressgård 2015; Okour et al. 2019; Rezvani et al. 2017; Wang & Lai 2014; Wang & Wang 2016). This particular study found managerial support and presence as a central factor affecting both the organizational context and LEARN usage. Leadership involvement seemingly influenced the employees’ motivation towards using the LEARN, even though the system complexity and contents were perceived as a considerable obstacle. Those who utilized LEARN for the technical training process were supported, encouraged, and given the resources needed to succeed. Wang and Wang (2016) emphasize that adequate management commitment provides support for the employees to sustain system-related processes and activities. Hence, top-management needs to be present in KMS adoption, helping to decrease resistance from the users by communicating the system's usefulness and organizational benefits (Rezvani et al. 2017; Wang & Wang 2016).

However, presenting information regarding the benefits of KMS is proven to be insufficient; strategic directives need to be transparent in order for the employees to apply the system for their processes. Local leadership has a vital role in facilitating system use by providing time, interest, training, and aligning systems with strategic goals. Thus, managerial support motivates employees to contribute to organizational performance by using the KMS to increase the efficiency of daily operations and processes (Dulipovici & Robey 2012). Moreover, inadequate top-managerial involvement does affect the adoption and use of these systems, the users who did not use LEARN mentioned that urgency and strategic direction affected their adoption. Top-leadership impacts the employees and their intentions and motive to utilize the KMS (Arntzen & Ndlela 2007; Chong et al. 2010; Gressgård 2015; Wang & Lai 2014).

Furthermore, previous research mentioned the effects of organizational culture, structure, and environment on KMS adoption (Akhavan et al. 2006; He et al. 2009; Hung et al. 2005). Implementing information systems, and especially systems for KM, has been known to be dependent on the organizational capabilities to change and adapt (Akhavan et al. 2006; He et al. 2009; Hung et al. 2005). Hence, the cultural and structural characteristics need to facilitate KMS adoption; these factors appear to be prevalent in LEARN's case. It has been analyzed that individuals within a particular context were affected by its culture and
structural aspects. The size of the case company was the main organizational feature, ultimately determining how the users would perceive the KMS. This was also identified in other studies (Gressgård 2015; He et al. 2009; Hung et al. 2005), as larger companies place departments in different markets, creating autonomously run organizational units. Thus, explaining how LEARN adoption had different outcomes based on the respondents' organizational inherency, even though the overall organizational culture valued knowledge transfer and sharing processes. These are some of the cultural requirements that research suggests being appropriate for KMS adoption (Wang & Wang 2016). Hence, the organizational complexity affected the utilization of LEARN for some of the interviewees.

For this specific case study, the employees’ commitment and motivation were affected by a variety of aspects. However, some of them were not mentioned in previous research. Through the participants' perceptions of KMS adoption, it was possible to identify that the circumstances in which LEARN was introduced were unfavorable, as they have received many other systems to use simultaneously. Adding a new system to support daily tasks did not motivate the users. Hence, managerial support needed to be strong in order to combat this. Both the culture and leadership have to facilitate employee empowerment and motivation for the KMS to be utilized (Akhavan et al. 2006; Hung et al. 2005; Wang & Wang 2016). The employees need to be provided with the right amount of assistance, training, and instructions on how the system should be used within the processes (Arntzen & Ndlela 2007; Gressgård 2015; He et al. 2009; Hung et al. 2005). This was found to be an essential factor affecting the users, as the participants who experience adequate training and support utilized the system regularly. The empirical evidence also showed how involving the users in the adoption of early-created commitment, which is also supported by Hung et al. (2005), who stated that early employee participation is essential. Henceforth, the users who perceived LEARN as beneficial and useful to enhance job performance were motivated to utilize the system for its intended purposes. This relates to Gressgård (2015), who suggests that employees are more committed to using the KMS based on personal growth and other intrinsic motivators.

Organizations adopt KMS into their processes since they have the potential to be beneficial for the organization and the employees; however, these benefits have to be perceived and understood by the employees (Dulipovici & Robey 2012; Wang & Wang 2016). This thesis did show that the employees perceived and recognized a wide range of benefits according to the given information. The employees who had adopted LEARN into the technical training process perceived its practical benefits. Practical benefits provide direct value to the employee’s work, thus, affecting the utilization. According to previous knowledge, this is described as a determining factor for KMS success (Dulipovici & Robey 2012; Ritchie et al. 2011; Wang & Wang 2016). On the other hand, the respondents who did not use the KMS frequently could only perceive the potential benefits, suggesting that there is a distinction between potential benefits and practical benefits (Dulipovici & Robey 2012; Karlinsky-Shichor & Zviran 2016). Moreover, LEARNs complexity withheld some respondents from experiencing the practical benefits.
Existing research has defined system complexity as “The degree to which an innovation is perceived as relatively difficult to understand and use.” (Rogers 1983; Zhu et al. 2006 both cited in Wang & Wang 2016, p.831). Hence, the complexity of LEARN was deemed high since the users perceived it to be; hard to use, difficult to understand, and intimidating. Everyone participating in the case study experienced difficulties and issues as a result of the system’s complexity. Subsequently, this affected the system utilization, as suggested by other researchers (Ritchie et al. 2011; Wang & Wang 2016). The system design and interactive interface were challenging for the users. Hence, they were not encouraged by its appearance. Hence, they claimed that the design made using LEARN troublesome, which created a steeper learning curve, hindering some of the intended users from adopting LEARN. Therefore, systems need to be developed with an appropriate level of complexity, appealing to the employees (Wang & Wang 2016)

LEARN was identified as one of many systems used to facilitate the technical training process; it provides various tools for making the process more efficient. However, the contextual findings suggested that LEARN lacked compatibility and conformity to the technical training process. It was not developed to conform to existing processes; the individuals had to adapt and adjust to LEARN. This was found to affect the utilization of LEARN. Similarly, researchers mention that KMS’ are required to be compatible with current practices to reduce the learning process for the user, which in turn awards usage of a KMS (Kuo & Lee 2011; Wang & Wang 2016). If the KMS is incompatible with processes, it requires employees to conform to the system, implying that those adopting the system are obligated to accommodate entirely new practices (Kuo & Lee 2011). The respondents perceived this phenomenon as LEARN would change their way of working, ultimately affecting their usage of LEARN.

6.1.2 Proposed Conceptual Framework
As suggested by Zammuto et al. (2007), this conceptual framework was developed in order to keep both the organization and system in mind. The aim was to understand the whole picture behind the process of the actual usage of LEARN, with both inputs from the Affordance Theory and the success factors. This made it possible to understand the differences in the perceived affordances of each individual’s view and the impact of success factors in the affordance process presented by Pozzi et al. (2014). Every system offers the same functions; however, the users’ perceptions determine whether the system is beneficial and useful (Markus & Silver 2008), a theory that explains why the users of LEARN perceive different functions as beneficial and useful over others. It is the same for the success factors since they are perceived to be true or not according to the users’ perceptions. Every time the users interact with different objects, the affordance perceived is entirely up to the user (Gibson 1986; Pozzi et al. 2014).

The following conceptual framework (Figure 7) presents where, in Pozzi et al. (2014) model, the success factors come into action.
Figure 7: Updated Conceptual Framework (created by the authors).

The “Affordance Theory” model is considered to be helpful to understand how users perceive and actualize affordances, and at which stage the factors affect each process within the “Affordances Theoretical Framework” of Pozzi et al. (2014). Based on this affordances framework, it was possible to identify relationships between its processes and the success factors displayed in Figure 7 and described in detail in the next four subchapters.

However, the Organizational Culture and Structure success factor was seen as a contextual factor impacting the entire affordances process, where top-management (related to the Management Involvement factor) can influence the organizational culture.

6.1.2.1 Cognition Process
As argued by Pozzi et al. (2014) and by the interviewees, the cognition process consists of an organization and its IT-artifact that continuously affect each other. In this case, ‘organization’ has been intended as a group of individuals carrying out the technical training process. Understandably, there is a direct relationship between these two constructs.

Moreover, it has been observed that there is a distinction between identifying affordances and the actual affordances that IT artifact offers (Pozzi et al. 2014). These affordances, based on the “Affordances Existence” construct, are generated by an organization’s capabilities to comprehend what IT can do and provide (Pozzi et al. 2014). With this, the individuals within the technical training process need to be first informed that LEARN exists and the purpose that it is supposed to fill. Afterward, these individuals are the ones who need to identify the LEARN offerings’ existence. Hence, they need to become aware of the capabilities of this system and what it can deliver to the organization. It is also added that this activity is
supported by top and local management providing strategic directives and allocating time for familiarizing with the artifact. Additionally, encouraging the trainers to become the early adopters of the system.

Hence, the Management Involvement factor is present at this first stage of the entire affordance process, since the top-management influences the cognition process by providing information about the affordances existence and LEARN’s purpose.

6.1.2.2 Recognition Process
Based on the “Affordance Perception” construct, an organization needs to perceive the system’s functionalities to be able to adopt them in a successful manner, which in turn would lead to benefits (Pozzi et al. 2014). Further, a direct relation between Affordance Perception and Affordance Existence has been discovered and studied (Pozzi et al. 2014).

In relation to previous research, LEARN provides different functionalities (shown in Table 4) and a variety of benefits if used. However, this system design is difficult to understand, and the content accessible on LEARN is not adequate. Hence, it is at this stage that LEARN’s users find themselves to deal with the System Complexity factor. Further, it has been discussed the lack of crucial functionalities, such as integration with other systems within the company as well as the generation of customer certifications. It happens that LEARN does not include information about customers, and for this reason, the employees have to get access to another system. Further, The complexity of this system can also be perceived as too difficult that employees do not adopt it at all, believing then that the utilization of the LEARN functionalities may not be beneficial for the organization. Therefore, in the recognition process, employees are affected by both the Perceived Benefits and System Complexity factors before becoming aware of LEARN’s functionalities and functional affordances.

6.1.2.3 Actualization Process (Behavior)
As previously researched, during the Affordance Model’s actualization process, the organization needs to take action (Strong et al. 2014 cited in Pozzi et al. 2014, p.7). This stage consists of the individuals’ strategic intentions and behavior to use the IT artifact (Leonardi 2011; Pozzi et al. 2014). Therefore, employees need to adapt their way of working in relation to LEARN. Further, for them to actualize the affordances, they need to be committed to LEARN. Hence, at this stage, the Employee Commitment factor appears, which is affected by the System Complexity and Compatibility and Conformity factors, as also discussed by all the respondents. When the system is new and complex, there is no interest nor commitment to learning how to use it. Due to its difficulty, it would not be possible to discover its practical benefits; hence the system cannot be actualized.

Leonardi (2013) further discussed the concept of “Shared Actualization”, which consists of individuals within an organization utilizing the same functionalities to attain specific benefits. In this case, however, it emerged that employees can simultaneously use a set of functions continuously, agreeing on shared actualization. On the other hand, some
employees do not use LEARN; hence they spontaneously use single functions with no specific intentions.

6.1.2.4 Affordance Effect
According to Pozzi et al. (2014), Affordances Effect consists of the results that the actual utilization of the system can generate. It was observed that there could be instantaneous effects as well as long term effects. The affordances effects are created by utilization of the system for a certain period of time, systematically achieving organizational goals (Strong et al. 2014, cited in Pozzi et al. 2014, p.8). In this case, multiple effects prompted by the actuation of LEARN affordances were identified. They consist of two main effects, Organizational Effects, and Process Effects. The positive effects on the technical training process were recognized as; training efficiency, training quality, development opportunities, and strategic benefits and value. However, the effects are beneficial for the organization as a whole by achieving goals regarding training, KM, and competence development.

6.2 Method Reflection
In this case, the selected methods were adequate to fulfill this thesis’ purpose, by gathering the different opinions concerning LEARN. Further, this study has focused on being transparent, allowing the study’s recreation by being clear about the way of conducting the research and with validity. This was possible by comparing results with other studies and allowing the interviewees to see if they have been accurately cited. However, certain aspects of methodology could have been conducted differently, which, in turn, could have diverse effects on the results and the research’s generalizability. Due to the chosen purposive sampling, the qualitative research method and single-case study design do affect the overall generalizability to diverse contexts. However, the particular study’s outcome could be used as guidance for both researchers as well as organizations.

Before each interview, the respondents were provided with a brief introduction and informed about the topics that would be covered during the interviews. However, the questions were not sent in advance, which affected some of the gathered data. For example, when it was asked about the number of systems the respondents use daily, they had to think, and there was a difference if the interviewees were counting directly from their desktop or thinking about them. For avoiding this thinking process during the interviews, the questions should have been sent in advance, which, in turn, would have altered the results. Hence, all the respondents' replies consisted of their initial reactions to each question. Nevertheless, sharing some of the questions beforehand could have provided more reliable results, for instance, on the exact number of the systems they adopt. No test group was used for the questions, meaning that a few questions had to be rephrased or changed depending on if the interviewee understood the meaning of the questions or not. Therefore, testing the questionnaire in advance could save time and reduce the interviews’ duration. Further, it could have facilitated the interviewees to focus on the topic rather than discussing the meaning of the questions during the interview.

The selection for this thesis was based on the authors’ previous knowledge about the organization and its choice for who could give the most valuable information. It was then
possible to select different people interacting with LEARN in several ways. Another way to handle the selection and get a broader picture of the entire organization would have to choose people with the same roles for multiple market areas. For instance, sampling various trainers from different market areas and not including any managers present in this study. However, the methodology adopted for this thesis granted the opportunity to understand the different users’ perspectives and a bigger picture than having a homogeneous group of people with similar roles and tasks.
7. Conclusions, Suggestions and Future Research

This final chapter will start presenting the conclusions of the entire thesis, showing also that the purpose and research questions of the thesis have been fulfilled. Concluding the chapter by presenting suggestions for the case company’s continuous work with LEARN. Moreover, recommendations for further research in the KMS areas, in order to contribute to existing literature, will be provided. The purpose of this research is to identify and analyze different factors affecting KMS adoption for the technical training process.

7.1 Conclusions

This executed case study made it possible to identify and describe the most prevalent success factors for KMS adoption. These success factors were; Management Involvement, Organizational Culture and Structure, Employee Commitment, Perceived Benefits, System Complexity, and Compatibility and Conformity. All of the mentioned factors influenced and affected the respondents’ affordances process. Moreover, how the different factors impacted the individuals within the technical training process has been discussed throughout this thesis (Chapter 4. Empirical findings, 5. Analysis, and 6. Result discussion). It was found that the respondents who perceived and experienced adequacies regarding the factors were positively affected, thus, utilizing the system to reach organizational goals. However, some factors were recognized to affect utilization more. The most prevalent result was that the participants who perceived inadequacies in multiple factors underutilized LEARN. The perspective deriving for affordance theory made it possible to understand how the identified factors affect the different stages within the affordances process suggested by Pozzi et al. (2014). Thus, further solidifying that the factors directly affect the individuals' subjective experience and perceptions, while also impacting utilization. In conclusion, a KMS is a complex system to adopt in an organization and processes. The user's perception and the success factors can have a positive or negative effect on the utilization of a KMS. Hence, both the success factors and the Affordances Process need to be acknowledged when adopting a KMS, to understand that the individuals’ perceptions ultimately decide if the system reaches its value-adding potentials.

7.2 Suggestions for The Case Company

These suggestions are based on the empirical findings, previous research, theories, and suggestions from the respondents during the interviews. These suggestions have not been tested out, hence they should be viewed as suggestions of the continuous work with the LEARN system.

Create a Joint Process

There are multiple approaches to managing the technical training process, and as suggested by interviewees. Hence, it could be beneficial to develop a collective process integrated into the LEARN system, standardizing activities. Providing structure documentation for all users could result in trainers utilizing the system functions efficiently, thus, fulfilling its potentials. Furthermore, this could be one way of communicating the value that LEARN brings to the trainers' work and making it easier to inform them regarding the benefits for the individual. Since KMS is a voluntarily used system for most users, LEARN would
benefit from users approaching system-related processes with the support of already determined activities, actions, and procedures. The well-described complexity of LEARN suggests that users would benefit from fixed procedures and processes for best-practice.

Instructions and Guidance
The interviewees requested instructions, documentation, and guidance. Hence, providing them with documents describing how to add sessions or events to LEARN could be worthwhile. This could allow the users to discover how to use the system on their terms. Therefore, it could be an accessible alternative to gain system usage, letting the individual familiarize themselves with the LEARN. However, these manuals or instructions can be followed up by educational opportunities where additional questions and problems can be discussed. In this way, the user will already possess some experience going into real training with the system responsible.

“Key user” Concept and Incentives
Applying a “Key user” concept has been covered in studies as an advantageous method for increasing system utilization. It provides a network of individuals who take pride in helping other users and assuring that the system is used. Further, during the data collection, interviewees mentioned that a similar method is practiced for other systems within the company. Some of the trainers have already acted as some key/super users for different market areas. This would be a way to show how beneficial the system can be and also a part of the train the trainer process. Moreover, previous research has shown other companies’ applied techniques of incentivizing the use in different ways. This does not necessarily include providing extrinsic incentives such as compensation; however, that could be a motivator for some users. Motivating by giving attention to those who invest effort into learning, using, and becoming proficient could be beneficial. This may allow individuals to increase their intrinsic motivation toward personal growth.

Involvement of Top Management
As discussed in this research, the involvement of top management is of significance in regards to system use. Therefore, a suggestion would be to have top management participating in encouraging the utilization of LEARN, explicitly concentrating on the technical training process. Having the presence of top management would bring added attention to LEARN; however, it could motivate the employees as well. Previous research coincides that top-management directions need to be apparent so employees can work according to organizational strategy, in this case, urging employees to utilize digital tools as a part of the company’s strategic direction.

Collaboration and Learning from Each Other
This research highlighted how two different groups of people adopted and used the KMS for technical training. However, some of the respondents utilize the systems more than the others; thus, it gives the opportunity to learn from each other. Those who are proficient users could share their experience with the users who are in the process of getting familiar with LEARN. All technical trainers within the organization could participate in workshops specifically organized to collaborate regarding LEARN. This would not only give the
impression that the KMS is important, it could also increase future collaboration and communication between trainers.

7.3 Suggestions for Further Research
Knowledge exchange systems and KMS have been studied for years; thus, becoming well-known phenomena. However, a substantial amount of the research is centered around specific industry applications, such as education, pharmaceutical, banking, and oil/gas industries. Other varieties of industry applications are not represented to an equal extent. The less technologically advanced sectors have not been featured as much; particularly, the manufacturing industry and heavy industry, which have been left unexplored. Hence, the knowledge regarding KMS adoption and use in well-researched industries could be compared with less researched industries to recognize the differences.

Therefore, future research could focus on identifying how KMSs are applied and utilized across different sectors to understand if the success factors would be different from the ones that have been identified by conducting this research. This kind of further research would also contribute to the current literature by showing if the success factors are different or similar depending on the type of industry, or also size of a company. Additionally, it might be useful to analyze how to prevent certain negative effects that can be generated by some factors. Research investigating KMS adoption within specific processes is somewhat unexplored. Hence, researching the users’ experiences and perceptions within a particular process would be beneficial to enhance knowledge regarding KMS success factors. Furthermore, future research initiatives could adopt similar methods as the ones adopted for this thesis, however, taking into account the cultural aspects varying amid market areas and countries.
References
This part of the thesis will present the references used.

Articles


**Bibliography**


**Interviews**

Manager 1 (2020). *Meeting with the Manager*. Interviewed by Jacob Brandin & Julia Lundgren [Google Hangout video conferencing]


Manager 3 (2020). *Meeting with the Manager*. Interviewed by Jacob Brandin & Julia Lundgren [Google Hangout video conferencing]


Appendices
This part of the thesis will present the appendices that are of interest to understand the work behind this thesis.

Appendix 1. Interview Guide for Trainers (Version 1)

- What is your work title?
- What are your work responsibilities?
- How many systems do you use daily and what do they support you with?
- What were your first thoughts when you heard that LEARN was being introduced? How LEARN was brought to your attention?
- What does your technical training process look like from customer need to conducted training?
- How would/do LEARN support that process? What activity/activities are supported?
- Would/Does LEARN make your process easier/more efficient? How?
- What parts of LEARN do you think are good and which parts do you feel there is room for improvements?
- Who would you say is the target demographic for LEARN?
- Is the usage of LEARN supported? If there are any issues with LEARN is there anywhere/anyone to turn to?
- How does management support usage of LEARN?

Appendix 2. Interview Guide for Trainers (Version 2)

- What is your work title?
- What are your work responsibilities?
- How many systems do you use daily and what do they support you with?
What were your first thoughts when you heard that LEARN was being introduced? How LEARN was brought to your attention?

What does your technical training process look like from customer need to conducted training?

How would/do LEARN support that process? What activity/activities are supported?

Would/Does LEARN make your process easier/more efficient? How?

What parts of LEARN do you think are good and which parts do you feel there is room for improvements? What are some barriers and limitations?

Do you feel like you have a grasp on what kind of functions LEARN offers?

Who would you say is the target demographic/user for LEARN?

Is the usage of LEARN supported? If there are any issues with LEARN is there anywhere/anyone to turn to for support?

How does management support usage of LEARN?

What do you think are the factors for success? What is it that you have been doing to reach success?

What do you think is needed to make sure that this system is used more, from your perspective?

Appendix 3. Interview Guide for Managers (Version 1)

What is your work title?

What are your work responsibilities?

How many systems do you use daily and what do they support you with?

What were your first thoughts when you heard that LEARN was being introduced? How LEARN was brought to your attention?
- What does the technical training process look like from customer need to conducted training?

- How would/do LEARN support that process? What activity/activities are supported?

- Would/Does LEARN make your process easier/more efficient? How?

- What parts of LEARN do you think are good and which parts do you feel there is room for improvements? What are some barriers and limitations?

- Do you feel like you have a grasp on what kind of functions LEARN offers?

- Who would you say is the target demographic/user for LEARN?

- Is the usage of LEARN supported? If there are any issues with LEARN is there anywhere/anyone to turn to for support?

- What kind of support have you experienced from top-management?

- What do you think are the factors for success? What is it that you have been doing to reach success?

- What do you think is needed to make sure that this system is used more, from your perspective?

**Appendix 4. Interview Guide for Managers (Version 2)**

- What is your work title?

- What are your work responsibilities?

- How many systems do you use daily and what do they support you with?

- What were your first thoughts when you heard that LEARN was being introduced? How LEARN was brought to your attention?

- What does the technical training process look like from customer need to conducted training?
- How would you say that LEARN is supporting the technical trainers in their process?
- Would/Does LEARN make the technical training process easier/more efficient? How?
- How would/does LEARN support your work as manager? which activity/activities are supported?
- When introducing LEARN to you, what kind of benefits were talked about in relation to LEARN?
- What parts of LEARN do you think are good and which parts do you feel there is room for improvements? What are some barriers and limitations?
- Who would you say is the target demographic for LEARN?
- Is the usage of LEARN supported? If there are any issues with LEARN is there anywhere/anyone to turn to for support?
- What kind of support have you given your team when it comes to adopting/Using LEARN?
- What kind of support do you get from top management?
- What do you think are the factors for success? What is it that you have been doing to reach success?

Appendix 5. Interviews Schedule

<table>
<thead>
<tr>
<th>In-text “TAG”</th>
<th>Type of interview</th>
<th>Duration of the interview (CET)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trainer 1</td>
<td>Google Hangout video conferencing</td>
<td>1 hour</td>
</tr>
<tr>
<td>Trainer 2</td>
<td>Google Hangout video conferencing</td>
<td>1 hour</td>
</tr>
<tr>
<td>Role</td>
<td>Conference Type</td>
<td>Duration</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Manager 4</td>
<td>Google Hangout video conferencing</td>
<td>45 minutes</td>
</tr>
<tr>
<td>Manager 1</td>
<td>Google Hangout video conferencing</td>
<td>1 hour</td>
</tr>
<tr>
<td>Trainer 3</td>
<td>Google Hangout video conferencing</td>
<td>1 hour</td>
</tr>
<tr>
<td>Manager 2</td>
<td>Google Hangout video conferencing</td>
<td>1 hour</td>
</tr>
<tr>
<td>Trainer 4</td>
<td>Google Hangout video conferencing</td>
<td>45 minutes</td>
</tr>
<tr>
<td>Manager 3</td>
<td>Google Hangout video conferencing</td>
<td>45 minutes</td>
</tr>
</tbody>
</table>