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Adapting to Accelerated Digitalization of Learning Services

A Single Case Study of Global Service Training at Volvo Buses

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Abstract

This thesis aims to research the accelerated digitalization of learning services in a global context. The thesis further aims to research how a multinational company can leverage digital solutions to add value for their aftermarket. To fulfill this aim, the research is conducted in collaboration with the global bus manufacturing company Volvo Buses. More specifically, this study focuses on the case company's global service training in relation to the digital shift entailed by the Covid-19 pandemic. For Volvo Buses, the digital shift has accelerated the digitalization of service training. The purpose of this thesis is thereby to expand existing literature by offering a single case perspective on the challenges and opportunities connected to digitalization of learning services. To achieve this, previous research on knowledge and digitalization in relation to the learning process is reviewed. Moreover, the theoretical framework includes the discussion of digital solutions, including gamification, virtual reality (VR), augmented reality (AR) and e-learning. Empirical findings are derived from a qualitative data collection process consisting of twelve interviews. From the empirical findings, six themes are derived by using a thematic analysis. The identified themes are; *Collaboration, Information Online, Practical Learning, Learning in Online Format, Market Differences* and *Adopting Digitalization*. Market differences are found to permeate the findings as the case company operates globally. The themes are then discussed in relation to the theoretical framework. Based on this, the researchers are able to draw conclusions and address the study's research questions. The theoretical contribution of this study is to fill the gap regarding how global companies adapt to an accelerated digitalization of learning services, which is done through the single case study of Volvo Buses. In addition, specific recommendations are provided to the case company, which is the practical contribution of this thesis.

Keywords: *Explicit knowledge, tacit knowledge, knowledge transfer, knowledge sharing, knowledge transformation, information and communication technologies (ICTs), digital learning, digital tools, gamification, virtual reality (VR), augmented reality (AR).*

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1. Introduction

Training of employees serves as a central part of a company's added value to its aftermarket, and with a pandemic that characterizes the current state of the world, the manner through which training is conducted has been forced to adapt accordingly. Conducting training in a traditional way is no longer an option, and adopting digital solutions that allows for training to be carried out is a must. The purpose of this thesis is to research the digitalization of service training at Volvo Buses. The Covid-19 pandemic has increased the demand for and use of digital solutions. For Volvo Buses and their Global Service Training (GST) team, the effects of the pandemic on limited travels have accelerated the shift from conducting face-to-face training to offering learning services completely digitally. The GST team has successfully made use of several digital tools in their service training even before the pandemic, but there are still challenges remaining. This study aims to dive deeper into the challenges and benefits Volvo Buses is facing when conducting the training digitally and whether the knowledge requirements and learning objectives can be met through digital training. It also aims to study what value digital learning services can offer to the aftermarket and, in extension, provide guidance and perspective to the GST team in their future development of the train-the-trainer (TtT) sessions. TtT is commonly used to describe a teaching approach where experienced trainers train general trainers, who in turn train practitioners (i.e. Mayrhofer, Goodman, Smeeton, Handley, Amador, & Davies, 2016; Levine, Brett, Robinson, Stratos, Lascher, Granville, ... & Barry, 2007). This definition is the one used for this study.

1.1. Background

As the world proceeds to evolve and the pace of product and service development continuously increases, companies of all sorts need to ensure that they can train their workforce and thereby increase competence and ultimately customer satisfaction (Garavan, Carbery, O'Malley & O'Donnell, 2010). In regards to the ongoing Covid-19 pandemic, limited research has been conducted, especially in terms of its impact on organizations. However, what is clear from the limited research that has been carried out is that organizations,, as well as institutions, have been forced to adopt digital learning techniques and methods like e-learning to proceed with training and education (Favale, Soro, Trevisan, Drago & Mellia, 2020). Conducting education and training digitally is not a new phenomenon, as a matter of fact, it has been around for decades (DeRouin, Fritzsche & Salas, 2004). However, the extent to and context in which it is being carried out, and partially the means of how it is occurring, is of increasing relevance. With little to no option but to shift the traditional manner of how work is conducted to digital means, the usage of e-learning is speeding up both in educational institutions and firms' employee training (Favale et al., 2020).

Digital learning is an increasingly used means of conducting education and training and the benefits of it are being leveraged by firms as well as educational institutions (DeRouin et al., 2004). These methods are enabled by and rely on the globally widespread access of the internet and digital intercommunicating devices. To firms, this entails that the training of its employees can occur on-demand and enables the participants to have greater control over their learning process. In extension, this allows for a more effective learning process. To be more specific, digital learning is a modern training strategy for increasing peoples' knowledge and skills, as well as shifting the firms' culture and attitude towards a more digital and future adapted organization (Derouin, Fritzsche & Salas, 2005). Moreover, e-learning enables firms to train their workforces regardless of geographical and cultural differences and if done correctly, in a more cost efficient and competence effective manner (DeRouin et al., 2004). In addition to the convenience digital learning offers in terms of availability, it also promotes collaboration (Papanikolaou & Boubouka, 2010). Through implementation of systems which allow remote interaction, training participants can leverage the on-demand aspects of internet based systems, whilst helping each other to learn (DeRouin et al., 2004).

However, digital learning is not necessarily easy to implement (Derouin et al., 2005). Its success depends heavily on the design, availability and delivery of its methods, and tools used by the firm. These aspects will serve as pivotal in the outcome of the digital learning implementation. There are several tools available that, if implemented successfully, carry the potential of increasing the training quality significantly. At the same time, these tools can decrease the costs of training. In this thesis, digital solutions and tools such as e-learning, gamification, and virtual reality (VR) will be discussed. Discussing digital solutions is of interest as the aim of this thesis is to research how value can be added to Volvo Buses aftermarket training from using digital solutions, and the opportunities and challenges that digital learning services bring.

1.2. Problem Discussion

How the Covid-19 pandemic ultimately affects firms' adoption of digital means is difficult to predict. However, what remains clear is that the pandemic has sped up the pace of digital adoption as well as forced global firms to adapt to the new situation (Ting, Carin, Dzau & Wong, 2020). The digital transformation process serves as a crucial part of digitalization (Parviainen, Tihinen, Kääriäinen & Teppola, 2017). This means that not only the necessity for digital tools has increased, but so has the general acceptance towards them. Hence, the issue is not whether there are, or will be, any digital tools available, but rather the lack of preparation time. Companies were forced to rapidly adapt to the digital shift brought by the pandemic, wherefore the adoption time is increased. When circumstances change rapidly, it is difficult for companies to know what digital tools and solutions are available, what the internal acceptance is for those are and which of the tools and solutions available that best fit the internal aspects of the company (DeRouin et al., 2004).

For knowledge-intensive companies, it is a prominent challenge to ensure that knowledge can be transferred in a digital format and ensure that the same learning objectives are met. Personal experience and skills, also referred to as tacit knowledge, are inherently inarticulate (e.g. Hvorecký, Šimúth & Lipovská, 2015; Polanyi, 1966), wherefore it is challenging to transfer this type of knowledge to someone else. For organizations that can utilize and actualize its benefits, tacit knowledge presents a valuable asset (Stenmark, 2000). In previous research it is argued that social interaction is essential for knowledge to be shared and transferred between individuals (Özdemir, 2008; Tsoukas, 2005; Zack, 1999; Nonaka & Takeuchi, 1995). Conducting training on-site or face-to-face enables high levels of socialization, whereas it is challenging to achieve the same levels of social interaction through digital means. ICTs have a facilitating role in knowledge transfer, and can maintain the co-presence that is important for socialization, without the co-location (Boisot, 1998). This study aims to investigate the potential value added and possible social interaction from the use of digital tools such as VR, AR, gamification and e-learning.

Another issue that most organizations face is optimization. While there are numerous digital learning options to choose from, the implemented tools must be suitable for the given task. Re-allocating resources into one area in which digital learning could add value might prove more fruitful as that area in itself can be optimized, whereas other areas to which allocating resources might prove ineffective, should remain untouched. Transferring sharing and knowledge transfer are essential parts of digital learning and the topic has been quite extensively researched, even in the context of organizations (Harris, 2009). Although, it is important to acknowledge that most of the research on knowledge in relation to digital learning regards academia, not organizations. Most of the studies that have been conducted on organizations have offered a broader context and have lacked a more applicable approach than a single case study provides. The study also aims to contribute to the scarce research on the effect on an organization from accelerated and forced digital transformation due to unforeseen circumstances. This will be done through providing a practical example and on-hand actions for a case company that wants to digitalize their learning sessions.

1.3. Case Company - Volvo Buses

Volvo Buses is a part of the global manufacturing corporation Volvo Group, that operates in eleven different fields providing equipment, vehicles, and training all over the world and serves as one of the largest suppliers of commercial transportation solutions. Volvo Buses are market leaders and have been ever since 1928 when the company launched its first bus. The company employs more than 8 000 people and delivers about 9 000 vehicles annually, whilst also operating as a pioneer in electromobility. Ever since Volvo Buses was founded, safety and quality have been core values of the company. Volvo Buses has continued to operate at the frontline of technology and thereby delivered commercial transportation to the market with more safety and quality than its competitors. As time has progressed, the world has changed and so has Volvo Buses. While the two core values remain, an additional one has emerged, namely environmental care. The company aims to be the market leader in offering

sustainable transportation solutions, primarily through the aforementioned electromobility. (Volvo Buses, 2021)

While manufacturing and delivering buses is a central part of what Volvo Buses does, the aftermarket is a pivotal part of the company as well and it is in this part of the offering that Volvo contributes mostly to the vehicle's quality (Volvo Buses, 2021). To Volvo Buses, the aftermarket is made up of all the activities and occurrences that take place after the bus is sold to the customer. This includes services and repairs and together they serve as a core part of the value that Volvo Buses bring to its customers (Internal Document 1). The most important factor that generates quality in the aftermarket is up-time, which the company therefore focuses a great deal of its time and resources on (ibid). Up-time measures the time a machine is working and available, meaning its reliability. For this reason, the technical competence of the technicians that perform the service and repairs on the vehicles and thereby secure the up-time, is essential to Volvo Buses aftermarket performance. The technicians competence arises to a great extent through the training that Volvo Buses provides and therefore those sessions are critical to the company.

The technicians' training is conducted by market trainers (Internal Document 1). The market trainers themselves undergo training conducted by internal bus trainers from Volvo Buses global service training team (ibid). This is illustrated and further elaborated on in Figure 1 below. It is necessary to provide support, knowledge and skills to the trainers which conducts training for the technicians. The training sessions intended for market trainers are referred to as TtT, which stands for "Train the Trainer". The TtT sessions generally include both practical and theoretical elements and have previously been conducted in classrooms on-site. Providing training on-site entails time spent travelling and transportation costs (ibid).

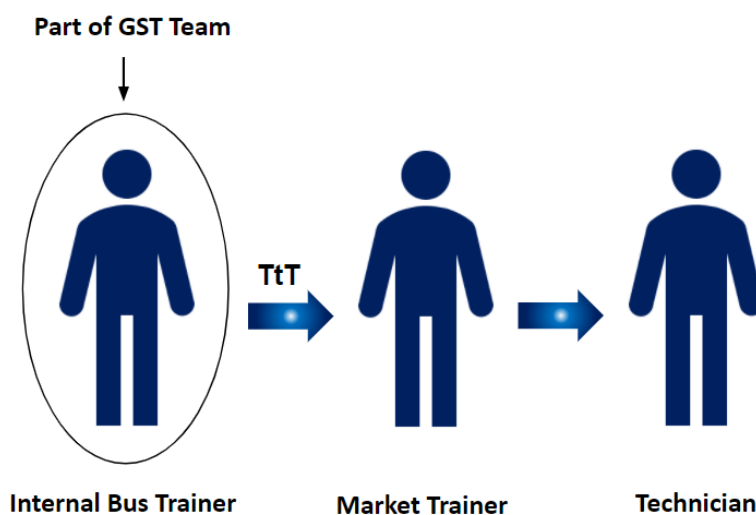


Figure 1. The relationship between trainers and training participants.

Further, in Figure 1, the internal bus trainer is a part of GST and is a member of the team that creates material for training sessions. The internal bus trainer then leads the aforementioned TtT sessions, in which he or she teaches the market trainer about the material. In the TtT sessions, the market trainer is the student, but after the TtT session conducts training on his or her own, however, this time with the technicians being the students (Internal Document 1). This is in accordance with Mayrhofer, Goodman, Smeeton, Handley, Amador, & Davies' (2016) description of TtT where experienced trainers train general trainers, who in turn train practitioners. In the case of Volvo Buses, the experienced trainer refers to the internal bus trainer, the general trainer as market trainer, and lastly, the practitioners are referred to as technicians.

Volvo Buses has a history of being a first mover (Volvo Buses, 2021). In line with this, the company began to investigate the possibility of implementing modern technical and digital solutions into TtT a few years ago and had already incorporated digital solutions in their service training before the pandemic struck (Internal Document 1). This has been further accelerated by the Covid-19 pandemic, which has disabled regular classroom training and instead forced the TtT sessions to be conducted completely in a digital format. Volvo Buses are therefore in the middle of researching which digital possibilities are available and could contribute to the TtT sessions and thereby the total value that is offered to the aftermarket (ibid). From communication with Volvo Buses, the researchers have learnt that this includes both theoretical and practical training. Other companies in Volvo Group have implemented VR and other digital solutions through which they have been able to certify trainers to some extent (Internal Document 2). However, Volvo Buses has not yet devoted resources to implementing similar solutions into their training.

1.4. Purpose and Research Questions

This study has been conducted with the purpose of contributing to the limited research around adaptability to a global phenomena, and how an organization can accommodate these uncertainties by implementation of digital solutions. Moreover, this research aims to provide an understanding of what is needed for Volvo Buses to successfully create and conduct learning services in a digital format. It will further provide the case company with assistance and support in their digital strategy to further implement and leverage digital solutions in their aftermarket training. There is not much existing research on how digital solutions can be used in this part of the value chain. Since the training material is already established, this study focuses on how the relevant knowledge should be shared and transferred through the use of digital solutions and tools to ensure that learning objectives are met in the digital service training. As part of this, it will be addressed whether digital learning offers the same knowledge exchange as on-site learning, and if so, what digital tools can be used to achieve these results. Challenges and opportunities that Volvo Buses faces from the digital shift that is accelerated by the ongoing Covid-19 pandemic are identified and discussed. This is done through a combination of theoretical and empirical research. The single case study of Volvo Buses enables a practical case to be put into a theoretical context and thereby, make the

results and findings more tangible. In line with the purpose, the following research questions have been derived:

Research Question 1: What are the main opportunities and challenges with the shift towards digital learning services at Volvo Buses?

Research Question 2: How can Volvo Buses leverage digital solutions to add value to the aftermarket learning service?

1.5. Delimitations

This study has several delimitations which affect the scope and potential findings of the conducted research. Firstly, the study is limited to the single case of the incumbent, multinational, and globally operating manufacturing corporation Volvo Buses. Aspects that are considered irrelevant in relation to the company Volvo Buses or the Volvo Group will be disregarded in this study, and characteristics of other companies or industries will not be discussed. The study will be limited to focus on aspects of importance for the digital learning services' function and use for trainers and technicians, as well as the market acceptance for digital solutions at Volvo Buses. In terms of digital tools, this study will be concerned with VR, AR, e-learning and gamification and disregard any other potential tools. Other potential usage and implementation of digital solutions will not be addressed, wherefore the findings might not be directly applicable to other external cases or companies. This study is delimited to the concepts of tacit knowledge and explicit knowledge, wherefore individual and collective knowledge will not be discussed. The delimitations taken were made due to the prerequisites given for the master thesis. Furthermore, the research is conducted in collaboration with the GST department at Volvo Buses, wherefore it is favorable to limit the scope of the study to only include this department at Volvo. The collaboration offers accessibility to information and internal resources that are valuable to answer the proposed research questions and fulfill the purpose of this thesis.

1.6. Structure of Thesis

In the previous chapter, the research was introduced with its purpose and research questions. In the following section, the researchers outline the successive chapters of the thesis. In chapter 2, a literature review is brought forward with the purpose of introducing the key concepts of this study. These include explicit and tacit knowledge, knowledge transformation, knowledge transfer, knowledge sharing, digitalization, ICTs, e-learning and digital tools. Furthermore, in chapter 3 the researchers discuss their methodology, which includes the choice of a qualitative research strategy, an interpretive research philosophy and the application of a single case study research design. Additionally, the researchers outline the data collection, both in terms of primary data that was gathered by using semi-structured interviews, and secondary data through an extensive literature review.

In chapter 4, the empirical findings of the research are brought forward and presented, with six themes having been derived from the data using a thematic analysis. The themes are discussed and citations are used to further clarify through examples of what the findings are stating. Moreover, in chapter 5 the analysis of the thesis is outlined and the researchers discuss the study's empirical findings in relation to the aforementioned key concepts that were reviewed in chapter 2. Thereby, the researchers find the gaps and similarities between prior research, and the findings of this research. Lastly, in chapter 6 the research questions that were derived in chapter 1 are answered by the researchers and the thesis' conclusions are outlined. Furthermore, the researchers present several recommendations for the Volvo Buses in its pursuit of digitalizing its service training. Finally, the thesis' limitations are discussed, as well as theoretical contributions and suggestions for future research, with the intention of clarifying how this research has contributed to the field of study and where academia elaborates on the research.

2. Literature Review

In this chapter, previous research on knowledge and digitalization will be presented. The literature review was used to create an overview of the topics discussed and as a basis to answer the research questions. It contains the various aspects of knowledge, along with discussions on knowledge transfer, sharing, and transformation. Moreover, the concept of digitalization will be presented as well as the tools and solutions that can be found regarding the phenomenon, including gamification, Virtual Reality (VR), Augmented Reality (AR), and e-learning.

Knowledge is a key concept when discussing the learning process, wherefore it is of great importance to first understand the two different types of knowledge (tacit and explicit knowledge), how they are connected and if it is possible to transform one type of knowledge into another. Further adding to the complexity of knowledge, the discussion is reliant on how and if knowledge can be transferred and shared between individuals. Knowledge transfer and knowledge sharing has been put in a new context due to digitalization. There is also an ongoing discussion as to whether knowledge sharing that was previously relied on face-to-face interaction can be conducted through digital means with the same result. It is a common understanding that information and communications technologies (ICTs) is one of the main enablers of online sharing of knowledge between individuals making it an interesting aspect to consider. ICTs also enable the use of digital solutions and tools, which can be incorporated in digital learning to increase the knowledge transfer online.

2.1. Explicit and Tacit Knowledge

Information can be presented in a great number of ways. The selection and transformation of information to knowledge determine how useful the information is (Smith, 2001). Knowledge in a business context is defined as relevant and actionable information that is to some extent based on experience (Leonard & Sensiper, 1998). Human knowledge can be divided into two basic types: explicit and tacit knowledge (Smith, 2001). Explicit knowledge can be defined as something that is easily understood and consists of facts, rules, and work procedures that can be shared easily (Hvorecký et al., 2015). Tacit knowledge consists of personal experiences, insights, and know-how that is difficult to express and embedded in a person's mind. Zack (1999) describes tacit knowledge as knowledge developed from experience, difficult to articulate, subconsciously understood, and applied and shared through interaction, shared experience, and storytelling. According to Polanyi (1966), all knowledge is tacit or can be derived from tacit knowledge. Socially mediated knowledge intertwines with experiences and the perceived reality of individuals (ibid). The relationship between explicit and tacit knowledge is that tacit knowledge gives meaning to the explicit knowledge, meaning that explicit knowledge is irrelevant on its own (Hvorecký et al., 2015). Tacit and explicit knowledge interact and are combined through the creative processes and activities of individuals (Nonaka & Takeuchi, 1995). Social interaction is thereby required for knowledge to be created, gathered, and transferred between individuals (Özdemir, 2008).

The difference between tacit and explicit knowledge can be distinguished using two different perspectives (Jasimuddin, Klein & Connell, 2005). One perspective is that knowledge is defined as belonging to either the category tacit knowledge or the category explicit knowledge, and that knowledge can be categorized using these classes. The other perspective on knowledge is that it is a form of a graded continuum, meaning that in a specific context, knowledge can demonstrate both tacit and explicit characteristics. The first perspective highlights the conventional dilemma derived from the discrepancy between the two knowledge categories. The second perspective draws on the reasoning of Polanyi (1966), who argues that knowledge exists on a spectrum, where knowledge can portray any composition of explicit and tacit knowledge. Jasimuddin et al. (2005) argue that the perspective of knowledge as a continuum offers more value in the formation of knowledge strategy in an organization. The continuum perspective offers the opportunity to shape a strategy that considers the advantages of both tacit and explicit knowledge. An example of how a strategy can incorporate this perspective is a strategy where organizational knowledge is rendered as tacit to external parties, but as explicit within the organization.

Lundvall and Johnson (1994) argue that knowledge is socially embedded and suggest that knowledge can be divided into four categories. The categories are 1) know-what (knowledge about 'facts'), 2) know-why (scientific knowledge), 3) know-who (specific and selective social relations) and 4) know-how (skills). The characteristics of the first two categories allow them to be incorporated in a database, whereas the second two categories are difficult to translate into codes and challenging to communicate in a way that creates value for the recipient. The know-who and know-how are embedded in and dependent on the social and cultural context (ibid). Not only tacit knowledge is reliant on the context, but explicit knowledge is also context-dependent (ibid). Examples of codes that must be learned to receive and share knowledge are foreign languages or technical terms.

Knowledge is an important strategic resource for organizations and how knowledge is managed is of great importance for the organization's success (Ipe, 2003). Understanding the creation, sharing, and usage of knowledge is critical to be able to capitalize on the knowledge present in the organization (ibid). Tacit knowledge is recognized to have a central role in firms' competitive opportunities (Howells, 1996). It is also a key element in organizational learning. Howells (1996) highlights the importance of considering tacit knowledge in a dynamic environment and that it can be acquired and transferred between a number of organizational levels. The levels can be identified on an individual, group, firm, and inter-firm basis (ibid). Polanyi (1966) discusses tacit knowledge at an individual level, whereas Nelson (1985) addresses tacit knowledge present in a group setting. Nelson (1985) argues that it is the tacit knowledge embedded in routines and common understanding within an organization which maintains the organization's structure and coherency. Both tacit knowledge and explicit knowledge are underutilized in organizations, wherefore it is valuable for organizations to gain an understanding of how to make sense of and use knowledge present in the organization (Smith, 2001). It is further argued that knowledge sharing is reliant on the presence of worker-centric environments where sharing is encouraged in the

organization. The lack of incentive for individuals or groups to explicate the tacit knowledge providing a competitive advantage is a prominent reason why knowledge remains tacit. Another reason is that individuals are not aware that they possess tacit knowledge that could be valuable (Leonard & Sensiper, 1998).

2.1.1. Knowledge Transformation

Tacit knowledge is not equivalent to knowledge that can not be explicated (Spender, 1993). However, the inherently elusive nature of tacit knowledge makes it difficult to capture, store and share (Stenmark, 2000). Some dimensions of tacit knowledge are not likely to be transformed into explicit knowledge (Spender, 1993). This is due to the common element in tacit knowledge that it is difficult to articulate (ibid; Polanyi, 1966). In contrast to Polanyi's (1966) commonly accepted definition that tacit knowledge is by nature inarticulate, Nonaka and Takeuchi (1995) argue that tacit knowledge is knowledge that must be translated or converted into explicit knowledge before it can be utilized (Nonaka & Takeuchi, 1995). Below in Figure 2, this is illustrated and clarified further. This view of tacit knowledge is based on the conventional perception that it is inefficient and difficult to transfer (ibid). Tacit knowledge is a valuable asset, which entails challenges for organizations in fully utilizing and actualizing its benefit (Stenmark, 2000). Many researchers argue that to be able to benefit from tacit knowledge it must first be transformed to explicit knowledge, which is easier to capture and disseminate.

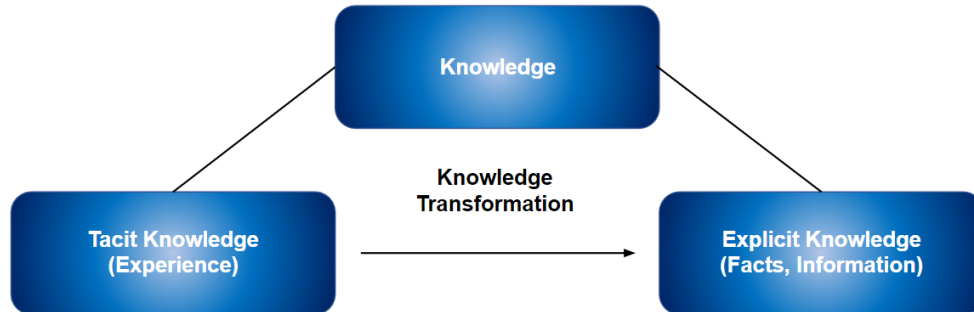


Figure 2. Different types of knowledge and Knowledge Transformation.

In Figure 2, knowledge is depicted as according to Smith (2001) and the process of transforming knowledge from tacit to explicit is illustrated in accordance with Nonaka & Takeuchi (1995), where it is argued that tacit knowledge is difficult to translate, and must be transformed to explicit knowledge before it can be utilized. Herschel, Nemati, and Steiger (2001) argue that converting tacit knowledge to explicit knowledge is a prerequisite for knowledge to be amplified and thereby incorporated in the knowledge network of the organization. Furthermore, the quality of the output from the conversion process of tacit knowledge into explicit knowledge is improved by a well-functioning structure and how the structure is applied to the conversion process.

The process of turning tacit knowledge into explicit knowledge presumes that the tacit knowledge can be identified, that it will create value on a personal level, and that the transition does not imply that a valuable competitive advantage is given up (Stenmark, 2000). Often, these presumptions are not correct, wherefore the process fails. Tsoukas (2005), argues that it is unsustainable to attempt to convert tacit knowledge to explicit knowledge and that the attention should instead be drawn to transforming the way people relate and communicate to each other. Tacit knowledge cannot be operationalized, yet, re-shaping interactions, communication, and how people connect can offer opportunities in utilizing the tacit knowledge within organizations (ibid). Tacit knowledge emerges in actions, and new knowledge emerges as tacit knowledge is enlarged through social interactions – not when tacit knowledge becomes explicit knowledge. According to Stenmark (2000), using systems and intranet documents enables knowledge sharing within the company without transforming tacit knowledge into explicit knowledge. This implies that tacit knowledge expressed in a different form can be included in information technology and thereby, tacit knowledge of professional interest can be shared within the organization.

2.1.2. Knowledge Sharing

Knowledge sharing is defined as providing task information or know-how, for example through written correspondence or communication in person (Cummings, 2004; Dorsey, 2003). Nonaka and Takeuchi (1995) suggest that knowledge sharing is vital to create knowledge in an organization. Four basic patterns of knowledge creation are discussed. The first one is when tacit knowledge is shared with another individual. The knowledge sharing allows for the second individual to include the tacit knowledge in their own knowledge base through socialization. This knowledge is, however, difficult to leverage within an organization as it is not explicated. The second pattern found is the sharing of explicit knowledge. The explicit knowledge can easily be obtained by other individuals, but does not significantly extend the organization's knowledge base. An organization's knowledge base is argued to be extended when tacit and explicit knowledge interact. The third pattern brought by Nonaka and Takeuchi (1995) is when tacit knowledge is articulated in such a way that it becomes explicit knowledge and can be shared with larger parts of the organization. The final pattern identified is when the sharing of explicit knowledge results in internalization. This means that the recipient uses the explicit knowledge to extend or re-shape their existing tacit knowledge. The two final processes, articulation and internalization, require personal commitment, wherefore it is crucial in the extension of the knowledge base (ibid). The reasoning of Nonaka & Takeuchi (1995) is reliant on the understanding that tacit knowledge can be communicated, contrasting to Polanyi's (1966) definition that tacit knowledge is permeated with personal insights and perceptions which entails that it is sometimes inarticulable. This discrepancy is pointed out and discussed by Tsoukas (2005), who argue that the assumption that tacit knowledge can be articulated is erroneous.

Employee knowledge is an increasingly vital competitive advantage wherefore the understanding of knowledge sharing is growing in importance and becoming crucial, especially in knowledge-intensive industries (Grant, 1996). A firm's competitive advantages

can be sustained and even increased from successfully encouraging knowledge sharing among the employees (Liu & Phillips, 2011; Grant, 1996; Barney, 1991). Employee knowledge sharing improves a firm's performance in terms of e.g. innovation capability and absorptive capacity (e.g. Liu & Phillips, 2011). Knowledge sharing between team members is of great importance in ensuring high productivity levels for both the group and the organization (Choi, Lee, & Yoo, 2010). Despite it being a shared understanding for many managers that knowledge sharing is essential to encourage and establish within the company, the exploration of factors affecting the employees' behavior in sharing knowledge is limited (Bock & Kim, 2002).

It is a common belief that organizational rewards motivate and influence the employees' incentives to share knowledge (Hau, Kim, Lee & Kim, 2013; Bock & Kim, 2002). Jiacheng, Lu, and Francesco (2010) found that rewards indirectly affect the individuals' intentions through identification, but there is little direct influence on their attitude on knowledge sharing. Bock and Kim (2002) found that expected rewards did not have a significant impact on the employees' attitude on knowledge sharing. Bock, Zmud, Kim, and Lee (2005) mean that anticipated extrinsic rewards affect the individuals' intentions to share knowledge in a negative way. Hau et al. (2013) found a variance in the intentions on sharing tacit knowledge or explicit knowledge. Employees' tacit knowledge sharing intentions were affected negatively by organizational rewards (ibid). It further showed that organizational rewards positively affect explicit knowledge sharing intentions among employees. Social capital, reciprocity, and enjoyment increase the employees' knowledge sharing intentions, in both tacit knowledge and explicit knowledge.

Social aspects especially enhance the tacit knowledge sharing intentions. Hau et al. (2013) argue that individual motivations and social capital - two knowledge management research streams - are key influencers in knowledge sharing. Bock and Kim (2002) highlights a positive attitude towards knowledge sharing as the main accelerator of effective knowledge sharing behaviors. Knowledge held by individuals is not easily translated into organizational knowledge even when knowledge repositories are present or implemented (Bock et al., 2005). Individuals have tendencies to keep the knowledge to themselves due to subjective norms (ibid). Their intentions on knowledge sharing are determined by the subjective norms in combination with the organizational climate. The subjective norms are in turn affected by the organizational climate and the individuals' sense of self-worth (ibid). The knowledge sharing intentions are also influenced by the anticipated reciprocal exchange of knowledge and its value for the individual (ibid). Kwok and Gao (2005) argue that knowledge sharing and knowledge integration require trust and are reliant on organizational identification and organization-based self-esteem. An employee's trust is a summary of their trust in the organization, their colleagues, and the management. Furthermore, trust is a dependent variable that is affected by cultural differences. Kwok and Gao (2005) found that trust has a positive impact on knowledge sharing and knowledge integration. In this context, trust is a precondition for knowledge sharing and knowledge integration, but trust as a condition is not enough on its own to actualize it.

Teams fill an essential role in knowledge resources being leveraged in contemporary knowledge-based organizations (Choi et al., 2010). To support the teams and knowledge sharing, investment in information technology is a common practice in organizations (ibid). Simultaneously, transactive memory systems (the division of team members specialized in cognitive labor relating to retrieval, encoding and storage of knowledge) play an important role in team performance (ibid). Choi et al. (2010) further found that the development of transactive memory systems in teams is positively influenced by the organizations' IT support. Both the transactive memory system and IT support positively affect knowledge application and sharing of knowledge, which in extension improves team performance. However, in order to improve team performance through knowledge sharing, organizations need to ensure that the knowledge shared is applied. Knowledge sharing is not enough on its own.

Jiacheng et al. (2010) offer a cross-cultural perspective of individuals' knowledge sharing intentions and the factors that influence the inclinations to share information. Individuals' intrinsic motivation generates personal and affective commitment (ibid). There are indications that cultural differences entail different approaches to knowledge sharing initiatives. Some cultures are more inclined to comply with directions to avoid conflicts in a group, whereas others are more individualistically inclined (ibid). To the former culture, knowledge sharing is a means of achieving a consonant group and ensuring equal relationships (ibid). The more individualistic approach engages in knowledge sharing, as their individual accomplishments are perceived to manifest their self-worth. In general, individuals' intrinsic intentions can be derived from personal norms in combination with social norms.

2.1.3. Knowledge Transfer

The process of knowledge transfer refers to the evolvment and transformation of knowledge (Roberts, 2000). The transfer occurs through the diffusion of knowledge between individuals (ibid). Knowledge transfer differs from knowledge sharing in the sense that knowledge transfer involves both knowledge sharing and application of the shared knowledge by the recipient (Szulanski, Cappetta, & Jensen, 2004). The difference between knowledge sharing and knowledge transfer is illustrated in Figure 3.

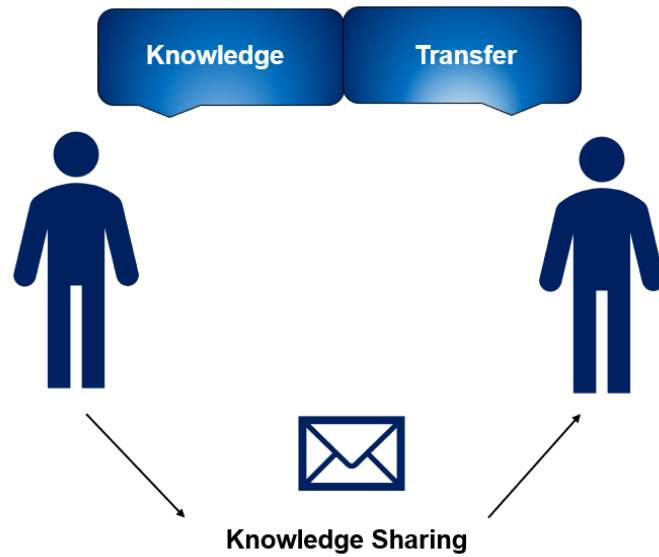


Figure 3. Difference between Knowledge Sharing and Knowledge Transfer.

In Figure 3, knowledge sharing is depicted as correspondence providing task information or know-how (Cummings, 2004; Dorsey, 2003). Moreover, in accordance with Roberts (2000), Figure 3 illustrates that knowledge transfer occurs through the diffusion of knowledge between individuals. Lastly, the difference between the two is pictured as knowledge transfer involves both knowledge sharing and application of the shared knowledge by the recipient (Szulanski, Cappetta, & Jensen, 2004). Socialization, education, and learning offer opportunities for knowledge transfer, which in extension contributes to creating new knowledge (ibid). Knowledge can either be transferred on purpose or it can be transferred unintentionally as a result of unrelated activities (ibid). Knowledge transfer can be considered to be related to the wide definition of technology transfer. Charles and Howell (1992) describe technology transfer as the dissemination of complex knowledge of a type of technology. In relation to technology transfer, the most interesting aspect is the individuals' role in initiating and enabling the transfer between locations and organizations through person-to-person communication (Ounjian & Carne, 1987). In extension, encouragement in social communications promotes knowledge transfer.

Acquiring tacit knowledge is generally a time-consuming process (Roberts, 2000). There are elements of tacit knowledge that can exclusively be successfully transferred by demonstration or face-to-face contact between the teacher and the learner (ibid). Successfully transferring tacit knowledge is reliant on mutual trust (ibid). Trust is determined by the social context, and the levels of trust are influenced by and vary depending on culture and country (ibid). It is particularly important for firms operating cross-border to consider the differences in the level of trust to facilitate the exchange of knowledge between the different cultural and national departments. In general, relationships and trust are created and shaped by high levels of socialization and face-to-face contact (ibid). Simultaneously, the benefits of face-to-face interaction can balance out potential communication difficulties with language and cultural differences (Boutellier, Grassmann, Macho & Roux, 1998). Similarities in culture and

linguistics between individuals increase the success rate of technologically mediated communication. However, as individuals of diverse backgrounds continuously interact, a new social context will emerge and facilitate the creation of trust and knowledge transfer. An increase in social and cultural exchange between individuals entails an increase in knowledge transfer (Özdemir, 2008).

2.2. Digitalization

Digitalization has over the past few decades become an increasingly discussed topic in academia as well as the corporate world (Fossen & Sorgner, 2019). The concept springs from the conversion of information into digital bits and could perhaps most suitably be defined as the manner of turning numerous aspects of life into communication and structures that are built through digital means (Brennen & Kreiss, 2016). Whilst digitalization can be applied to essentially all aspects of life through for instance smart homes and mobility, organizations and corporations are perhaps those that can best leverage the benefits of it (Gray & Rumpe, 2015). From a business-oriented perspective, digitalization aims to re-shape the business model and the process of value creation (ibid). There are numerous benefits to be reaped for those firms that choose to digitalize their operations. Advertisement can become more precise and more accurately targeted towards the group of interest (Kotarba, 2017), manufacturing more efficiently done and service provided to a much more accurate extent (Björkdahl, 2020).

Digitalization as a concept is applicable on multiple levels, including a societal level and organizational level, but regardless of which level one refers to, digital transformation will serve as a pivotal part in the process of digitalization (Parviainen et al., 2017). The idea of digital transformation is a product of changes in the approach to work, roles, and offers that are originating from the introduction of digital means in the organization or the environment in which it is operating. The possible upsides of digitalization are clear (Nambisan, Wright & Feldman, 2019). Firstly, through information streams that have the potential of becoming much more efficient by using digital tools and lower costs significantly (Gobble, 2018). Secondly, turnaround times can be improved immensely as orders and processes are carried out instantly. Moreover, by implementing digital solutions, companies can use these softwares to automatically gather data continuously and thereby to a much greater extent understand the performance of numerous aspects of their business, including where risk arises from and cost drivers (Parviainen et al., 2017).

However, it is critical to understand that digital transformation does not occur effortlessly and that a number of obstacles must be overcome before one is able to fully leverage its benefits (Parviainen et al., 2017). The issue is rarely to see the potential benefits, but rather what the challenges are. The project of digital transformation consists of introducing digital capabilities that support the transition of the business model, which in turn has an impact on the organization at large (ibid). Operation processes, resources and assets, and the value creation itself will experience changes (Bican & Brem, 2020). This means that the overall

approach is influenced as digital tools impact collaboration and interaction. Historically, organizations have failed to successfully implement a digital transformation strategy due to the inability of adapting to the company's mindset and processes (Parviainen et al., 2017). Thereby, the organizational culture will have to be re-shaped as well. Often the motivation behind the failure is the difficulty to outline a digitalization strategy and find common ground in which aspects of the organization that should be prioritized in the transformation (Mergel, Edelman & Haug, 2019).

Even from an educational point of view digitalization serves its purpose, which can be well exemplified by the pandemic that has characterized the last year. The Covid-19 pandemic has increased the pressure on organizations to digitalize their operations to manage the digital shift (Coeckelbergh, 2020). As an example, it has accelerated the demand for digital solutions as employees work from home and education is conducted online. This stresses the importance of discussing not only the content of education but also the medium through which the education occurs. Although the world at large seems to have been too slow to digitally transform, there still has been a steady increase in technological methods and tools in educational formats (Sousa, Cruz & Martins, 2017). The aim of introducing these new methodologies has been to increase collaboration and critical thinking and the result appears to be positive, with an increase in teaching quality in regards to resources and time allocation (ibid). However, perhaps the greatest impact is the increase in deeper learning as digital learning allows for a more personalized and collaborative approach to learning (Mok, 2021).

While global digitalization has progressed over the past few decades, one of the shifts' main pillars - the ability to spread, share, store and access information - has enabled people to integrate with and obtain a large amount of information (Bawden & Robinson, 2009). However, this is not without challenges. One of the main obstacles that the world, organizations, and people in it are facing in terms of information is the concept of information overload (ibid). The idea is that with such a large amount of information being available for everyone, it becomes overwhelming as all information is not relevant or helpful (Bawden, Holtham & Courtney, 1999). Interestingly, communication and sharing of information is an essential part of our everyday life, and thereby, ensuring that an overload of information is avoided is crucial. Information overload entails several issues. For example, people feel overwhelmed and discouraged to obtain the immense quantity of information, it becomes more difficult to identify which information is relevant, the control of which information that is shared is negatively affected and the quality of information suffers as a consequence (Bawden & Robinson, 2009).

Moreover, research has indicated that people who have experienced information overload are less likely to be open to adopting new digital solutions and more reluctant to changes in their work overall (Rutkowski & Saunders, 2010). Ensuring that the way in which information is communicated and knowledge is transferred and accessed is done correctly can reduce this issue (Bawden & Robinson, 2009). By transferring the information that is relevant and to the point of the communication's purpose, information overload is less likely to be present (Bawden et al., 1999).

2.2.1. Information and Communication Technologies (ICTs)

There is a widespread understanding that information and communications technologies (ICTs) have a great impact on the sharing of knowledge between individuals (Hildrum, 2009). Hildrum (2009) challenges the common understanding that communication mediated by ICT is insufficient to distribute tacit knowledge, and argues that advanced e-learning systems enable successful sharing of tacit knowledge among internationally based technicians. ICTs enable the fast and cheap collection, storage, and sharing of data (such as images, videos, and texts) entailing knowledge creation and the process of knowledge diffusion (Roberts, 2000). ICTs are especially favorable for transferring explicit knowledge that can be reduced to data (ibid).

The transfer of tacit knowledge is often overlooked in the discussion of knowledge transfer through ICTs (Lamberton, 1997). Transfer of tacit knowledge through ICTs would require that the tacit knowledge can be transformed into information and then on to data, which is not the case as the final data will be incomplete (Roberts, 2000). Tacit knowledge transfer demands proximity between the teacher and the learner (ibid). Digital tools such as video conferences or virtual rooms can assist the tacit knowledge transfer but they can not yet replace or replicate the face-to-face communication required to successfully transfer tacit knowledge (ibid). Co-location and co-presence further facilitate establishing the trust necessary for knowledge transfer. Individuals located in different countries can simultaneously take part in identical explicit knowledge through a distributed document, but they can not take part in the same tacit knowledge without a shared social and cultural context. At most, a significant degree of overlap can be found between the tacit knowledge possessed by members of a group. The success of knowledge sharing is dependent on the recipients' motivation to obtain new knowledge through online means (Hildrum, 2009). The recipients' motivation can be promoted and evoked through involvement in networks of practice in online formats (ibid). A prerequisite for online knowledge sharing to entail access and benefits is that the user must possess a threshold level of technical knowledge relevant to the topics. This prerequisite is easiest to create in local communities of practice (ibid).

Boisot (1998) presents a different perspective on the ICTs' role in facilitating knowledge transfer. ICTs enable information that was previously dependent on face-to-face communication to be disseminated instantly and on a global scale. Further, Boisot (1998) claims that ICTs make it possible to maintain co-presence without co-location. Co-presence is created when ICTs and a shared social and cultural understanding are combined. Consequently, ICTs expand the relationship of trust to include a larger cultural and geographical diversity. A multinational enterprise can benefit from a strong organizational culture that encourages the creation of globally accepted norms and including socialization into the organizational culture in pursuit of establishing trust between employees separated by distance (Roberts, 2000).

2.2.2. Digital Learning

It is stated by Yoon, Kwon, and Shim (2012) that Jay Cross first proposed the concept of digital learning in 1999. Since then, several different explanations have been proposed. One definition is the view of digital learning as delivering digital media (images and text etc) through the internet and that the learning contents and methods of teaching aim to enhance learning, improve the effectiveness of teaching, and promote the development of personal skills and knowledge (Holzberger, Philipp & Kunter, 2013). Kaklamanou, Pearce, and Nelson (2012) describe digital learning as the application of computers and network technology media to situations of learning. Digital learning is an umbrella term that includes the commonly used concept of e-learning. E-learning is in turn defined as learning that is supported by media and digital electronic tools (Hoppe, Joiner, Milrad & Sharples, 2003).

Globalization has put increasing pressure on knowledge sharing, which has increased the role of e-learning in making knowledge available internationally (Irfan & Shaikh, 2008). E-learning brings numerous opportunities in terms of accessibility and speed, but improvements must be made to fully utilize this technology. To ensure that the knowledge is delivered accurately, the quality and processing of current training systems must be improved (Falconer, 2006). For an individual to learn, both the tacit and explicit knowledge must be enhanced and expanded (ibid). E-learning demands new teaching methodologies and techniques than what is used in traditional (on-site) learning. There is no significant difference in the development of explicit knowledge between e-learning and traditional learning, whereas e-learning offers great challenges in the development of tacit knowledge (Hvorecký et al., 2015). The students' tacit knowledge generally differs depending on the presence of the educator.

Hvorecký et al. (2015) present the Nonaka-Takeuchi model of learning (derived from Nonaka & Takeuchi, 1995), where four stages have been identified to combine the creation of both explicit and tacit knowledge. The four stages are socialization, externalization, combination, and internalization. All four stages come with specified teaching activities designed to develop new knowledge. In the socialization stage, the focus is on communication between the educator and the students as well as between the students. Externalization promotes the students to demonstrate their knowledge legibly. In the combination stage, the students' existing knowledge is elaborated and shared with other students. During the internalization stage, the students interweave their knowledge to incorporate it with their existing knowledge system. For e-learning to be effective, it must involve these four components appropriately and suitably. Irfan and Shaikh (2008) further highlight the importance of adaptation of e-learning in consideration of students with different aptitudes, backgrounds, and interests.

Yi (2006) states that as a result of information technology, knowledge sharing online has become more common than knowledge sharing face-to-face. A common discussion is how tacit knowledge can be externalized through environments online. According to Yi (2006),

the most efficient way for tacit knowledge to be shared in online environments is through the sharing of the participants' personal experiences. Many researchers agree that one of the most prominent disadvantages of e-learning is the absence of face-to-face interaction (Özdemir, 2008). Whether both tacit and explicit knowledge can be learned through e-learning environments is a recurring concern. This can be derived from Polanyi's (1967) reasoning that not all knowledge can be articulated. Learners learn beyond what is written or said through observations of a teacher's or friend's behavior and actions (ibid).

Web-based technologies are suitable for transferring texts, pictures, and audio of different forms (Özdemir, 2008). Knowledge can be codified through the use of these tools and content can be communicated to the learners and accessed at any time and place (ibid). Information provided online is independent of time zones and can be easily updated. Despite the suitability of e-learning environments in disseminating information and transferring explicit knowledge, it is not indisputably an appropriate way of teaching (ibid). E-learning alters the nature of learning activities by emphasizing self-studies and self-evaluation for the learners (Romiszowski, 2004). However, offering existing instructional content to students in a web format in e-learning environments does not automatically generate knowledge creation or knowledge transmission from student interaction (ibid). According to Moallem (2003), interaction is critical for distance learning to be successful, yet it is lacking in e-learning environments.

2.2.3. Digital Tools

There are three ways in which digital means increase deeper learning; personalized skill-building through leverage of data for the individual, tools that increase collaboration, and extended access by storing information and data at a single access point (VanderArk & Schneider, 2012). This can be done in a number of ways, seeing recorded lectures or videos being increasingly used at universities as a means of bringing the knowledge to the students as well as allowing for the students to go back and review the videos (Hunter, 2015). Thereby, the material can be viewed over and over again until the student feels as though he or she understands the material. While digital means promote a larger interaction in terms of the number of people learning, the risk is that the trade-off results in a less direct and thereby less qualitative learning experience (ibid). However, academics have argued that a more digital learning process could increase the interaction and allow for more individual responses in regards to answering questions and provide more direct responses. By leveraging the fact that most people have access to smartphones, tablets, and laptops, universities have shown an increase in student interaction with responses in real-time as well as feedback (ibid). This was done through an introduction of applications in which the students were able to anonymously ask questions, during the lecture and increased collaboration as discussions could take place to a much greater extent through open-chat forums in the applications. In Figure 4 below, the researchers of this thesis illustrate the ICTs' role in facilitating the use of digital tools and solutions in learning.

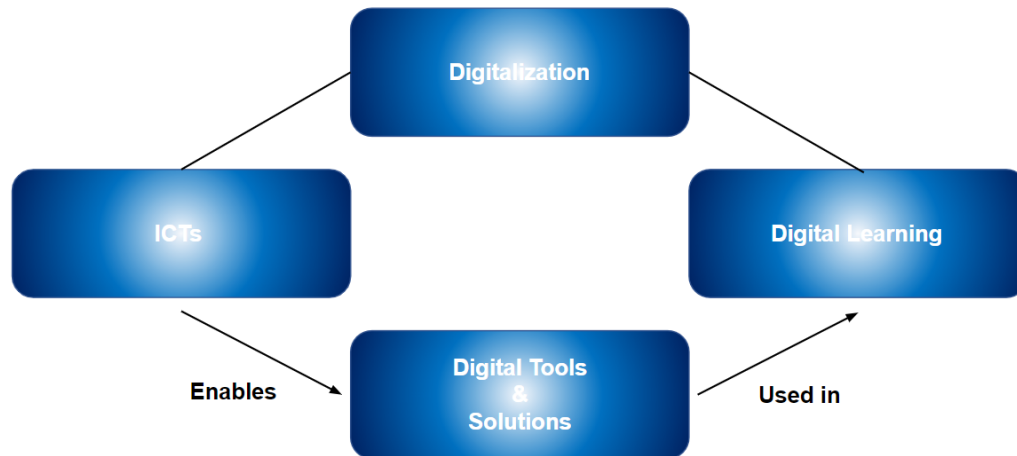


Figure 4. Relationship between the concepts digitalization, ICTs, digital learning, and digital tools and solutions.

In Figure 4, it is illustrated that both ICTs and digital learning are related to digitalization. ICTs enable the use of digital tools and solutions in a valuable manner, which in turn can be leveraged in digital learning. As an example, a study conducted by Hunter (2015) shows improvements in the learning process from incorporating digital methods. By providing students with the goal of a task in a given field of study and then allowing for the students to find the solution to reach the given goal by themselves, academic performances have been recorded as improved (Hunter, 2015). Through the leveraging of smartphones and other digital units, the students were able to use cameras, audio recordings, blogs, and chats to communicate to the educator during the experiments as well as submitting the final answers (ibid). Thereby, students managed to collaborate and leverage each other's skills to increase the performance and the quality of the experiment. Naturally, this stresses the importance of implementing hardware and software that enables these types of channels to be used (Land & Bayne, 2011). Luckily, most digital units today are able to support digital learning to some extent as can be exemplified by the aforementioned experimentations.

2.2.3.1 Virtual Reality (VR)

In the case of implementing more developed methods of digital learning, far more advanced hardwares and softwares need to be introduced to the learning process (Land & Bayne, 2011). Virtual Reality, VR, is one of those technologies that can be leveraged to support digital learning and centers around the idea that the object is placed inside a computer manufactured simulation in three dimensions that the object then interacts with (Liagkou, Salmas & Stylios, 2019). In the context of learning, VR is often used in Virtual Reality Learning Environments (VRLE), with the intention that the object will learn in a more intuitive and exciting environment (ibid). By triggering the learner's imagination through interaction with the simulation the barriers of learning are meant to be lowered as the learner can interact with his or her environment safely and excitingly (ibid). Implementing VR into learning does, however, come with challenges as more hardware needs to be introduced to the learning

through for instance VR-goggles (ibid). In addition to the hardware, the software needs to be developed as well since it is in the actual software that the learning environment is created.

One of the many areas of learning that have begun to implement VR into its practices is in the training of technicians for maintenance where its usage has become increasingly accepted and desired as a platform upon which to facilitate the training (Numfu, Riel & Noël, 2019). Maintenance in itself is the process during which repairs and service is conducted on machines or other units so that they can continue to function properly and safely (ibid). At the very core of it, maintenance consists of the knowledge, skills, and ultimately the competence of the technicians that do carry out the services and repairs on the machines. This is obtained by the technicians through training and experience and the more time they spend on these activities the more they ultimately learn (ibid). The traditional learning methods such as job shadowing, manuals, and certifications are becoming increasingly out-phased and ineffective by modern means of training, such as VR (ibid). The primary reason is really that while the modern solutions do carry initial costs, they tend to the central aspects of learning; visual, auditory, and verbal, to a much greater extent. Again, the initial costs of the company might be rather heavy, serving as one of the main obstacles to VR implementation into maintenance training. However, over time VR usage allows for more qualitative training in less time as practical learning can occur to a much greater extent and in an even safer manner.

2.2.3.2 Augmented Reality (AR)

Another tool that has been used to enhance e-learning is augmented reality, AR, which centers around the idea of using systems to augment the world around the user (Lee, Choi & Park, 2009). AR can be applied to several areas, including learning as it leverages visual and auditory elements to the learning experience (ibid). One of the benefits that AR brings to the user's learning is the clarity and the fact that it holds the potential to add a different perspective on what it is that is meant to be learned relative to traditional learning (ibid). The concept is however, not to be confused with VR. While the two are concepts that apply to learning and possess the ability to increase the learner experience, they are different in one critical aspect - AR is applied in a real environment, whereas VR is not (Farshid, Paschen, Eriksson & Kietzmann, 2018). The VR environment can be built to be a replica of a real place, but it is still an environment that is built in a VR system. AR is data that has been added on top of the actual reality, whereas VR is a digital representation of the actual world (ibid). From a learning perspective, AR is meant to provide insights into different parts of reality, meaning that reality plays a central part in AR (ibid). Reality can interact with augmentation if, for example, an object is recorded and then put into the augmentation program (Alkhatabi, 2017).

Studies have shown that by leveraging AR, students have experienced an increase in motivation and improved parts of learning that are meant to be practical (Lee, 2012). Generally, there has been a resistance towards AR because it much like VR requires heavy initial costs in developing or acquiring hardware and software as well as maintaining and updating the systems once they are up and running (ibid). Another issue has been related to

the integration of AR to function along with the traditional methods that companies often use (ibid). However, as time has progressed those barriers have been lowered as more evidence is not available that points towards the benefits of AR. Mainly, these benefits are found in the increased clarity and visual demonstrations of whatever it is that is meant to be learned (ibid). If done properly, AR is argued to be an enhancement to workers and managers alike through increased collaboration, skill-learning, explainable and guidable content that in a much clearer way than traditional approaches, can show people how something works (ibid). For instance, a company that manufactures a car would be able to not only design a car and then use AR to show the different components of the car, but also add digital or virtual comments that help guide for instance a technician that is attempting to repair the car (ibid).

2.2.3.3 Gamification

One of many digital methods that are being increasingly used in education is gamification. The concept centers around the idea that game-like means are introduced to the learning process with the intention that it will decrease the threshold to adopting knowledge (Hamari, Koivisto & Sarsa, 2014). Usually, that is done by implementing mechanisms and other elements into the learning system which increases either or in combination the enjoyment and the clarity. Previously conducted research indicates that in the majority of cases, gamification generates at least some sort of positive effect (ibid). Either the attitude, motivation, or enjoyment of learning was impacted positively, although the degree to which the effect contributed differed depending on the visuals, auditory and individual characteristics of the users (Seaborn & Fels, 2015).

Gamification at large can be implemented on numerous levels, stretching from the most simple and standardized means to much more individually adapted user-centered gamification (Klock, Gasparini & Pimenta, 2019). The primary obstacle to overcome in user-centered gamification is often that the user experience is unique and it is likely that the solution is not “one size fits all”, but instead the game-implemented aspects must be adapted to the uniqueness of individual humans. The risk then becomes that the gamification solution turns ineffective, as users feel disinterested by the necessity to learn in a manner that does not promote their individual characteristics (Buckley & Doyle, 2017). What is crucial to understand is therefore that the user experience is determined by the full set of interactions with the gamified system, which includes the knowledge found in the system, the emotional experience of the interaction, and the sense of meaningfulness (Seaborn & Fels, 2015). How this is obtained by the user might vary as there are a number of ways of delivering the experience, namely by auditory, visual, or senses that contribute to the cognitive experience (Klock, Gasparini & Pimenta, 2019; Hekkert, 2006).

The aspect of meaningfulness is mostly related to the support and guidance of the user to achieve the objectives of the tasks that are presented as a means of learning, best performed through adaptation of the system interaction based upon the user profile (Marache-Francisco & Brangier, 2014). It is also related to the motivation of the user during the system interaction as it serves as the key driver behind the users’ willingness to keep interacting with

the system (ibid). This is where the emotional side of gamification comes into play as the emotional manipulation of the user interaction induces the user to engage with the system. User-centered gamification can most effectively be implemented by using an iterative process that begins with identifying who the user is and from thereon builds the user profile (Klock et al., 2019). By iteratively allowing the system to review the user experience and gathering empirical data from it and thereby adapting it step by step until the user experience is unique to the individual (ibid). Therefore, the central focus of user-centered gamification is in the design and the development of the interaction to fit the individual and his or her ability to achieve the objectives.

2.3. Synthesis of Literature Review

The purpose of this section is to synthesize the literature that is relevant to address the research questions and the purpose of this study. Given that the literature serves as a pivotal part in understanding the aforementioned aspects of knowledge as well as digitalization and digital tools, it is favorable to provide an overarching synthesis of the chapter before moving on. As can be seen in Table 1 below, the key concept is stated on the left hand side of the synthesis, whereas the main findings of the concept from the secondary data is found on the right hand side.

<u>Key Concepts</u>	<u>Key Takeaways</u>
Explicit and Tacit Knowledge	Explicit knowledge (facts, info) and tacit knowledge (personal experience) are two types of knowledge. Tacit knowledge gives meaning to explicit knowledge. Tacit knowledge presents a great competitive advantage for organizations that can make sense of and use the knowledge present in the organization.
Knowledge Transformation	Refers to the transformation of knowledge from tacit to explicit. Arguments are made that instead of attempting to convert knowledge, the focus should be on transforming the way people communicate and interact to better benefit from the tacit knowledge in its current form.
Knowledge Sharing	Knowledge sharing refers to the act of sharing existing knowledge. Can be easily communicated through ICTs.
Knowledge Transfer	Knowledge transfer is the process of transforming and evolving knowledge. There is an understanding that some knowledge transfer is reliant on face-to-face contact as trust and relations is a prerequisite for knowledge transfer, which is best established in person. Some, however, argue that ICTs enable co-presence to be established without co-location and the transfer of knowledge in an online format. Regardless, it is argued that knowledge transfer is reliant on socialization.

Digitalization	Digitalization re-shapes the business model and value creation process. It is important to remember that it is a process that will require time and effort. The Covid-19 pandemic has accelerated the need for digital solutions and shortened the adoption curve.
Information Technology (ICTs)	ICTs enable e-learning and other digital learning techniques and tools to facilitate and encourage organizational learning. Drawing on this view, using ICTs could enable tacit knowledge to be shared without first being transformed to explicit knowledge. ICTs also enable data to be collected, stored, and shared fast and with low cost.
Digital Learning	Digital learning refers to delivering digital media (images and text etc) through the internet and that the learning contents and methods of teaching aim to enhance learning, improve the effectiveness of teaching, and promote the development of personal skills and knowledge.
Digital Tools	Digital tools have already proven to offer benefits such as time and resource allocation, and accessibility. The accessibility of information, however, brings challenges with, for example, information overload which can reduce the openness to digital adaptation
Virtual Reality (VR)	VR is a tool that enables tacit knowledge to be developed through personal experience without physical presence. It potentially allows for safety-issue to be reduced and compensates for aspects lost in traditional training by allowing for training to be done in a virtual environment rather than a physical one.
Augmented Reality (AR)	AR enhances aspects of reality. AR can be applied to several areas, including learning as it leverages visual and auditory elements to the learning experience. One of the benefits that AR brings to the user's learning is the clarity and the fact that it holds the potential to add a different perspective on what is meant to be learnt compared to traditional learning.
Gamification	The concept centers around the idea of adding game-like features to a non-game context. Increases the enjoyment and the clarity of training. support and guidance of the user to achieve the objectives of the tasks that are presented as a means of learning.

Table 1. Chapter overview of the literature review, including key concepts and the concepts content.

3. Methodology

In the following chapter, the research methodology will be outlined. The chosen research strategy, research approach and research design will be presented along with the reasoning behind the decisions made. Moreover, the data collection and analysis process, along with the quality aspects of the research will be elaborated upon.

3.1. Research Strategy

The decision of research strategy must consider several aspects to ensure the suitability and favorability of the chosen strategy (Bell, Bryman & Harley, 2018). These aspects include what research questions the study intends to answer, the purpose it aims to fulfill and use of theory as a guidance. This thesis will apply an exploratory and qualitative research approach. The exploratory approach is often associated with theory generating rather than hypothesis testing (ibid). The choice of an exploratory research approach is based on that similar research topics are not exhaustively explored in existing research. An exploratory research approach can be favorable when there is a lack of extensive research and scarce prior understanding of the research topic (ibid). The subject of this thesis is derived from a literature gap and is rather niched, wherefore it can be argued that the research field is unexplored. This research aims to fill the current literature gap through the development of new insights on the digitalization of learning services accelerated from an external digital shift. This will be done through applying the concept of digital learning and knowledge transfer to a global context. The qualitative data collection conducted by the researchers will extend the understanding of the stated areas of interest. A qualitative research approach is often used for studies of single objectives, i.e. a company (ibid). This further supports the choice of a qualitative approach for this thesis, since the study will be conducted in collaboration with the case company Volvo Buses.

The relationship between research and theory can be explored using either a deductive or an inductive approach (Bell, et al., 2018). The single case company that this study is based on entailed that the researchers were able to obtain an initial overview of the company. Most commonly, qualitative research strategies are complemented by inductive approaches (ibid), which was also the case for this research. The inductive approach allows the researchers to establish a broad understanding from gaining an overview of the studied case (ibid). For this reason, a qualitative study, using an inductive research approach was chosen as the most suitable alternative to study digital learning in a global context. The initial insights obtained from the case company entailed a wide perspective of the subject of digital learning services that was used to structure this research.

3.1.1. Research Philosophy

The research philosophy that researchers choose tends to have a rather strong impact on the study as the very purpose of the philosophy is to guide the researchers through the whole process. Usually, one refers to one of the four common research philosophies, namely; interpretivism, positivism, realism and pragmatism (Bell, et al., 2018). While all research philosophies tend to have their advantages and disadvantages, the one that has been chosen for this study is the interpretivist one. This is, due to the philosophy's very core, being that people differ from one another. This idea is what makes it a suitable one for this study since it puts humans in the center of attention rather than objects. As the research that has been conducted for this research is qualitative and focuses on human experience and understanding, it has a significant advantage over other philosophies (ibid).

3.2. Research Design

For this thesis, a single case study was chosen as the research design best suited. The research design describes the structure or framework used to collect and analyze data in relation to the chosen research method (Bell et al., 2018; Saunders, Lewis & Thornhill, 2009). The purpose and specific research question of a study determine the preferable research design to use. For this reason, the single case study was chosen for this study as it focuses on contributing to a detailed analysis of chosen objectives for a specific case. There will be advantages and disadvantages associated with whichever research design that is chosen to conduct research (Bell et al., 2018). According to Siggelkow (2007), the sample size of a case study is often perceived by researchers as too small. Flyvbjerg (2006), however, argues that case studies generally reflect the real world in a detailed and explicit way. Furthermore, a single case study assists in the researcher's learning process.

3.2.1. Case Study

A case study design provides the opportunity for the researcher to obtain in-depth knowledge of a specific case in its natural environment (Bell et al., 2018; Saunders et al., 2009). In this study, the case company (i.e. Volvo Buses) is in the process of adapting to the sudden digital shift entailed by the Covid-19 pandemic. As a global company conducting training worldwide, Volvo Buses must develop digital substitutes to adjust for the current travel restrictions. The single case study offered an exclusive opportunity to gain insight and knowledge on their internal processes and perception in relation to the new initiative on digital learning services. Volvo Buses have strong incentives to develop digital learning services and offer insights into a global organization undergoing digital transformation. Hence, Volvo Buses is a relevant case for the aim of this thesis and will contribute to the research with practical applications. According to Rowley (2002), a case study is especially preferable for an exclusive case which has something to declare. Volvo Buses is facing a specified challenge and are interested in incorporating an external perspective in their future digital strategy.

For business research, the case is commonly a company and should answer the questions of how and why something happens through application (Bell et al. 2018; Yin, 2011). For this reason, this research design is favorable for this study, which aims to extend the existing literature on digitalization of learning services in a global context, through an in-depth analysis of Volvo Buses. A case design focuses on generating a deep understanding of a specific case, rather than a generalizable view (Bell et al., 2018). Volvo Buses is an interesting and relevant case to study in relation to the accelerated demand for digital solutions as they have a history of being first-movers, indicating a corporate strategy of rapidly adapting to new market prerequisites. Furthermore, Volvo Buses is a global and knowledge-intensive company, which indicates that it is interesting to study how internal knowledge can be used as a competitive advantage through leveraging digital learning services.

3.3. Data Collection

The data in this study was collected in two different steps. Secondary data, such as previous research in the field of interest, was reviewed. This process included the determination of inclusion and exclusion criteria. In relation to this, keywords were identified. The secondary data used for this study is also to some part compiled from internal documents provided by Volvo Buses. Furthermore, primary data was collected. The primary data was collected primarily through interviews conducted with employees at Volvo Buses with relation to the digital learning services.

3.3.1. Secondary Data Collection

The secondary data is pivotal to most studies as it provides the researchers with theory and an understanding of what it is that previous research emphasizes as essential in the field of study (Bell et al., 2018). For this study, the main part of the secondary data was composed from research and literature within the research field. A systematic approach was applied to the literature review, which was the initial phase in the external data collection process. The systematic approach further simplified the identification of existing research gaps. This included the usage of inclusion and exclusion criteria, that were determined in accordance with the thesis' delimitations and with the purpose of differentiating between which secondary data was deemed relevant for this study. Thereby, all secondary data that was used in this study were assessed on the aforementioned criteria. For instance, literature on VR was included since it is one of the key concepts in this study, whereas literature on MR (Mixed Reality) was excluded as it was deemed irrelevant by the researchers. The inclusions and exclusion criteria used for this study is further listed below in Table 2.

<u>Inclusion Criteria</u>	<u>Exclusion Criteria</u>
Literature on VR and AR	Literature discussing digital tools similar or related to VR and AR, yet not a part of them. For instance MR.
Literature on explicit and tacit knowledge, including in relation to those digital concepts that have previously been discussed in this thesis.	Literature on collective and individual knowledge.
Literature on knowledge transformation, sharing and transfer in general and especially in relation to explicit and tacit knowledge	Literature regarding implementation of digital solutions or tools.
Literature on gamification as a concept and usage areas	Literature on change management.
Peer-reviewed articles or secondary sources that have been cited and thereby contributed to peer-reviewed articles (English).	Literature on the business model transformation, or the specific influence of digitalization on the business model or value proposition.
Secondary data sources that were documents provided to the researchers by the case company	Non-English literature.

Table 2. Inclusion and exclusion criterias of the secondary data of this thesis.

The inclusion and exclusion criteria listed in Table 2 was used to guide the researchers in the data collection process. As the data collection was done digitally, the researchers furthermore used several keywords to ensure the relevance of the literary sources for the research's topic. The keywords that were used are; *Explicit knowledge, tacit knowledge, knowledge transfer, knowledge sharing, knowledge transformation, information and communication technologies (ICTs), digital learning, digital tools, gamification, virtual reality (VR), augmented reality (AR)*. Furthermore, set inclusion and exclusion criteria were used to maintain the relevance throughout the process. The literature that was used have all been found using the same means, which stresses that they are all relevant to the same objective (Saunders et al., 2009).

In this study, the researchers collected external literature from several databases. Primarily, the databases Google Scholar, Emerald Insight, Harvard Business Review, Web Of Science, and the University of Gothenburg's exclusive library database were used. A snowball-effect was applied to the selection process, as references in relevant journals were explored further. The researchers made sure to use peer-reviewed and commonly cited articles to the largest possible extent and evaluated the academic sources carefully. Since the Covid-19 pandemic is a relatively new phenomenon, the amount of research that has been conducted regarding organizations is fairly limited. As a consequence, some of the secondary data sources were not peer-reviewed articles. The researchers made sure that those few sources that were not peer-reviewed articles had previously been cited by peer-reviewed articles to ensure that only reliable sources were used. The small part of the secondary data that consists of articles that in themselves were not peer-reviewed, can be argued to still be credible since their content have been cited by peer-reviewed articles. The one exception to this are data compiled from internal documents provided by the case company itself, i.e. Volvo Buses. The internal

documents were used to gain insights into the service training and an overview of the structure of TtT training. These documents expanded the researchers' understanding beyond the scope of what could be accessed through the company's webpage. The secondary data collection was necessary to extend the researchers current understanding of the research topic and the selection was made with the intention of contributing to the introduction, literature review and analysis section of this thesis.

3.3.2. Primary Data Collection

The primary data was collected using a qualitative research method. The data was collected from twelve semi-structured interviews. The twelve interviews were all conducted with employees at Volvo Buses, of which six are internal bus trainers and six are market trainers. The interviews aimed to provide two different perspectives on the TtT sessions at Volvo Buses, which is the process that is currently undergoing digital transformation. In addition, the six market trainers represent different market segments, which allows for the global aspect to be incorporated into the research. For this study, with consideration to the global and multinational company Volvo Buses, insights and perspectives from different markets are favorable to address the challenges and opportunities brought by the digital shift in learning services. As this study aims to incorporate perceptions and insights, a qualitative research strategy is favorable. A qualitative research strategy emphasizes the constant changes to social context and how it is perceived by individuals (Patel & Davidson, 2011). Bell et al. (2018) confirms that a qualitative research method allows more focus to be put on words rather than numbers throughout the process of collecting data.

3.3.2.1. Interviews

A semi-structured approach was chosen for the interviews conducted in this study. The semi-structured approach incorporates the use of both close and open-ended questions. According to Bell et al. (2018), a valuable aspect of this flexible approach is that it allows the researchers to gather comprehensive data from the interviewees. In line with the aim of this thesis, the semi-structured approach was deemed appropriate as it can extend the existing knowledge of digitalization of learning services. In addition, interviews provide the researchers with insights from the interviewees on identified issues or possibilities (ibid), which serves the purpose of this study. The interview guide used for the semi-structured interviews was based on the theoretical framework compiled during the secondary data collection. Two interview guides were created to ensure the questions' relevance to the intended interviewees and their contribution to the research topic. The guides differed slightly depending on whether a market trainer or an internal bus trainer was interviewed (see Appendix A & B). The order of the questions asked differed depending on the provided answers. The semi-structured approach and open-ended questions also entailed that additional questions were asked during the interview to ensure that all relevant topics were exhaustively examined (ibid).

3.3.2.1.1. Sampling

A non-probabilistic sampling approach was applied for this study. Essentially there are two types of sampling procedures, probabilistic and non-probabilistic, and both can be used regardless of whether the research is being conducted qualitatively or quantitatively (Bell et al., 2018). With the non-probabilistic technique the individuals in the sample are chosen based on the subjective judgement of the researchers, meaning that accessibility and availability are the common determinants of an individual's participation in the sample (ibid). This study adopted a non-probabilistic technique since the researchers of it found that it was critical that reliable and legitimate people with experience in relation to what was being researched are required to make out the sample. Additionally, the research was restricted to Volvo Buses and thereby the sample consisted of company employees, meaning that the probabilistic sampling method is disregarded by default. The sample size of the targeted sample group should be comparable to previously conducted studies with similar research purposes to be deemed large enough and add value to the research (Bell et al., 2018). The number of potential respondents was limited as the target group are employees at Volvo Buses, but was still deemed large enough to add value to this thesis. In accordance with previous qualitative research in master theses, the researchers argue that the sample size is sufficient in relation to the scope and content of this study.

The selection process of primary data gathering directly influences the empirical findings wherefore it is essential to consider the relevance of chosen respondents (Bell et al, 2018). Careful selection of interviewees entails fewer biases (ibid). For this study, the selection of the interviews required internal insight from the supervisor at Volvo Buses to be able to gather relevant knowledge and input from employees being affected by the project of digital learning services. Ultimately, twelve interviewees were selected, which were equally distributed between internal bus trainers and market trainers. The internal bus trainers were deemed relevant for this study as they are part of the GST team that is responsible for developing and carrying out the service training. As Volvo Buses is a multinational company with customers and offices all over the world, six market trainers were selected to incorporate the global context in which the digital learning is intended to be carried out. Together, the six market trainers account for all markets in which Volvo Buses currently operates. This includes South America, North America, Europe, Asia, Africa, and Oceania. Combined, the internal bus trainers and market trainers offered two perspectives on the learning services at Volvo Buses. This was valuable for this thesis as the aim is to investigate the opportunities and challenges with digital learning services, and how Volvo Buses can leverage digital solutions. Leveraging digital solutions will require market acceptance and adaptability to market differences. The interviews were conducted in late February and Mars 2021. In Table 3, more details of each interview is shown.

Before the study was conducted on the entire target group, a pilot study was carried out to increase the chance that the questions and formulations were comprehensible and were not easily misinterpreted, as well as that the research fills its intended purpose (Bell et al., 2018).

Conducting a pilot study enhances the quality and design and assures that the study contributes to the research question being answered. For the pilot study, two respondents were asked to participate in an interview, after which they were asked to provide the researchers with feedback and thoughts on the content and execution of the interview. As the feedback ultimately did not change the interview guide or structure of the interviews, the pilot interviews were included in the sample. Naturally, this could have posed an issue in regards to the consistency of the study and the quality of the answers that were given during the interviews. However, as the interviews that followed the pilot studies were conducted in accordance with the pilot interviews and no changes were made to the interview guide, the results of the pilot interviews were not deemed to differ significantly from the interviews that followed.

<u>Interviewee</u>	<u>Date of interview</u>	<u>Interview Format</u>	<u>Interview duration</u>
Internal Bus Trainer 1	22nd of February 2021	Virtual Meeting	41:06
Internal Bus Trainer 2	23rd of February 2021	Virtual Meeting	42:37
Internal Bus Trainer 3	8th of Mars 2021	Virtual Meeting	46:22
Internal Bus Trainer 4	8th of Mars 2021	Virtual Meeting	54:38
Internal Bus Trainer 5	19th of Mars 2021	Virtual Meeting	50:24
Internal Bus Trainer 6	22nd of Mars 2021	Virtual Meeting	53:48
Market Trainer 1	2nd of Mars 2021	Virtual Meeting	47:54
Market Trainer 2	3rd of Mars 2021	Virtual Meeting	50:40
Market Trainer 3	3rd of Mars 2021	Virtual Meeting	46:30
Market Trainer 4	5th of Mars 2021	Virtual Meeting	1:06:41
Market Trainer 5	16th of Mars 2021	Virtual Meeting	50:13
Market Trainer 6	26th of Mars 2021	Virtual Meeting	48:43

Table 3. Summary of the interviews. Who was interviewed, how and for how long and when they were interviewed.

In Table 3, the researchers bring forward more details of each interview. While the table indicates that all interviews were conducted virtually, it further indicates that the interviews differed in time as well as date. Lastly, the duration and date of each interview is shown in accordance with which interviewee participated in the interview.

3.3.2.1.2. Interview Process

To obtain as much valuable data as possible, it was essential to establish a relationship with the interviewees. Therefore, the interviews were initiated by asking the interviewees about themselves and letting them tell their own stories. Then, the interviewees were asked questions in regard to the research topic and their perception of Volvo Buses current internal and market acceptance for digital solutions. It is important to consider that the interviewees' answers are framed by personal opinions and perceptions. In relation to this, language differences must be considered. The primary language of the interviewees differs as Volvo is a multinational company with a representation of different nationalities throughout the company. With the intention of increasing the transparency between the interviewer and the interviewee, the interviews were consistently conducted in English. English is not the native language nor used daily by several of the respondents. However, all interviewees communicate in English as part of their work, wherefore it was assumed that most potential misunderstandings could be avoided. The researchers therefore chose to consistently conduct the interviews in English.

The settings for all interviews were consistent to ensure reliability (Bell et al., 2018). The disparity between the interviews were reduced from the participation of both researchers in all interviews. After assuring that the interviewees gave their approval, all the interviews were recorded. The interviews were recorded using the app Otter. The app differentiates between voices, which means that it can separate the participants from one another. The researchers double checked the transcripts to ensure that there were no misinterpretations made. With consideration to ethical aspects, the interviewees were asked for approval both before the recording started, and then again on record. The recordings were exclusively used for transcripts. Additionally, to increase transparency even further and make the interviewee feel comfortable, they were allowed to remain anonymous throughout the whole research process. All interviews were conducted using the digital tool Microsoft Teams as this is the established meeting channel at the case company. The decision to use virtual meetings is based on the geographical limitations, but also the restrictions of the ongoing Covid-19 pandemic. Bell et al., (2018) mention phone interviews as an alternative to conducting interviews face-to-face. The interviewees in this study were located in different markets and countries, entailing that virtual meetings were deemed the most appropriate form. Virtual meetings allowed the researchers to obtain more reliable findings through the opportunity to interpret body language and facial expression, which would not be possible through phone interviews (ibid).

3.4. Data Analysis

Analysis of the collected data is of fundamental importance for all research (Bell et al., 2018). All research studies contain an analysis in which the researchers make sense of the data that has been gathered by finding patterns and deriving themes from it. Using a structured analysis method is essential to create a framework in which the data, results, and findings can

be analyzed. Additionally, the structure of the data analysis process influences the research's validity. The primary data will be analyzed in relation to the collected secondary data. Academic materials on, for example, implementation, digital learning, and company information will be used to make sense of and interpret the findings from the conducted studies.

While quantitative studies tend to focus on relations between variables and measure the phenomenon of the world, qualitative research strives towards finding a deeper understanding of the field of study by analyzing the data that has usually been collected through interviews and text. There are mainly two ways of analyzing data qualitatively, either through thematic analysis or grounded theory analysis (Bell et al., 2018). The former centers around the idea that through coding of the data, usually through transcripts, the researcher attempts to find themes that are common in the data sources. The latter however, does not necessarily concern the analysis, but the whole research process as it uses an iterative approach where data collection and analysis happens simultaneously (Glaser, 1999). This study used a thematic analysis due to the method's flexibility of analyzing the commonness and differences in large data sets (Bell et al., 2018).

Eisenhardt (1989), argues that the analysis of the data in qualitative case studies should be done by comparing and contrasting the second-degree codes that are found in order to derive themes. More specifically, Eisenhardt (1989) presents a process consisting of eight steps to build theory from a case study. The first three steps refer to the preparation of the study. The steps include; getting started, selecting cases, and crafting instruments and protocols. Essentially, these steps serve to ensure that the research question is defined, the appropriate case is selected and the data collection method chosen. Then, after the data is gathered in the subsequent step, the data should be analyzed within and across the different cases. The analysis then contributes to the creation of hypotheses which are compared to existing literature before a conclusion is reached based on the similarities or contradictions between the existing literature and the case study. This process corresponds to the process used by the researchers of this study. Coding qualitative research data entails a risk that social context is overlooked (Bell et al., 2018). As an example, if the researchers interpret a statement without consideration to the context. To minimize this risk, the researchers recorded the meetings and discussed each finding to ensure credibility and to reduce the risk of misinterpretations.

3.4.1. Process of Deriving Codes and Themes

As has been previously discussed in this thesis, the data for the research was collected through twelve interviews with twelve different interviewees and then analyzed through a thematic analysis. From the data, a total of 493 data codes were found. This was done by printing out the transcripts from the interviews which were then thoroughly read by the researchers. Continuously, notes were made at each point in the transcript where the interviewee was interpreted as having pointed to something of value or importance and from there a code was found. It is, however, pivotal to address the fact that there are different types of importance or value. For instance, an interviewee stating their name is of great value in

regard to transparency and knowing who it is that is actually being interviewed, and ensuring that the data comes from someone who can be ensured to be employed by Volvo Buses. With that in mind, that data would not be interpreted as contributing to the research regarding actual empirical findings that adds to the field of study.

With such a vast number of codes, the researcher finds that the data is deemed as rich, which greatly contributes to ensuring that the themes that have been identified are true and actual themes. After having identified the codes, the analysis of the data proceeded towards finding second degree themes (See Appendix C). In this part of the analysis process, the codes were reviewed repeatedly to ensure that the second-degree codes that were identified were indeed correct. This meant that the codes began to group and ultimately had been gathered into six groups that are the themes in this study and were named based on what the researchers, after discussions, had found was the best suitable label for each theme. The process of deriving themes from the data is further illustrated below in Figure 5. The themes identified are: *Collaboration, Information Online, Practical Learning, Market Differences, and Adopting Digitalization* (See Figure 7).

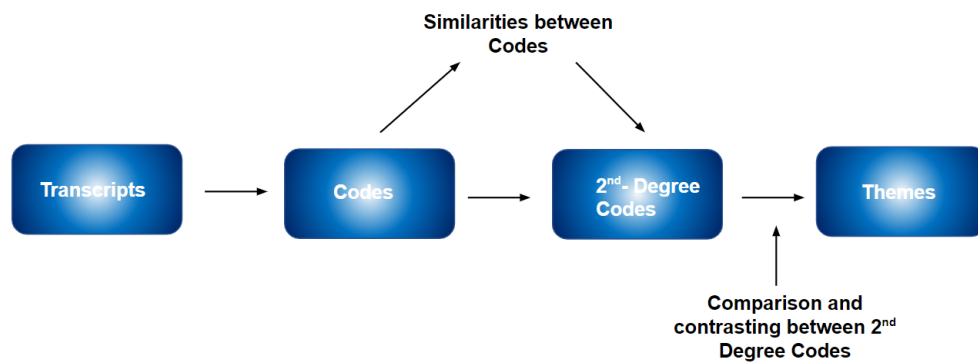


Figure 5. Summarized process of thematic analysis.

In Figure 5, the researchers illustrate the aforementioned process of deriving the study’s themes. It is a summary of the analysis process and points to the first stage of transcribing the interviews that served as the research primary data. From there on, codes were derived and through an iterative process the researchers were able to develop second degree codes from which themes were evolved. The illustration is an adaptation from Brunnström, (2020).

3.5. Quality of Research

The quality of this research has been briefly mentioned throughout the methodology section. For quantitative research, the research aims are well-established as validity, reliability, generalizability and objectivity (Tracy, 2010). However, qualitative research is associated with a large variety of quality indicators (ibid). Commonly, there are four criterias argued to determine the quality of a qualitative study, namely dependability, credibility, confirmability, and transferability (Saunders et al., 2009), which should also be discussed. Dependability

refers to the process of documentation during the research procedures. This allows for people outside of the study to follow its process and grasp the extent to which the research is reliable. In this research, this was primarily done by recording the interviews that were conducted, as well as writing transcripts of them, which gives the reader of the research the possibility to go through the interviews and ensure that what is being proposed to have been said actually was said. Additionally, transcripts are also useful to the researcher. The fact is that by having access to transcripts from the interviews, the researcher is to a much greater extent able to go through them and analyze the answers. Moreover, by transcribing the interviews more objectivity is granted to the study as the findings then are less likely to be the result of the researchers' biased remembering of the interviews (Saunders et al., 2009).

To ensure greater authenticity in the research and especially so in terms of transcripts and results, the interviews in this study were recorded using an app called Otter. The benefit of the app is that it differentiates between voices, which means in its transcribing record it understands that different people were a part of the interview. Thereby, more authentic and literary transcripts can be produced. In terms of credibility, it is commonly referred to as the extent to which the findings are believed to be true. This research study used a classic approach to this called triangulation, which means that multiple data sources were used to test whether the data is true. If only one source out of ten makes a statement, then that means that the credibility will be low and vice versa (Saunders et al., 2009).

Confirmability is another essential part of ensuring the quality of qualitative research and it is the extent to which other researchers can confirm the findings of the focal research. This is rooted in that the data has not been interpreted to mean anything different from what it actually means. Hence, the most effective way of doing so is to keep a continuous process of documentation of what happens and is being noted by the researchers throughout the research process. The reason why is that it allows for others to assure themselves that the researcher was not being biased and did not attempt to get the type of results they hoped for, but instead that the results are unbiased. The researchers in this study both documented and reviewed the material both separately and together to reduce the risk of personal biases permeating the research. Transferability is the last of the four criteria. It is based upon giving the reader of the research the insights to the context, situation, and environment in which the research was conducted. The most established manner of doing so is usually to thoroughly describe the context in which the research was carried out, as it allows for other researchers to then determine the degree to which they are able to transfer the context to their research context (Saunders et al., 2009).

Although the above-mentioned criterias are commonly used determinants of quality for qualitative research, Tracy (2010) argues that more standardized criteria would add value to the complex landscape of qualitative research. Hence, eight "Big-Tent" criteria are promoted as alternative criteria. These criteria include 'worthy topic' which refer to that the topic should be relevant, timely, and interesting. Furthermore, 'rich rigor' is mentioned as a criteria, which accounts for the appropriate use of context, data and sample. Since this study was conducted with the aim of contributing to the research gap on the effect of an accelerated

digital transformation, entailed by the Covid-19 pandemic, of learning services for a global company, it can be deemed relevant and timely. This is in line with Tracy's (2010) reasoning that current political climates can contribute to research. Further, studying the case of the global company Volvo Buses, which was undergoing a digital transformation of their learning services, through a qualitative study consisting of employees active in the researched field can be deemed appropriate in terms of context, data and sample. This has been previously elaborated on and justified (see sections 3.2.1 and 3.3.2.1.1.).

Tracy (2010) also incorporates the criteria 'sincerity' and 'credibility'. Sincerity refers to the researchers' self-reflection on biases and transparency about the methods. The researchers have accounted for potential biases throughout the research. As an example, both researchers were involved in the data analysis and all findings were discussed before they were defined. The researchers would further argue that transparency has been achieved as the method choices have been presented and justified in previous sections. Credibility addresses whether extensive descriptions and details are presented. Tracy's (2010) definition of credibility resembles the definition of the term provided by Saunders et al. (2009). In terms of credibility, the researchers have provided different perspectives on the topic. Both a cultural, social and individual perspective has been presented. Furthermore, the conclusions are derived from multiple sources of data. The fifth criteria mentioned is 'resonance' which incorporates the study's effect on an audience, and whether the audience can relate to the discussed topic. The researchers argue that this study achieves resonance as most people are affected by and can relate to digitalization and digital learning.

The final three criteria presented by Tracy (2010) are 'significant contribution', 'ethical' and 'meaningful coherence'. One of the aspects covered by significant contribution is whether the research has heuristic significance, meaning if the research will be acted on in the future (ibid). Not only will this study be used as a basis for the case company's future digital strategy, it also provides novel contributions that can be explored in other settings. The ethical aspects of this study was considered throughout the research and is elaborated in the below section (see 3.5.1.) The final component, meaningful coherence, refers to whether the study achieved the stated purpose and interconnected literature with the findings compiled from appropriately used research methods (ibid). The researchers argue that the study achieved the purpose of the study and that chosen methods were carefully considered in relation to the study's purpose. Findings have been interconnected with existing literature and contributed to fulfill the aim of this study.

3.5.1. Ethical Considerations

Consideration of potential ethical issues are prominent when conducting research (Bell et al., 2018). Diener and Crandall (1978) mention harm of participants, invasion of privacy, prevention of deception and lack of informed consent as the primary ethical principles to consider for business research. However, harm of participants include aspects such as stress (ibid), wherefore the researchers made sure to specify that the interviews were voluntary and that the interviews could be ended at any time if the interviewee felt pressured or

uncomfortable. The interviews were scheduled with consideration to the interviewees' schedules and time zones. Further, the researchers were flexible with rescheduling of the interviews if requested by the interviewee. Moreover, Bell et al., (2018) emphasizes the importance of handling recordings with care to prevent harm of the participants. Both recordings and transcripts were kept on the researchers' password protected computers to ensure that it could not be accessed by anyone but the researchers. In addition, the material was deleted and shredded after the analysis was completed.

Prior to the start of the interview, the interviewees were informed that only basic roles would be used in the thesis and that their participation was anonymous throughout the process. The researchers must consider the potential identification of individuals or organizations in qualitative research to ensure anonymity and confidentiality (Bell et al., 2018). Privacy of the interviewees was also ensured through that the interviewee was informed of the possibility to end the interview at any time. To ensure that the interviewees were given the prerequisites to make an informed decision, the researchers provided information about the purpose of the research and the interviews, as well as how the collected data would be handled. This also increased the transparency and served to prevent deception and the lack of informed consent (Bell et al., 2018).

4. Empirical Findings

This chapter contains the empirical findings of this research, including the derived themes, the process of how those themes were derived and citations that illustrate examples of the themes. The empirical findings were found through interviews that were conducted with Internal Bus Trainers and Market Trainers at Volvo Buses.

4.1. Introduction of Themes

Six different themes were derived from the thematic analysis; *Collaboration, Information Online, Practical Learning, Learning in Online Format, Market Differences, and Adopting Digitalization*. In this section, the themes will be elaborated and discussed in relation to the interviews conducted. The themes derived correspond to elements that affect the digitalization of learning services at Volvo Buses. In Figure 6 below, the relationship between the different themes are demonstrated further. It can be seen that it was found that market differences influence all the other elements. Volvo buses operate in a global context which entails that the findings will to some extent be market dependent.

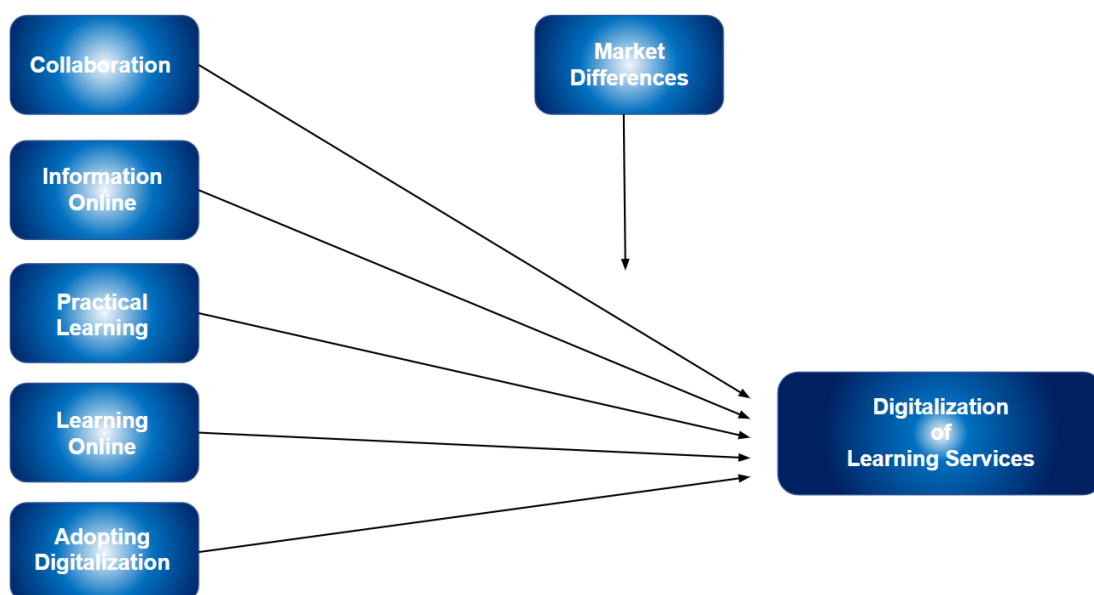


Figure 6. Illustration of the relation between the derived themes.

In Figure 6, the researchers illustrate that five of the six themes are directly impacting digitalization of learning services at Volvo Buses, whereas one of them, market differences, does so indirectly. As Volvo Buses is a global company, the market differences are present at all times and influences how the other five themes contribute to the company's learning services.

4.2. Collaboration

The shift towards more digitalization has promoted mutual learning and collaboration. The new prerequisites require new solutions, and there is no predetermined solution. Many of the internal bus trainers experience that internal cooperation and mutual learning have been promoted by the challenges with reformatting the learning services. The internal bus trainers mention that they have shared possible solutions and ideas with each other to a greater extent and that it is valuable and interesting to learn from other trainers. In addition, they mention that there is little pride within the team and that it is common to compare materials and ask for second opinions from colleagues. Despite the perceived increase in internal cooperation, several of the internal bus trainers still mention that they believe it would be beneficial to further gain insight into how their colleagues structure and conduct their TtT sessions.

Generally, the trainers appear united in the experience that both the internal and external collaboration could be developed. Yet, there are disagreements as to how valuable further collaboration would be. Some trainers argue that it would only be beneficial to the extent that their work coincides and the insight could be directly applied to their own work. Other trainers argue that collaboration can provide new insights that can be applied if it is modified to fit their own needs. A majority of the trainers express a wish for further collaboration at least between the market trainers and internal bus trainers. Some of the market trainers express that they are hesitant to contact the internal bus trainers due to the perception that the internal bus trainers have limited resources and time. In turn, the internal bus trainers mention that it would be valuable to get more input and insights from the market trainers on potential solutions. Several of the trainers discussed a potential global network or platform accessible by all employees at Volvo to broaden perspectives. Today, there is no global network (or the trainers do not know it exists) intended to promote collaboration and discussion. The trainers argue that technology, such as forums, should be utilized to promote interaction and involvement. Internal Bus Trainer 3 specifically emphasizes the opportunity of creating loyalty to Volvo as a brand from creating passion and making people “geeks”. Some trainers also mention the potential value of a network for technicians outside of Volvo.

A majority of the market trainers are very pleased with the TtT presented by the internal bus trainers and would argue that they are impressed with the many features they incorporate in the training. However, some of the market trainers raised concerns about the adaptability of the material and tools presented by the internal bus trainers. Not only are there differences in available resources and infrastructure in different markets, but also, the market trainers experience that they can not fully utilize the TtT as it is not adapted to the prerequisites present when they are conducting the training themselves. Market Trainer 6 pointed to the difficulty of conducting quality training of the same standard with technicians when TtT has been done with superior facilities and resources:

The purpose of a TtT is for, for all the trainers around the region to have the right training in order to be able to support the regions. Okay, so when we go to, let's say Gothenburg for a TtT, and they have everything, they have the tools, they have the engines on stand, you have the training rigs, you've got everything you need. (...) And we do not have those facilities that Gothenburg had, then we cannot deliver the same quality of training as what was delivered in Gothenburg.

- Market Trainer 6

The market trainers highlight the difficulty of matching the quality of the TtT due to the mismatch in resources and also as the internal bus trainers collaborate in the creation of materials whereas the market trainers work more alone. This problem appears to be recurring even in the digital format. Even though the market trainer in question argues that physical instruments are more difficult to replicate, there are still limitations to the utility of digital solutions. Not only are there limitations from access to computers or the internet, but also budgetary restrictions. It is difficult for the market trainers to provide the same experience as they got from the TtT.

4.3. Information Online

Most of the trainers agree that the largest benefit of the shift towards more digital training services is that the material is stored in an online format and easily accessed. For a multinational and worldwide company such as Volvo, this reduces issues such as, for example, adapting to different time zones. Providing materials digitally also entails the opportunity of greater personalization as the user can access specifically requested materials at a time of their choosing. Internal Bus Trainer 2 summarized it as:

Give me only as much as I need at the time and place that I decide. Meaning, it got to be really personalized to me.

- Internal Bus Trainer 2

Not all trainers have the same use for all materials, wherefore they argue that it would be of value to make sure that the relevance to the user is considered in the distribution of information and materials. Several market trainers mention the need to be able to either share the material with external parties or that external parties can access the material themselves. In many markets, the customers or dealers can not access relevant information, making it difficult to assure that the standard set by Volvo is maintained. Storing the material online further entails the possibility to distribute the information and that it can be reviewed multiple times. However, many of the trainers problematized the ease of distribution and online storage. A potential disadvantage is that online storage offers a greater amount of materials and information to be stored. Internal Bus Trainer 1 specifically expressed concern for information overload and described the problem as:

So sometimes you can't see the forest for the tree. So we probably have the information out there on how to explain it, but is it simple? Is it a one page document that gives people enough information to be self sufficient?

- Internal Bus Trainer 1

Too much information slows down the process of obtaining relevant information. Internal Bus Trainer 1 continued to emphasize the importance of good navigation tools to avoid the problems with information overload. In addition to Internal Bus Trainer 1, some other trainers discussed preferred ways of navigating large documents and mentioned the value of search functions. Great demand was expressed for gathering all relevant information in the same place or on the same platform to ensure that information is not overlooked. It was also mentioned that the information in documents should be divided such that searching for a concept or a word offers the opportunity to read all relevant information about that topic. According to Market Trainer 2, it is however still important to provide all information as you might find information that you did not know you were looking for at first:

The digitalization provides you speed of answer. So, you tend not to overwork because you're taking the blinkers on like a horse and be really focused on what you want. Sometimes you do have to take a step back and look at a broader view so that's when your mind starts to read more stuff in general.

- Market Trainer 2

The information access should not be limited based on assumptions made on the information's relevance since that can entail that important aspects are overlooked. It is further brought up by some of the trainers, that an increase in online material also entails a greater need for technical support. As an example, Internal Bus Trainer 5 mentioned giving up and moving on after not understanding an e-learning. Furthermore, it was brought up that it is unclear for trainers how to sign up to e-learning and TtT sessions. According to Market Trainer 6, there have also been cases where it has been clear that material has been outdated:

I mean it's one thing to adopt digitalization, but something to keep in mind is the fact that when you do adopt digitalization, you need to ensure that your resources are current and up to date. And there is somebody looking after it, because there have been instances where there are like online assessments online courses, where you can clearly see that the information is out of date, or inaccurate, but there is nobody responsible to amend these, these oversights.

- Market Trainer 6

It is vital to ensure that the material is continuously updated, accurate and easily understood. When information, whether in e-learning or materials, are not up to date or difficult to understand, it discourages the trainer and creates a disbelief.

4.4. Practical Learning

All of the trainers mentioned that one of the biggest challenges - or *the* biggest challenge according to some - with digital learning services is the inability to incorporate physical touch and practical exercises in a digital format. They argue that the practical parts of the training are vital for the understanding of certain topics of the training. Market Trainer 5 explained that from reading and hearing something one learns 20%, whereas to learn 100% one will need to combine reading, hearing, understanding, and touching. A majority of the trainers are confident that conducting theoretical training online can be adapted for the purpose and fulfill the needs, but the practical training can not be successfully conducted online yet. Digital tools such as VR are argued by some trainers to be a potential solution, but other trainers are certain that the practical training can not be replicated in a digital format. Market Trainer 2 exemplified the importance of practicality as:

I mean you can teach someone how something works. And they could all go away with levels of knowledge because they have different learning styles and different levels of remembering and different ways of remembering. But you need to complement that with diagnostics as a compliment by going through a few practical examples, because for some that's when it becomes ultimately clear.

- Market Trainer 2

Practical aspects are argued to be valuable as it offers an additional learning technique that is easier for some to comprehend. The main arguments in opposition to conducting practical training are safety related. To be a certified trainer, you must demonstrate both your theoretical and practical knowledge. The trainers opposing practical training online argue that the practical knowledge can not be certified in other ways than face-to-face. Internal Bus Trainer argue that some aspects of the training, such as safety aspects, are not satisfied through digital means:

So, at least for now I believe there are certain paths, especially safety related - both electric and high pressure - and also some things which are regulation bound, which we cannot make digital and and we are happy to retain those in the form that we have today.

- Internal Bus Trainer 2

Some of the trainers' optimism towards a fully digital learning process is limited. However, the trainers that are more optimistic towards potential digital solutions are confident that it will be possible to have built-in safety errors that will test the practical knowledge using, for example, VR technology.

4.5. Learning in Online Format

Conducting TtT-sessions online has given rise to certain concerns for the trainers. According to the trainers, one of the major challenges with conducting online training is the lack of face-to-face interaction. Face-to-face interaction enables the trainers to conduct practical exercises which many of the trainers argue is a key component in the learning process. According to some of the trainers, the practical elements make it possible to draw on the students' previous knowledge and experience based on recognition. The training is supposed to give the student enough competence to know where to start if there is a problem. However, several of the trainers highlight the general difficulty of explaining purpose, symptoms, and relation - to teach *why*, not only *how* - through digital learning services. According to Internal Bus Trainer 6, market trainers might struggle to follow the explanations in TtT sessions:

Symptoms and relation, and where the signal is going. This is a big challenge, always for trainers. And, looks like they understand, but it's really difficult for them to really follow our explanation.

- Internal Bus Trainer 6

It is challenging for the internal bus trainers to ensure that the explanations given will generate a deeper understanding of the relation between all components and symptoms. Meeting the students face-to-face gives the trainer the possibility to interact with the students, and they can actively study their body language and notice signs, giving an indication of whether the students understand the content or not. Market Trainer 6 highlighted the inability to address the training participants attention level as a key issue in online training:

Similarly, if the energy level of the class is very low, it's easier to notice because you can scan around the class and see the attention level and things like this, but if you are doing an online training, your focus is kind of fixed, either you have a camera with the participants, and if they are in the remote locations then it's even harder because maybe you see only one out of, maybe six or seven.

- Market Trainer 6

The trainers all share the understanding that there is less active participation in the training being conducted online due to more distractions, making it challenging to maintain the attention of the learner. As a result of the inadequate participation, the internal bus trainers also experience that there are fewer questions from the students. A potential reason brought

up by one Internal Bus Trainer 4 is that there might be many unconscious questions that can be interpreted by a trainer on-site from the students' behavior, which can not be picked up online. For this reason, a number of the trainers mention that they are missing a simple tool where the students can ask questions anonymously. Anonymity enables the students to ask questions - either to the entire class or in private - without fear of failure. The internal bus trainers are trying to find solutions to adjust for the lack of face-to-face interaction and ensure more active participation. According to Internal Bus Trainer 2, it is essential that communication arises from both parties:

Most of our tools have to be interactive. It cannot be a one sided approach or a monologue. It has to be in dialogue. So, interactive digital tools I believe will make it more understandable and the retention is possible as well.

- Internal Bus Trainer 2

Interaction is highlighted by the trainers as a key component in a successful learning process. A majority of the trainers agree that variation and involvement promote learning, wherefore the trainers must try to incorporate elements that generate active participation. Internal Bus Trainer 4 mentions a technique called the '60/40- technique', meaning 60% of the training is theoretical, and 40% requires active participation (such as exercises, quizzes, or questions). Incorporating exercises, taking small breaks, and using smaller discussion groups are examples of techniques commonly promoted and used by the trainers. Exercises of different kinds are greatly promoted by many of the trainers as it is a way of 'learning by doing', and as it is greatly appreciated by the participants. Based on the trainers' own experiences, they remember workshops and activities best wherefore they aim to incorporate elements like that in their training. Internal Bus Trainer 1 pointed to the necessity of incorporating practice shortly after the participants have been presented with theory:

First you present some theory, then they have to practice immediately in one way or another. Then they also get active. To go from the half sleeping mode into the activation mode.

- Internal Bus Trainer 1

Not only do the trainers agree that it is important to involve and activate the students during the training, through for example exercises, but it is also important to have the student in focus when designing the training. Understanding the students and their needs are vital for the retention of the training. Many of the trainers mentioned that the key to successful training is that the students have fun and feel relaxed so they are open to the learning process. The aspects of enjoyment is clear in in terms of lowering the threshold for learning, as argued by Market Trainer 2:

I think it's very important for the people to feel relaxed and also to have fun at every point along the way, if, if people are watching, and have a little bit of fun. They generally break down barriers. They're not so worried and they tend to learn a bit more, they tend to remember so if you make it a bit more fun, change it up a bit.

- Market Trainer 2

The understanding that enjoyment increases learning and breaks down barriers to learning is further supported by Internal Bus Trainer 5 who argues that if the learning is fun, then you forget that you are learning. Some of the trainers mention the initiative to incorporate game-like features and competitions in the training to motivate the students. Internal Bus Trainer 3 however points out the importance of being careful not to infantilize the training so it becomes too childish. Incorporated in the view that the student should be in focus is the understanding that all people learn in different ways. People also have different preferences when it comes to obtaining information, especially between generations and cultures. Some of the market trainers mentioned that whether they give out hand-outs or digitally stored material is dependent on the audience. Some students prefer written materials, whereas many people are not used to reading long texts anymore. Some students prefer listening to the trainer talk, and some students prefer learning by images and visualizing. A majority of the trainers mention visual tools - such as images, illustrations, graphics, animations, etc. - as a key component in the learning process. The trainers argue that visual tools are very helpful for clarification and to gain understanding quickly, which is highlighted by Market Trainer 3:

So, always when you can use a picture or semantic view or explanation that's of course more than useful and videos of course.

- Market Trainer 3

Internal Bus Trainer 3 continues in the same line of reasoning as Market Trainer 3, that visual elements are useful to explain something. Internal Bus Trainer connects it to the modern day society as a contributor to a shift in obtaining information:

I would focus, definitely on the visual side, I mean the society is constantly going is directed more and more visually. We like short and easy to grasp content, a lot of visuals, a lot of new stuff, you know the dopamine shots, all the time.

- Internal Bus Trainer 3

In a society where people are continuously and increasingly exposed to visuals, it has entailed new preferred ways of learning. Several of the trainers also mention that having videos and recordings from the TtT available for distribution and review would be very helpful both for the students, but also the trainers as it provides an easy means of clarification. The trainer does not need to repeat themselves, but the student can watch it as many times as they wish.

Animations also allow the trainers to visualize components from inside that can not be seen from the outside. It was brought up by several of the trainers that it could be beneficial to find inspiration from or utilize YouTube as many trainers and technicians use it as a support tool. Market Trainer 4 also mentioned that it could be valuable to offer instructional videos to key customers to enhance Volvo's reputation and gain loyalty. Overall, visual aids are one of the most recurring requests from the trainers and the attitude towards visual elements in training is very positive. There was however a smaller concern raised as to the importance of ensuring that the visual elements are clear and simple, or else they will not fulfill their purpose.

Ensuring that the materials are well prepared and complete is of great importance for the trainers. Several of the trainers highlighted that knowledge and experience establish trust. The trainer must know the subject matter and their intended audience to establish trust from the student. Market Trainer 2 mentioned that if there is a lack of trust in the trainer, it is likely that the student will find the information on their own or ask someone else they trust, which undermines the value of the training.

4.6. Market Differences

Cultural stigmas and cultural differences are mentioned by all the trainers as a highly relevant factor in their training and the shift towards digital training. As an example, Internal Bus Trainer 4 mentioned that in some markets the training can start immediately, whereas in some markets it is required to spend some time socializing before the training starts - all depending on the cultural context. Several of the market trainers mention the importance of understanding that cultural differences entail challenges and that they will demand different approaches. Market Trainer 2 especially points to stigmas around failure as an obstacle in ensuring that people understand what is being taught:

From the point of view of technology, it's very difficult to teach new technology because most people are scared. And they've got a fear of failure, and a fear of embarrassment, especially in different countries where there's a cultural stigma around failure or cultural stigma around asking questions because you might perceive to be not understanding what a person is teaching.

- Market Trainer 2

Trainers must consider cultural stigmas in their choice of teaching techniques, and develop an understanding of underlying differences that influence the learning process. Operating in many different markets entails different prerequisites. For market trainers, adapting the training material to each market is one of the biggest and most time-consuming challenges they face in their everyday work. As there are different resources and infrastructure in each market, the market needs vary accordingly. A majority of the market trainers mention the difficulty of ensuring quality with limited resources and the difference in demand. A product that is considered old in advanced markets can be considered new in developing markets. As

the training material is not continuously updated, it is rarely up to date when a developing market is first introduced to it. According to Internal Bus Trainer 2, understanding that needs differ between markets is essential:

One size does not fit all. A market that needs digital training very badly today might not be the same case with another market. As with also the market trainers and technicians.

- Internal Bus Trainer 2

The demand for digital training differs between individuals and markets, which must be considered in the shaping and design of digital learning. In connection to the ongoing digitalization of digital learning services, digital resources present one of the biggest barriers in the markets. Many market trainers mention the lack of stable internet connection or WiFi access, further complicating the market trainers' work. Even if the market trainers are provided with digital solutions to support the training, it is not useful if the student does not have internet access, as is exemplified by Market Trainer 6:

It's more a question of whether the country or the workshop, or the company can support that kind of resource with stable internet connection, or at least Wi Fi access and things like that (...) there are workshops I've been to where there is no WiFi, whether it's restricted or it's just not there.

- Market Trainer 6

Access to stable internet connection and WiFi is a prominent challenge to consider in the digitalization of learning services. Another major concern for the market trainers is the language barriers. One of the concerns mentioned is that the market trainers do not always understand English very well, wherefore it is a challenge to understand the TtT. In order for the market trainers to then be able to adjust the training material to fit the intended market, they must first ensure that they understand it themselves (despite often not having English as their first - or even second - language) and then translate it to the language of the students. The market trainers that do not have English as their primary language mention that they can sometimes translate the material themselves, and sometimes they use a local translator or hire an external translator. Even if the market trainers can translate the material themselves, it is a very time-consuming process that accounts for a large part of their work hours. Some of the market trainers therefore specifically promote the utilization of local staff and local resources, as well as to further use inside sources of language skills and technical skills. Additionally, Internal Bus Trainer 1 expresses that it would be of much use to have, for example, videos with pre-prepared subtitles that can be distributed between market trainers.

4.7. Adopting Digitalization

Almost all trainers find it difficult to imagine that the practical parts of the training can be conducted digitally and still fulfill the same need. Yet, there is a common understanding that the current situation has created a need for accelerating the digitalization process of the training. Market Trainer 6 argues for the necessity of physical training aspects and that without it, the training is incomplete:

I know a lot of people who are very old school in that they would like to touch and feel and I fully agree with them because I mean without the touch and feel factor the training is incomplete, but it's better to be incomplete than to have no training at all. So, I mean for the current situation this is where we are and it's definitely giving a big push to digitalization.

- Market Trainer 6

Despite the technological push from the ongoing Covid-19 pandemic, there is a resistance towards change from trainers in terms of re-shaping the learning process. Some trainers argue that the resistance to change is a general phenomenon, and not only connected to the forced changes of the pandemic. One trainer mentions that culture is the most difficult thing to change since people generally do not like change. Even though the trainers agree that digital solutions are helpful during the pandemic, many of them hope that this will only be a temporary solution since the digital format is not currently fulfilling the training criteria. Internal Bus Trainer 6 means that no advantages for the participants can be seen from using digital learning services. Other trainers argue that it is important to utilize the developments of digital solutions even if it would be possible to “go back to normal” after the pandemic, as the progress of digital solutions brings great opportunities for the company in the longer run.

The trainers that have a positive view of the shift towards more developed digital learning services believe that constant change is good and that the future is in digitalization. For the shift to be successful, there must be an ‘all in’ mentality and strive for technology acceptance. A majority of the trainers share the understanding that Volvo as a company is forward-looking and a company that wants to be ahead of its competitors. To stay ahead of the game, they must continue to be the first mover and invest in sustainable solutions such as digital learning services. A large number of the internal bus trainers feel motivated and eager to continue to improve the digital TtT and are confident that there are good tools available that can fill the current gaps in the learning objectives. Some of the trainers express that they believe there will be a hybrid solution after the Covid-19 pandemic, where all theoretical aspects will be online in combination with some practical exercises on-site.

The trainers make an important distinction between using new solutions because they are available, and using them because they *add value* to the aftermarket. Before implementing any new solutions, it is important to create a need and ensure that the users understand the benefit of it. Internal Bus Trainer 2 argues that change can not be pushed, there must be a market pull:

I think as with any change. The important aspect is the need should be there. That means, it should not be a push. It should be a pull as well.

- Internal Bus Trainer 2

Internal Bus Trainer 3 argues similarly to Internal Bus Trainer 2, that solutions should be chosen based on the value for the user. but elaborates on the push of new tools on the market:

Only then we think of what we want to achieve, and then we choose the tool, and it's not, we find the tool and then how we can possibly use that to feed our schedule (...) The approach is like that, oh, we have a brand new tool. Let's see how we can fit that theme to our schedule, it should be a different way around.

- Internal Bus Trainer 3

Generally, both the internal bus trainers and market trainers experience resistance when it comes to accepting and implementing new solutions. There is a resistance in habits as many of the trainers have many years of experience in the field and have habitual ways of conducting their work. Furthermore, there is a 'what's in it for me'- approach when it comes to changing the individual's methods. There is also a fear of new technology, making it challenging to teach using new technological solutions. Many trainers mention that the reason why they experience that themselves and people around them are hesitant towards new solutions or changes is that they have not seen or understood the need for it. In addition, the cost perspective influences the attitude towards digital tools as potential solutions, increasing the need to prove that the benefits outweigh the costs. Convincing the user of the benefits and added value of a new digital tool or solutions can be challenging due to the skepticism towards the unknown. Internal Bus Trainer 3 raises the issue that ensuring proof of added value is essential in introducing new technologies:

So, I know that introducing new technology can be confusing, or even scary to people. So if I were to introduce something new, I would have to have really like strong points that would speak behind it. I would have to be sure that I can convince the market trainers that guys you will need to invest some time in, in learning that method, but since you learned that method, you'll be off with, with something really great and functionality, and that will benefit you a lot. And unless I am sure of that, I wouldn't like to force it upon anybody else.

- Internal Bus Trainer 3

To generate acceptance for new digital solutions, trainers must prove its function and benefits. It is further explained by some of the trainers that it is important to remember that trainers (and technicians) generally are used to logical reasoning, wherefore that is the best way to motivate them to implement new ways of working. Another reason for the resistance was mentioned by several market trainers, and that is the market differences. In several markets, the resources available in the markets are insufficient to support the new solutions. Different markets have different prerequisites which complicates the use of the same methods and solutions in all markets, which is exemplified by Market Trainer 6:

Normally they are resistant to accepting new ways of doing things. I mean, especially in Asia, where technology is not something widely found. You could have workshops which don't have Wi Fi, for example, or countries where the WiFi is unstable. And so if you're relying on content that's online to download, that may not be favorable to the customers.

- Market Trainer 6

Even if value added from digital solutions can be proven, the markets may not have the sufficient resources to utilize the new solutions. In general, the trainers agree that the shift towards digital learning solutions will take time and requires investments in training. Some trainers argue that it will take some time before the technology is mature enough to fulfill the learning objectives, whereas other trainers mention that it is a positive thing that the technology is not mature enough yet since it offers the opportunity of influencing the development of new digital solutions that will fit their own needs. A few of the trainers argue that the available resources and equipment today are sufficient to provide quality learning over long distances. And, all trainers agree that there is development potential in future digital solutions for Volvo Buses. Frequently mentioned digital solutions are apps, gamification, and adapting current internal platforms to smartphones, which is exemplified by Internal Bus Trainer 2:

One thing that is not currently being explored enough, and that's what I believe, is gamification of the training done something that I strongly believe I like playing games myself. And by the way, learn. So why not do such a thing with our folks.

- Internal Bus Trainer 2

The trainers promote the incorporation of gamification and existing apps into the learning process. It is a new situation for all the trainers and their students, meaning that experience and skills must be developed simultaneously to the development of digital solutions. Most of the internal bus trainers think that their biggest challenge is the combination of new tools and new technology, which requires that they learn both new tools and technology themselves, and teach others in parallel. As an example of this Internal Bus Trainer 4 states:

A lot of people have knocked the door of GST and say, What can I do? How I should conduct training online, we don't know how to do it? We have found the training is not fruitful training. So they realize that it's missing something. So this is maybe the big challenge for us also to standardize and to help people how to teach, but we need to also learn by ourselves.

- Internal Bus Trainer 4

While there is a demand for new digital solutions, there is also a demand for support and guidance in relation to existing ones. Many of the market trainers as well as the internal bus trainers address how a more standardized offering would be beneficial to uphold the quality and consistency of the training. The trainers experience that there is no general guideline and all trainers conduct their training the way they see fit, resulting in a difference in quality. They argue that quality can be assured through standardized ways of teaching. Internal Bus Trainer 3 also mentioned that standardization is beneficial from an economic standpoint as it cuts warranty costs and the costs of consistent service. Furthermore, the trainers mention that more standardized material might be needed since online materials (such as videos and presentations) are more complex to adjust in relation to the previous materials which can be easily customized. Many of the trainers also wish to ensure quality from collecting more feedback and follow-up by the students to ensure knowledge over time.

A majority of the trainers mentioned that one of the biggest positives of the digital learning format is the time saved in the long run. Not only do the trainers save time from traveling less, but they also need less preparation time. An additional benefit from less traveling is the cost reductions. The re-allocation and utilization of resources are also mentioned by some trainers as a cost benefit. Several of the trainers mentioned that face-to-face training requires a significantly longer time to prepare than digital training. As argued below by Internal Bus Trainer 2, bringing training on-demand decreases the time spent on preparation and an increase in efficiency:

However, the advantage has been that we've been able to give training on demand. And that is something that I really believe that digital training will bring about that be training on demand. And as much as training on demand. It also means a lot less pressure on me as a trainer. If I were to do a face to face training it probably requires about a week if not 10 days of preparation, but with a session like this if I'm teaching you maybe about two days.

- Internal Bus Trainer 2

Preparation time and accessibility are two of the key benefits discussed by the trainers. Providing training online also saves time as the student can access the materials and repeat them without the trainer having to be present or available. Neither the trainers nor the students are locked into a specific time frame and the training can be brought up on-demand

and at a self-pace. Further adding value is that digitalization enables connection at speed and it can redefine the learning time as the material can be accessed both faster and easier.

5. Analysis

This chapter contains the analysis of the empirical findings in relation to the literature review that was presented in an earlier chapter. The analysis provides insights into how the derived themes stand in comparison to previous research and ultimately, where the needs of Volvo Buses aftermarket service match with the aforementioned digital solutions.

5.1. Collaboration

Preceding research argues that employee knowledge serves as a pivotal part of a firm's competitive advantage (Howells, 1996). Consequently, internal knowledge sharing has become critical for companies to proceed to grow and increase their competitiveness. The empirical findings in this study show that there is improvement potential in knowledge sharing among employees. Ipe (2003) argues that to be able to capitalize on knowledge within an organization, it is of great value to understand how knowledge is created, shared, and used. The empirical findings of this study indicate that the technological shift has entailed the need to find new ways to create and share knowledge within the organization. According to Hvorecký et al. (2015), the ability to share knowledge differs depending on whether it is tacit or explicit knowledge that is intended to be shared. Explicit knowledge is easily shared between individuals, whereas tacit knowledge is more difficult to share as it is embedded in and dependent on the experiences and perceptions of individuals. Bock et al. (2005) argue that it is tougher for individual knowledge to become organizational knowledge without social interaction and a social context. It was found from the empirical data that an especially challenging aspect of knowledge sharing in a digital form is the sharing of tacit knowledge that was previously shared through face-to-face interaction and practical exercises. From this, it can be said that the empirical findings in this study support the previous research on sharing tacit knowledge online.

According to Howells (1996), tacit knowledge is vital to organizational learning, wherefore it is of great importance for the trainers at Volvo to find and implement new solutions that enable tacit knowledge to be shared between individuals in a digital environment. Smith (2001) argues that worker-centric environments where sharing of knowledge is encouraged promote knowledge sharing in an organization. It is further argued that it is valuable to understand and utilize knowledge present in an organization. Several of the trainers interviewed mention the potential benefits of establishing a network, either on a global scale or at least on a regional scale. It was however clear from the empirical data that not all trainers were convinced that a shared network or platform would be valuable as they believe the knowledge and experience may differ too much to be of any help. Choi et al. (2010) address that shared knowledge must be applied to improve team performance. Drawing on this reasoning, it can be argued that if the knowledge shared between employees at Volvo can not be applied, it will not improve performance. Therefore, it might be more valuable for the trainers at Volvo to begin with improving the collaboration between teams working with similar tasks. According to the empirical findings, the internal bus trainers that were interviewed already work in a team where they exchange knowledge and ideas, whereas the

market trainers express the wish for further collaboration between trainers as they tend to work alone. Choi et al. (2010) argue that knowledge sharing between team members ensures high productivity levels for both the team itself, but also the organization in general.

The market trainers mention time and resources as two main limitations in their everyday work which, according to Choi et al. (2010), this could potentially be solved by increased collaboration. Hildrum (2009) mentions the influence of individuals' motivation to obtain new knowledge through online means as a deciding factor with knowledge sharing. Furthermore, Hildrum (2009) argues that the involvement in networks of practice online can promote the individuals' motivation. It is apparent from the interviews that the trainers are doubtful of the added value from a global network, indicating a lack of motivation to obtain new knowledge online. However, Hildrum (2009) further reasons that it is a prerequisite for successful knowledge sharing that the individuals possess relevant technical knowledge, which is easiest to create in more local communities. It can be assumed that the trainers possess somewhat technical knowledge of relevant topics, but what is instead brought forward in the interviews is the differences in the students' knowledge, meaning that the trainers must adapt their teaching to the intended audience. In extension, the differences in prerequisites for different trainers – especially market trainers – arguably entail that insight and knowledge sharing between them might not be as valuable. While market differences may play a part in the willingness to share and receive new knowledge, the empirical findings indicate that there is an overall belief that an increase in internal knowledge sharing could be improved. There are, however, some disagreements as to how knowledge is best shared within the organization - on a global, regional or local scale.

5.2. Information Online

Smith (2001) mentions that the usefulness of information is determined by the selection and transformation of information to knowledge. Lundvall and Johnson (1994) argue that knowledge that can be categorized as 'know-what' and 'know-why' can be incorporated into a database and hence easily stored online. These types of knowledge can be defined as facts and scientific knowledge, which in this case study can be compared to the trainers' training material. The training material contains all relevant facts about design and function. As understood from the interviews, the trainers are attempting to incorporate and teach socially embedded knowledge, which is categorized by Lundvall and Johnson (1994) as 'know-who' and 'know-how', into their digital training as well. These types of knowledge involve skills and social relations, which is argued by many of the trainers to be the most challenging aspect of knowledge transfer. However, according to Stenmark (2000), the use of systems and intranet documents allows for internal knowledge sharing without having to transform tacit knowledge into explicit knowledge. From this, it can be argued that it would be possible for the trainers to express tacit knowledge in a form that can be included in information technology and thereby share professional knowledge within the organization.

Hildrum (2009) also mentions the opportunity in using ICTs to successfully transfer tacit knowledge among technicians on a global scale using advanced e-learning systems. ICTs enable images, videos and text to be collected, stored, and shared by cheap and fast means. A majority of the trainers interviewed for this study promote the use of images and videos in the training, wherefore it appears that the findings support the previous research. However, Lundvall and Johnson (1994) explain that this knowledge is difficult to translate and communicate as it is dependent on the social and cultural context. Regardless of whether the knowledge is tacit or explicit, it is dependent on context. To effectively receive and share knowledge, language barriers must be overcome. The empirical data suggests that the language barrier is one of the biggest concerns for many of the market trainers as they struggle to understand and use the English language. Market trainers spend a lot of time understanding and translating the training material to and from other languages, creating a barrier for knowledge transfer and, in extension, the inefficiency of information sharing online.

The empirical data in this study highlights the benefits that digitalization brings in terms of information and knowledge sharing, collection, and storage. Gathering and storing information at the same place and doing so online, is not only cheap but enables an increase in accessibility for the people concerned. However, as information becomes easier to share and distribute, there is a risk of distributing materials without considering the relevance to the recipient. As is argued by Hildrum (2009), it is essential that the individuals receiving the information possess relevant knowledge regarding the focal topic to be able to understand and use the information. The people involved in Volvo Buses aftermarket training can be assumed to have the relevant technical knowledge to utilize the distributed training materials, but with that said, all information might still not be relevant to each trainer. This is important to avoid information overload, and to ensure that it is easy for trainers to identify relevant and important information. A major issue with information overload is that it discourages people (Bawden & Robinson, 2009).

In addition, Rutkowski and Saunders (2010) state that people with experience of information overload demonstrate less openness to new digital solutions. From the empirical findings, there are indications that some trainers are worried that information overload will become a problem if all information is stored on the same platform, wherefore it is of great importance to ensure that solutions that can help the individual navigate and separate the information are set up and continuously maintained. In addition to the importance of easy navigation, it was also mentioned by some of the trainers that the increased use of e-learning and digital storage entail the need for further IT support. Choi et al. (2010) argue that IT support positively influences knowledge sharing and knowledge application in an organization, wherefore it is vital for Volvo to continuously update the IT support as the digital solutions continue to develop.

5.3. Practical Learning

Howells (1996) argues that while some knowledge and information can easily be transferred and shared through digital means, some knowledge can not. Tacit knowledge, for example, knowledge related to practical exercises, is stressed to be much more important to be transferred in a physical environment. The empirical findings argue similarly and point to the importance of ‘touch-and-feel’ to fully understand how something works. Previous literature provides two main perspectives on the relationship between tacit and explicit knowledge, where it is either argued that tacit knowledge can not be transformed into explicit knowledge, or that knowledge can portray the characteristics of both tacit and explicit knowledge depending on the context (Jasimuddin et al., 2005). The empirical data from this study points to the lack of practical learning as one of the main challenges with digital learning. The trainers experience that digital means are insufficient to imitate the benefits of ‘touch-and-feel’. In relation to the two theoretical perspectives, the empirical data indicates that the tacit knowledge present in the training can not be transformed into explicit data that can easily be communicated – or the context does not alter the characteristics of the knowledge.

Many of the trainers experience that face-to-face interaction and physical touch is a pivotal aspect of the training for them to be able to share their knowledge and experiences. Previously conducted research argues that tacit knowledge arises in action and that face-to-face communication and interaction serve as a pivotal part in the process of transferring knowledge that is tacit or can be categorized as know-who and know-how (Lundvall & Johnson, 1994). This stresses the importance for organizations to at least to some extent have knowledge transferring sessions conducted in a physical environment, which is further stressed as tacit knowledge is difficult to capture, store and share. Roberts (2000) argues that face-to-face contact or demonstration is vital to ensure successful tacit knowledge transfer as tacit elements can exclusively be transferred in such a way. This is in accordance with the empirical data in this research, as many of the trainers argue that the practical elements are invaluable and irreplaceable.

The trainers point to, for example, knowledge transfer regarding safety issues as being especially difficult. Arguments were made that it is only by physically seeing what the knowledge recipient does that a trainer can assure that the person does not act or practice in a manner that causes any sort of danger. The empirical data, therefore, indicate that Polanyi’s (1967) conventional objective that not all knowledge can be articulated is still relevant despite the digital progress. Polanyi (1967) argues that the students learn from observations of behavior and action, which is very much supported by the empirical data of this study. The empirical data points to benefits with a physical presence in knowledge transfer, namely that it is easier to know whether a person understands what they are being taught if the knowledge transfer occurs in face-to-face settings. The trainers repeatedly highlight the difficulty of teaching without being able to interact directly with the student as they can not observe body language or facial expressions or demonstrate practical aspects of the training satisfactorily. The main argument is that by observing reactions and the level of energy and interest from

another person, it is easier to compensate for aspects such as language barriers or questions not being asked.

The findings from this study are in line with previous research, more specifically the statement that one of the key disadvantages connected to e-learning is the absence of face-to-face interaction (Özdemir, 2008). According to Yi (2006), a potential means of sharing tacit knowledge digitally is through sharing personal experiences, indicating that creating and promoting discussion in the training sessions could be a solution to some of the shortcomings of tacit knowledge sharing online. Although, it can be argued that solutions such as VR would generate more value in terms of practical learning. VR would enable the trainer to demonstrate and observe practical exercises in a simulated reality.

In other Volvo departments, VR is already used for some parts of the training with satisfactory results. VR solutions enable the student to interact safely in an environment, lowering the barriers of learning, such as fear of failure (Liagkou et al., 2019). The safety aspect in relation to certification of trainers is a major concern and barrier brought forward by some of the trainers at Volvo which must of course be addressed before using VR to certify trainers. However, other departments at Volvo have already certified trainers through the use of VR, wherefore it can be argued that the technology will be sufficient to attend to the safety related needs in the near future. Another main barrier for companies when implementing VR is that it carries high initial costs (Numfu et al., 2019), but as there is already adapted software available within Volvo, the additional investment would be relatively low as only hardware is needed. The current software available covers basic aspects of the technical training, enabling it to be tested before potentially investing in the development of more advanced software.

5.4. Learning in Online Format

The main teaching techniques promoted by the trainers are to incorporate exercises and to ensure variation in the training to maintain involvement and active participation from the students. The empirical data demonstrates that social interaction is a key component in knowledge sharing and knowledge transfer, which is consistent with previous research which argues that interaction, discussion, and socialization is necessary to ensure that knowledge is shared, understood, and transferred between individuals (Özdemir, 2008; Tsoukas, 2005; Zack, 1999; Nonaka & Takeuchi, 1995). It is important to ensure that social aspects are embedded into the learning experience, as it allows for a mutual learning experience that expands the learner's knowledge through creative processes and activities (Nonaka & Takeuchi, 1995). Tsoukas (2005) argues that tacit knowledge emerges in actions and social interactions. Moreover, Hvorecký et al., (2015) discuss the four stages of learning to combine the creation of explicit and tacit knowledge.

The empirical findings somewhat overlap with these stages. The trainers promote interaction and communication between students and the trainer, which can be argued to fit in the concept of the socialization stage. Furthermore, in the externalization stage, the student is supposed to demonstrate their knowledge which can be recognized in the trainers' attempts to

incorporate exercises and activities where the student gets to test their knowledge. Based on the empirical data, it is difficult to identify whether the two remaining stages - the combination stage, and the internalization stage - are covered by the training. Drawing on the reasoning of Hvorecký et al. (2015), the lack of combination and internalization would entail that the learning is ineffective. The lack of these two stages in the training could be a potential explanation as to why the trainers experience the digital learning as insufficient to transfer all relevant knowledge, assuming that the combination and internalization are not present in the training, which the empirical findings do not foretell.

Boisot (1998) points to ICTs' ability to maintain co-presence without co-location in terms of learning. However, the empirical findings in this study show that training through ICTs has resulted in less active participation and questions, and especially the internal bus trainers report an inability to interact with their students. As an example, in multiple of the interviews, the trainers discussed the benefits of implementing a system where the students can ask questions anonymously. Even though digital means can in theory promote interaction from a large scale of people, there is a trade-off in the more impersonal and less qualitative learning experience (VanderArk & Schneider, 2012). There are, however, indications that the digital learning process can increase the individuals' active participation if available tools, such as tablets and smartphones, are leveraged (Hunter, 2015). Leveraging smartphones allows for greater communication and promotes interaction between the students. From the empirical study, it was found that several of the market trainers have identified a need from technicians to make the available training materials and digital tools compatible with mobile devices as computers (and especially computers with internet access) are less frequently used than smartphones in some markets. This shows that there are indications that it would be valuable to incorporate the use of smartphones in the digital learning offering as it is likely to increase the students' participation and interaction. Furthermore, many of the trainers argue that there is a demand for an increase in visual elements that clarifies and illustrates the education materials. Many of the trainers mentioned that they value visual aids in training and that it increases understanding.

Another aspect that must be considered for digital learning is the adaptation with concern to the students. Different backgrounds and interests entail different preferences and abilities to obtain and retain knowledge (Irfan & Shaikh, 2008). The empirical data indicates that ensuring that the training puts the student in focus allows for a more active learning experience and, hence, that more knowledge is obtained. The trainers mention that people get bored easily and that the retention value is believed to be lower during parts of the training in which interaction is low. Hamari et al. (2014) argue that enjoyment and socialization serve as an increase of knowledge transfer, mainly due to its lowering of the threshold to obtain information. The data of this study and preceding research are in accordance with one another in this regard as the empirical findings indicate that the use of breaks, socialization, variation, and enjoyment are positively contributing to the knowledge transfer. By implementing aspects of the training that people appreciate, people are more open to new information and increase concentration according to the data. However, the empirical findings also point to digital training being negatively contributing to these specific aspects as less socialization and

distraction arise due to digital methods decreasing the trainer's ability to interact directly when necessary. Including gamification in the learning experience is an example of a method that contributes to increasing enjoyment and socialization which positively influences digital knowledge transfer.

Gamification has been argued to have some sort of positive effect on learning, although the degree of the positive effect differs depending on for instance visuals or auditory aspects (Hamari et al., 2014). Gamification can have a positive effect on attitude, motivation, and enjoyment of learning. The degree of the effect is however dependent on the visuals being used, the auditory, and the users' characteristics. This means that to ensure that gamification is an effective aid in learning, it must be adapted to the intended students. Gamification can be implemented in a simple and standardized format, or create an individual user-centered experience (Klock et al., 2019). In order to test the effects of gamification on the intended users - the market trainers and technicians - it could be beneficial to utilize simple gamification at first. When evaluating the effectiveness of gamification it is, however, important to consider that all people are unique, wherefore all individuals will not appreciate it as a learning technique. From the empirical data, it is apparent that the teaching techniques used by the trainers differ depending on the students. Key aspects in the adaptation are social and cultural differences, indicating that there would also be a need for adaptation of gamification solutions. As simple and standardized gamification does not offer much personalization, it could be valuable for Volvo to invest in user-centered gamification once it has been proven that gamification could add value to the digital learning services.

A pivotal aspect to ensure the quality of the training that the empirical data points to is trust and preparation, with the argument that by being prepared and providing high quality material, the trainer is able to positively influence the training recipients' trust in him or her, ultimately contributing to a more effective knowledge transfer. According to preceding research, trust serves as an essential part of knowledge transfer and without it, it would be immensely difficult to gain new knowledge (Roberts, 2000). However, Roberts (2000) points to the social context's importance in trust, meaning that the means of training conduction being influential on trust. It is argued that a face-to-face context is the most positive manner of increasing trust in terms of training, as it is far easier to balance out any potential cultural differences that could decrease trust. The empirical data highlights the importance of using well-prepared materials and knowing the subject to generate trust from the students. It is expressed, especially by the market trainers, that if they are not confident in the internal bus trainers' expertise and subject knowledge, they will turn elsewhere for answers or find answers themselves.

Finally, VanderArk and Schneider (2012) argue that there are three main areas in which digital means can increase learning. The first one is personalized skills, which is also mentioned by the empirical data to be a benefit of digital learning. However, a distinction must be made between the possibility to adapt e-learning and the training sessions conducted by the trainers. The trainers mention that it is more difficult for them to see the individual in the digital training sessions, hindering them in identifying the individuals' needs or concerns.

The other area mentioned by VanderArk and Schneider (2012) is tools for increasing collaboration. From the interviews, it was found that easy tools that promote collaboration or interaction were not widely used by the trainers, presenting future opportunities to utilize cheap and easy means to improve the training. Finally, digital means it makes it easier to store data and information at a single access point. The empirical data indicates that there is a lot of uncertainty as to where information can be found, and demand to gather all the relevant data in the same place. Therefore, there is development potential for storage of online material and information at Volvo Buses.

5.5. Market Differences

Volvo Buses is a multinational company that operates in numerous markets where the preconditions differ in terms of resources and infrastructure. This entails a challenge for the trainer to adapt to the different market conditions and expectations. The empirical data suggest that the preconditions affect the possibility to implement digital solutions into the training. For instance, in order to access material digitally and through a common platform, one needs access to the internet and stable wi-fi. However, as indicated by the empirical findings in this research, not all markets that Volvo Buses operate in have access to the internet to the point that would be necessary to fully implement digital solutions into the company's operations. The trainers must also adapt to the different social and cultural aspects in different markets. As an example, it has been argued by the respondents in this study's data set, some can start the training sessions immediately, whereas others must initiate the training by socializing. Lundvall and Johnson (1994) argue that social and cultural context have an impact on the communication of knowledge, specifically regarding the knowledge that could be categorized as know-who and know-how. Additionally, foreign languages and technical terms play an essential part in the ability to share and transfer knowledge. The data in this study makes similar indications in the material on occasion being in a different language than the recipients of the knowledge speak with fluency and is one of the factors that influence a slower progression of transferring knowledge. Another factor that has an impact on the recipient's ability to obtain knowledge is that the translations are not necessarily done properly.

Additionally, Jiacheng et al. (2010) argue that different cultures are motivated to engage in knowledge sharing for different reasons. Some cultures share knowledge with the end purpose of ensuring that all individuals in the group have the same knowledge and thereby that the relationships within the group are built on equal terms. Other cultures are engaging in sharing of knowledge for individual purposes and appear to be less likely to share knowledge at all as it has an impact on the individual's ability to accomplish a given goal and thereby, influences the individual's perception of self-worth. According to the empirical findings, similar patterns have been found where indications of differences in approaches to learning must be made dependent on cultural context. This could serve as a barrier to knowledge sharing on a multinational scale. Another prerequisite for tacit knowledge transfer is to establish mutual trust which, according to Roberts (2000), is dependent on the social and cultural context. As Volvo Buses operate cross-border, it is important to acknowledge that the

level of trust differs depending on the culture and country to facilitate knowledge sharing and knowledge transfer between markets. This is especially important due to the lack of face-to-face interaction that could reduce the difficulties with communication (Boutellier et al., 1998). The empirical findings suggest that the language differences are a major challenge, especially for market trainers, since it is difficult to ensure that the students understand the training. It should, however, be mentioned that online training sessions facilitate a greater cultural exchange as the individuals must not be physically present. According to (Özdemir, 2008), an increase in social and cultural exchange also increases knowledge transfer as a new social context will emerge and create trust.

5.6. Adopting Digitalization

A shift towards implementing any sort of digital tools into the organization means that the organization and the people working in it will have to change (Parviainen et al., 2017). As firms have failed to successfully ensure a shift towards digital solutions in the past because of not being able to make people open to new solutions. In terms of the Volvo Buses aftermarket training, the empirical findings in this research point to similar arguments. While there is a clear openness and common understanding that a digital shift is required to remain competitive in the future, there is also an understanding that it does not happen overnight. The empirical data shows that the company at large has a positive view of digital means, but that it is essential to leverage it so it generates a beneficial outcome. As Parviainen et al. (2017) argue, there will be a process during which the organization sees proof of a positive outcome through a shift, but adoption time will still be present. The empirical data in this study points to the very same, that the change will happen over time as the organization and the people within it can embrace and learn to work with the new tools.

The empirical findings indicate that there is a need to create a market pull to be able to present new initiatives or solutions. According to the empirical data, it is essential that changes and implementation of digital tools into an organization and its operations are done with the sole purpose of adding value and not for the sake of digitalizing. It was pointed out that leveraging a smaller and easier digital solution could be a valuable solution instead of attempting to implement a more advanced and costly technology that would change the operations drastically. Coeckelbergh (2020) argues that the Covid-19 pandemic has entailed an acceptance of the need for digital solutions, indicating that it will be easier to establish a market demand. Given that the empirical findings point to a general understanding that digital solutions are necessary, there is an indication that Volvo Buses' acceptance for digital means coincides with the overall market acceptance for digital means as a result of Covid-19.

Even though there appears to be a common understanding that there is a current need for digital learning services, the empirical data presents somewhat different visions of the future. Some trainers argue that the digital shift is a great opportunity, and that digitalization represents the future in learning services. Other trainers consider digital learning to be a temporary solution until it is possible to conduct training on-site again after the pandemic. A positive attitude is the main accelerator of effective knowledge sharing behaviors (Bock &

Kim, 2002). It is important to create an organizational climate and subjective norms that encourage knowledge sharing to motivate and inspire individuals to share their knowledge (Brock et al., 2005). According to Hau et al. (2013), social aspects, such as individual motivations and social capital, influence knowledge sharing. Parallels can be drawn to similar reasoning found from the empirical data. Many of the trainers mention the need to understand the value created from new solutions or initiatives before it is embraced and supported. This indicates that without proof of individual benefits, there is less motivation for the trainers to share knowledge.

There are several ways in which a digital tool can add value to an organization. Some of the major benefits of conducting the training digitally that the trainers have identified and discussed in the interviews are that it is time-saving, and reduces costs. Overall, digital tools seem to offer economic value. While there may be a higher initial cost in investing in the development or procurement of suitable tools, it is argued that over time the costs are likely to be lower. In addition, the costs of traveling, materials, and accommodation are reduced. The trainers also specifically mention that the preparation time, travel time, and time spent teaching are reduced if performing digital training. More time can be allocated into for instance material preparation instead of traveling time. These aspects are also supported by the literature. For example, Sousa et al. (2017), argue that the teaching quality is increased due to the allocation of time and resources. Furthermore, digital learning makes it possible for information, operations, and activities to be accessed and participated in regardless of time zones or geographical location and allows for a more personalized approach to, in this case, training.

6. Conclusions

In this final chapter of this thesis, the conclusions that have been drawn from the analysis in relation to the study's research questions are presented. This includes which recommendations that the researchers would give to Volvo Buses, along with the study's limitations, and suggestions for future research.

This thesis aimed to research the accelerated digitalization of learning services in a global context. The thesis further aimed to research how a multinational company can leverage digital solutions to add value for their aftermarket. To fulfill this aim, the research was conducted in collaboration with the global bus manufacturing company Volvo Buses. More specifically, this study focused on the case company's global service training in relation to the digital shift entailed by the Covid-19 pandemic. For Volvo Buses, the digital shift has accelerated the digitalization of service training. The purpose of this thesis was thereby to expand existing literature by offering a single case perspective on the challenges and opportunities connected to digitalization of learning services. To achieve this, previous research on knowledge and digitalization in relation to the learning process was reviewed. Moreover, the theoretical framework included the discussion of digital solutions, including gamification, virtual reality (VR), augmented reality (AR) and e-learning. Empirical findings were derived from a qualitative data collection process consisting of twelve interviews. From the empirical findings, six themes were derived by using a thematic analysis. The identified themes were; *Collaboration, Information Online, Practical Learning, Learning in Online Format, Market Differences* and *Adopting Digitalization*. The themes were then discussed in relation to the theoretical framework. Based on this, the researchers will draw conclusions and address the study's research questions. The theoretical contribution of this study is to fill the gap regarding how global companies adapt to an accelerated digitalization of learning services, which was done through the single case study of Volvo Buses. Therefore, specific recommendations will be provided to the case company, which is the practical contribution of this thesis.

6.1. Addressing Research Question 1

The first research question stated in this study is: *What are the main opportunities and challenges with the shift towards digital learning services at Volvo Buses?*

From the empirical findings, it can be derived that the opportunities and challenges for Volvo Buses with digital learning services can be addressed in relation to six different perspectives. The overarching themes within which the opportunities and challenges are discussed are: *Collaboration, Information Online, Practical Learning, Learning in Online Format, Market Differences* and *Adopting Digitalization*. The discussion of each theme provides both challenges and opportunities which are often intertwined. It is, however, apparent from the analysis that what is currently perceived as challenges could potentially be converted into future opportunities if adaptations of the learning services are made. One of the major

challenges for Volvo is to ensure that involved parties understand the need for digital improvements. The restrictions on travel due to Covid-19 pandemic has enabled this process significantly as it has entailed a need for digital solutions to conduct global service training. Further, the travel restrictions enable time and resources to be re-allocated into, for example, updating materials. While there is a clear and common understanding that digitalization is the future and that moving in the digital direction is a necessity, there is still a need to demonstrate the opportunities it brings. People tend to be unwilling to change, which is why it is essential to provide proof of why the change is beneficial in the long run. For Volvo Buses, digital solutions entails the opportunity of providing sustainable solutions, which is in line with their overall strategy.

Learning in an online format challenges the trainers in their ability to understand the participants and address concerns that are not articulated. Moreover, the number of questions being raised are lower in a digital format. Digital training complicates the observation of reactions and the energy of the participants that could compensate for barriers related to language or unwillingness to ask questions. This differs between cultures since there are cultural stigmas related to asking questions, which indicates that cultural differences and cultural context influence the participation level. Therefore, the participants' motivations to engage in knowledge sharing differ depending on the individuals and their perceptions. It is not only the individual's willingness to engage that influences whether knowledge can be shared or not, but also language barriers that must be overcome. As language barriers are one of the major challenges that market trainers face, sharing knowledge becomes more difficult as the training material is in English. Market trainers spend much time understanding and translating the provided material. In extension, this creates an obstacle in knowledge transfer and makes information and knowledge sharing online far less effective.

There is, however, a common belief that ICTs and digital solutions can enable more effective knowledge sharing globally. In addition, increased collaboration between market trainers offer the opportunity of more effective preparation and translation of material. The empirical findings suggest that the current internal collaboration among and between internal bus trainers and market trainers is inadequate. The trainers have limited insights into their colleagues' work and the sharing of knowledge and ideas are, for the most parts, missing. It was argued by the trainers that an increase in internal collaboration would add value and increase the quality of the service training. The lack of internal collaboration presents a challenge today, but as knowledge sharing and transfer increase an organization's competitiveness, it also presents a future opportunity for Volvo Buses that employees demand increased collaboration on a local or regional scale.

A major challenge for Volvo Buses is to ensure that the learning objectives are met by the new digital learning services. Both previous research and the empirical findings of this study agree that tacit knowledge is more challenging to transfer online. Some even argue that tacit knowledge cannot be successfully transferred in other ways than face-to-face and in a physical environment, or that some tacit knowledge cannot be transferred at all. This is due to the inherent nature of tacit knowledge - that it is inarticulable. For the trainers at Volvo, the

main challenge with digital learning appears to be the lack of touch-and-feel. They argue that it is necessary to feel the material and components to be able to practically apply the knowledge. The lack of practical knowledge is argued to decrease the up-time and thereby quality of the aftermarket service. The necessity to transfer tacit knowledge in a physical face-to-face context is not only related to the understanding of components and material, but also safety aspects. If not present, the trainer is unable to hinder or correct a training participant if that person acts in an unsafe manner that could pose a safety threat to him or herself as well as others. However, there are strong indications that VR software can incorporate safety aspects and provide a supplement for practical learning face-to-face. Instead, the participants can interact and engage in a virtual environment which is comparable to the on-site learning process with the distinction that the components are virtual instead of physical. Hence, VR presents future opportunities for Volvo Buses to compensate for the lack of practical learning in digital learning services.

Trust serves as an essential part of establishing a relationship between the trainer and the technicians which enables a high-quality training experience. The quality of the material and subject knowledge are presented as key aspects in developing trust and enabling effective knowledge transfer. Another central part of creating trust is the social and cultural context. It is a challenge for the trainers to adapt to the different social and cultural context present in different markets. Digital solutions and online storage of information entail that material can be provided on-demand and easily accessed. For trainers, the accessibility of information enables material to be distributed more easily. However, there are indications that there is an uncertainty as to where relevant information can be found. As is always the case when it comes to online information, there is a risk of information overload, which stresses the importance of only distributing relevant information and providing tools that enable navigating through the information.

6.2. Addressing Research Question 2

The second research question stated in this study is: *How can Volvo Buses leverage digital solutions to add value to the aftermarket learning service?*

From the first research question, there are indications that some challenges that Volvo Buses face with their digital learning services can be seen as opportunities if the company manages to leverage available digital solutions to create value for the trainers. While there is a clear and common understanding that digitalization is necessary during the Covid-19 pandemic, there is still a need to prove that digitalization could add value from a long term perspective. As discussed in relation to the first research question, the major challenges for Volvo is to ensure that digital solutions and tools address the challenges with digital learning, such as lack of physical presence and transferring knowledge without face-to-face interaction.

The empirical findings of this study indicates that there is less active participation in service training online. Therefore, the trainers emphasize the importance of engaging the participants in the training and ensuring that they stay active during the sessions. By implementing

elements to the training that encourage interaction and active participation, it is likely that more knowledge and information are successfully transferred. From the literature review and empirical data, it has been found that enjoyment and variation serve as pivotal parts in digital knowledge transfers as it lowers the threshold for obtaining information. While previous research argues that ICTs can maintain co-presence, the case company has not yet been able to leverage ICTs in facilitating the participants' engagement in a digital format. However, this could potentially be countered by leveraging methods such as gamification. Gamification is one of the primary methods through which distractions can be hindered, and socialization and interaction can increase active participation. While gamification comes in more and less complicated manners, the concept's ability to leverage enjoyment and interaction does generate some sort of positive effect. Gamification further ranges from standardized to user-centered, wherefore it can be used for different purposes.

The empirical data and previous research are aligned in the conviction that visual elements add value to the learning process. Visual elements, such as videos, animations, illustrations and images, allow complex subjects to be presented in a simpler and more comprehensive way. In a digital context, videos compensate for some of the visual aspects that are lost from traditional classroom training and contribute to increasing up-time and thereby, quality. There are aspects to the visual elements that are superior to traditional classroom training through its ability to give insights into parts in a much simpler way. For instance, if a technician in a workshop is unsure of how to perform some aspect of a repairation, visual elements can provide clear instructions on how that should be done. By leveraging the fact that many people nowadays have access to smartphones or tablets that are available at all times, the technician in question could access the instructions instantly, which would positively impact up-time. Moreover, this example is not only regarding access to instructions, but also a clear visual way on how the task should be performed. The compatibility to mobile devices also serves to reduce the market differences. It was mentioned by the market trainers that some markets have limited access to computers with internet connection, wherefore it would add value to be able to access the material and information from a mobile device.

Data from this study indicates that there is a need for increased collaboration between internal bus trainers and market trainers, as well as between the market trainers themselves. There is great value to be gained in creating a joint platform between market trainers and internal bus trainers, where information is stored and accessible for all trainers. Such a solution would not only enable market trainers to share experience and ideas, but also translated material and allow for material that has already been translated to be used in more than one market in which it is useful. Moreover, such a platform would enable the internal bus trainers at Volvo Buses to distribute material and valuable information easily at a single point. Market trainers would benefit as well since all information would be stored at one place that is easily accessed.

As mentioned, one of the main challenges is to ensure that the learning objectives from digital training are comparable to classroom training. Solutions such as VR could be leveraged to create a virtual environment where all aspects of classroom training are

incorporated apart from the physical touch and co-location. While AR has many benefits in its ability to add valuable features and information to reality, it does not put the training recipient in the environment in which he or she will successfully obtain tacit knowledge. VR enables exercises and practice to be done in an environment that simulates reality and therefore allows for tacit knowledge to be obtained without safety-related issues. VR does not require high initial investments since VR software is already developed and implemented in other departments at Volvo Group. Investments in hardware can be considered relatively low in relation to the travel costs from on-site training.

6.3. Recommendations for Volvo Buses

It has been found in this study that there is a demand for a *common platform* or network where the market trainers can share knowledge, translated material, and ideas with one another, and where the internal bus trainers can gain continuous feedback from the market trainers to ensure an enhanced understanding of the market trainers' needs. The empirical findings indicate that value could be added to Volvo Buses' training services from increased internal collaboration. Creating a common platform can not only promote collaboration, but also allow content, information and material to be stored and accessed in the same place. *Storing information at one access point* would make it more clear where to find relevant information. A prerequisite for this solution to be successful is to simultaneously ensure that IT support and navigation tools are developed. Search functions and an easily navigated structure reduces the potential information overload, and also saves the user time and effort. For these reasons, the researchers would recommend Volvo Buses to develop a shared digital platform that incorporates features to promote internal collaboration and where all relevant information can be easily accessed.

The researchers further recommend that the platform on which information, training, and materials are stored is *compatible with mobile devices* to ensure that it can be accessed 'on-the-go'. Another important aspect to ensure accessibility is to understand the differences in resources and needs in different markets and between different users. From this study, it is clear that access to the internet or stable wi-fi is a major concern, and that some only have access to a smartphone. From this, it would be favorable and valuable to ensure that information can be accessed without a stable internet connection. For example, it could be possible to download relevant materials to access later on. Downloading materials further allows the trainers to sort out and quickly get an overview of relevant materials. The importance of presenting information in a clear manner was highlighted in the empirical findings. It was found that one of the biggest demands from the trainers was an increased creation and *use of visual elements*. Visual elements function as a complementary asset in the learning process and allow for content to be presented more clearly. The researchers therefore recommend that it is prioritized in the short term to focus on creating images, videos, illustrations, animations, and other visual elements. This should be done with consideration to the needs and prerequisites of the market trainers to ensure that the visual elements can also be used by them and incorporated in their training.

The researchers recommend that *gamification* be used to increase the involvement of the students. Another challenge that is prominent in this study is the lack of active participation in digital training. It was found that increasing active participation can be done by lowering the threshold for asking questions during digital training, increasing the enjoyment of participating, and variation in the learning experience. The researchers would recommend a leveraging of simpler, easily understood, accessible applications, and digital tools that could address the aforementioned issues, but in a rather non-complex manner. This would allow for a quick increase in training quality in a shorter time. One such simple solution brought forward in this study is gamification. As it was found that there is a need to ensure value added and create a market pull before pushing a new solution, Volvo Buses should first use simple gamification. Simple gamification entails low costs and can be tested on the intended users before further investments are made. Assuming that gamification is appreciated and used effectively it would be valuable to invest in user-centered gamification that can adapt to market differences and individual preferences. The findings in this study highlight the social and cultural differences present in Volvo Buses markets, wherefore user-centered gamification is the long-term recommendation to promote involvement and a personalized learning experience.

To complement the recommendations made with a shorter time horizon in mind, the researchers recommend simultaneously working towards *developing VR* to satisfy the learning objectives of the training. Essentially, this means that the recommendations allow for a bridge to build where the different time horizons become compatible by allowing Volvo Buses the opportunity to invest time and resources into more complex, but valuable solutions, with the main priority laying in the development of VR. By bringing VR solutions to the training, the company will to a much greater extent be able to address the issues of safety and show in a more thorough manner where the safety issues lay. Additionally, it would give the market trainers much deeper insights into how the bus works in all the complex aspects of it, which means that a more qualitative training would be given to them and, in extension, the technicians. As initial software for VR has already been created and tested by other Volvo departments, it offers a low investment possibility for Volvo Buses, as well as internal knowledge and experience that can be leveraged in future development. Over time, implementation of VR could contribute to a longer up-time on the vehicles, since student performance would increase when training safely and with superior insights into the bus' components. Considering the market differences, the researchers recommend that a test group be put together from both developed and developing markets to gain valuable insights from the intended users and potential limitations and solutions that VR entails.

Whether it will be possible to fully imitate the experience and knowledge transfer in on-site classrooms is yet to be determined. But what can be stated, is that digital learning offers the benefits of time and resource allocation that can be argued to overshadow the lack of touch-and-feel and physical presence that was brought forward in the interviews. Not only that, but it may very well offer a greater learning experience as it is possible to conduct training without any safety issues as well as allowing virtual demonstration that deepens the market trainer's insight into how the vehicle works. The researchers argue that the resistance

in habits will fade overtime and that digital learning services can re-shape the way people learn. Furthermore, as digital learning services are argued to be a sustainable solution it is in line with Volvo's overall strategy - to be the market leader in offering sustainable solutions. To maintain their competitive position they should invest in sustainable and innovative alternatives such as digital solutions.

6.4. Limitations

There are several limitations to this study. A qualitative research approach does not offer general insights to the same extent as a quantitative can provide. The researchers considered the lack of generalizability in their choice of a qualitative case study. The choice of a single case study, i.e. Volvo Buses, further entails that the findings may be case dependent and may therefore not be directly applicable to other companies. It should also be highlighted that the research was conducted against the background of the Covid-19 pandemic. Given the scarce research which considers this aspect, the availability of secondary data was limited in that regard. This entailed that this aspect of the subject area could not be explored in depth. Another limitation of this study is that the sources about knowledge can be considered old. Although, previous research about this subject refer to these sources, wherefore it was deemed useful and relevant for the theoretical framework of this thesis.

The sampling for this study can also be considered a limitation as six market trainers were interviewed, of which each work in different markets. A larger sample size would have increased the reliability of the study. The researchers deemed it of greater relevance to include all markets than to get an in-depth view of one or a few markets. However, this entails that the perception of one market trainer might not be representative for an entire market. Furthermore, the interview guide used for this study was adapted for employees at Volvo Buses, wherefore it might not yield the same findings it used for another target group.

6.5. Suggestions for Future Research

This research has aimed to fill the current literature gap on a global organization's adaptation to an accelerated digitalization of learning services. To further expand the related theoretical field, there are several suggestions of future research that can be derived from this study:

- The researchers suggest that future research investigates the generalizability of the case dependent factors found in this study. This could be done by applying the concepts to a qualitative multiple case study or a quantitative study.
- The researchers suggest studying the implementation of digital solutions and tools in global organizations. This would contribute to an understanding of the application of the digital tools, such as gamification, VR and e-learning.

- This thesis has conducted its research on a global scale, with its findings being derived from data from all over the world. Future research, the researchers suggest researching the adaptation to a digital shift in a local or regional context.
- Another suggestion for future research is to measure the degree to which digital solutions and tools impact the learning objectives of learning services. A comparison of the reach of learning objectives from traditional learning services and digital learning services could evaluate the impact of digitalization on learning.
- Lastly, the researchers of this thesis recommend future research to incorporate the perspective of technicians. This study was focused on the TtT sessions and thus, disregarded the aspects of technicians and the role of market trainers as providers of training rather than receivers.

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Appendix A - Interview Guide for Internal Bus Trainer

Step 1: Interviewers

Step 2: The date on which the interview is being conducted

Step 3: Location or means of interviewing

Information given before it starts: We wanted to give you a little bit of background before we get started. Our names are David Ryfors and Vanja Lieback and we are in the middle of our final semester at the University of Gothenburg at the school of Business, Economics and Law where we have been studying the Master programme Innovation and Industrial Management. As many others do during their final semester of their programmes, we are writing our thesis and we are doing so together with Volvo Buses. The subject of the research that we are conducting is digitalization and learning. More specifically, we are analyzing the opportunities and challenges with implementation of digital means into the training parts of Volvo Buses, and what would add value to the aftermarket.

All answers given during this interview will be anonymous in our report. We will only use basic roles within the company to separate the interviewees. If you agree to this interview being recorded, the recordings and transcribed materials will only be handled by the researchers. You can end the interview at any time and if there is a question that you are not comfortable answering you are not obligated to do so. If you are interested, we are happy to send you the final report.

Initial Questions

1. Are you comfortable with this interview being recorded?
2. Are you comfortable with this interview being conducted in English?
3. If yes, could you please state your name and what your relationship to Volvo Buses is?
4. Could you please tell us a bit about your professional background?

Digitalization & Learning

5. In your own words, how would you describe digitalization?
6. Do you have any previous experience in working with any kind of change to or implementation of digital means into a process or organization?
 - If yes, how do you feel about the outcome of this change?

7. What do you believe are the biggest challenges with digitalization within learning?
8. What do you believe are the biggest benefits with digitalization within learning?
9. In regards to introducing digital learning tools to the training at Volvo Buses, what do you think are the main obstacles?
10. In regards to introducing digital learning tools to the training at Volvo Buses, what do you think are the main benefits?

Learning & Learning Process

11. In your opinion, what is the best way to present information in order for it to be remembered and understood? (writing, illustrations, images, audio etc)
12. After the training is done, how would you prefer to have the information stored so you (as a user) could easily go back and review it again?
13. What is your best example of information presented in a way that can easily be remembered and understood?
14. What aspect of the training do you think is the most difficult to understand/teach? Why?
15. Based on the current TtT, is there something that you think is missing from the training or tools being offered after the training?

Questions Specific for Internal Bus Trainer

16. Could you please tell us about your role in TtT?
17. Based on the improvements that you have made so far to the TtT, which one are you the most satisfied with, and why?
18. What aspect of the TtT seems to be the most appreciated by the trainers?
19. What aspect of the TtT seems to be the most confusing to the trainers?
20. Have you gotten any specific requests from trainers in terms of how the TtT is conducted or the content?

21. Have you heard of any tools or technologies used within Volvo Group that you think could be useful to incorporate in TtT?
22. What would you say the overall attitude towards digitalization is within Volvo?
23. What is your personal opinion on digitalization in general?

Final Questions

24. If you could choose one part of the current TtT that you think would be the most challenging to conduct digitally, which one would you say that is?
25. Do you believe, overall, that the TtT would benefit from digitalization?
 - If yes/no, why/why not?
26. Can you give an example of something in your professional life that has been simplified through the use of digital tools?
27. Is there anything that you would like to add to any of the previous questions, or something that you think we should consider that have not been discussed during this interview?

Appendix B - Interview Guide for Market Trainer

Step 1: Interviewers

Step 2: The date on which the interview is being conducted

Step 3: Location or means of interviewing

Information given before it starts: We wanted to give you a little bit of background before we get started. Our names are David Ryfors and Vanja Lieback and we are in the middle of our final semester at the University of Gothenburg at the school of Business, Economics and Law where we have been studying the Master programme Innovation and Industrial Management. As many others do during their final semester of their programmes, we are writing our thesis and we are doing so together with Volvo Buses. The subject of the research that we are conducting is digitalization and learning. More specifically, we are analyzing the opportunities and challenges with implementation of digital means into the training parts of Volvo Buses, and what would add value to the aftermarket.

All answers given during this interview will be anonymous in our report. We will only use basic roles within the company to separate the interviewees. If you agree to this interview being recorded, the recordings and transcribed materials will only be handled by the researchers. You can end the interview at any time and if there is a question that you are not comfortable answering you are not obligated to do so. If you are interested, we are happy to send you the final report.

Initial Questions

1. Are you comfortable with this interview being recorded?
2. Are you comfortable with this interview being conducted in English?
3. If yes, could you please state your name and what your relationship to Volvo Buses is?
4. Could you please tell us a bit about your professional background?

Digitalization & Learning

5. In your own words, how would you describe digitalization?
6. Do you have any previous experience in working with any kind of change to or implementation of digital means into a process or organization?
 - If yes, how do you feel about the outcome of this change?

7. What do you believe are the biggest challenges with digitalization within learning?
8. What do you believe are the biggest benefits with digitalization within learning?
9. In regards to introducing digital learning tools to the training at Volvo Buses, what do you think are the main obstacles?
10. In regards to introducing digital learning tools to the training at Volvo Buses, what do you think are the main benefits?

Learning & Learning Process

11. In your opinion, what is the best way to present information in order for it to be remembered and understood? (writing, illustrations, images, audio etc)
12. After the training is done, how would you prefer to have the information stored so you (as a user) could easily go back and review it again?
13. What is your best example of information presented in a way that can easily be remembered and understood?
14. What aspect of the training do you think is the most difficult to understand/teach? Why?
15. Based on the current TtT, is there something that you think is missing from the training or tools being offered after the training?

Questions Specific for Market Trainer

16. Based on your knowledge of how the technicians work, what do you think would be the best tool to offer in order for them to access the information needed fast?
17. Are there any recurring requests, criticism or questions that you have gotten from the technicians?
18. When you took part in the TtT, was it done digitally? If yes, did you think it worked well? What are the main positives and negatives?
 - If not, what parts do you think would be beneficial/most difficult to digitalize?
19. Do you remember your TtT?
 - If yes, what do you think is the main reason that you remember it?

- If not, why do you think you have forgotten the information? What could have been done differently?
20. Are there any tools that you can think of that would (förenkla) your work apart from the training?
 21. Have you seen any other companies provide solutions that you think would be beneficial for Volvo to implement?

Final Questions

22. If you could choose one part of the current TtT that you think would be the most challenging to conduct digitally, which one would you say that is?
23. Do you believe, overall, that the TtT would benefit from digitalization?
 - If yes/no, why/why not?
24. Can you give an example of something in your professional life that has been simplified through the use of digital tools?
25. Is there anything that you would like to add to any of the previous questions, or something that you think we should consider that have not been discussed during this interview?

Appendix C - Example of Coding

Example of deriving codes for the theme Practical Learning

<i>Second Degree</i>	<i>Codes Derived From Transcripts</i>
Touch-and-feel	
	Touch and feel
	Touch and feel
	Touch and feel - invaluable
	Can prepare for theoretical but not practical
	Problems with understanding abstract, can't touch
	Technicians need to touch
	Not as big need to touch as he got older, enough with figures
	Junior technicians bigger need for touch
	Touch-and-feel important for learning
	Need for touch-and-feel
	Old fashioned mechanics have a need to feel touch