



**ORGANIZATIONAL LEARNING AND ITS ROLE IN
USER ASSIMILATION IN THE CASE OF AN ERP
PROJECT:
A SUGGESTION FOR IMPROVED LEARNING GUIDELINES**

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Master's thesis in Information Systems

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Abstract for master's thesis

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<p>Abstract:</p> <p>Digitalization and the adoption of technological solutions characterize many current trends across organizations. A widespread example of this is the use of ERP systems to streamline business processes and improve efficiency. Most ERP-related literature focuses on challenges and best practices in the implementation phase of the system's life cycle, with less emphasis on the reasons affecting the actual usage and assimilation of ERP systems. Evidence suggests that organizational learning is crucial for the successful user assimilation of ERP systems. However, limited research has focused on understanding the factors affecting individual level learning in training design for ERP projects. This master's thesis investigates the role of organizational learning and factors influencing individual level learning in ERP system users. The study utilizes qualitative research methods, including interviews with a subgroup of a case organization. The findings suggest that organizational culture, motivation, perceived usefulness, social factors, and learning enjoyment impact the assimilation and acceptance of ERP systems. The study also identifies best practices for ERP training, including the use of a learning plan, diverse learning approaches and effective assessment of training methods. The results provide practical recommendations for organizations to improve their training strategies and contribute to the broader academic discourse on ERP system assimilation signalling the need for future research in this domain.</p>	
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1. INTRODUCTION

Much of the discussion related to digital transformation and technology adoption among organizations is centred on the idea that it is a necessary shift to secure one's competitive advantage in the current market; thus, an inevitable step in order not to stay behind. Yet, when discussing these major changes that are rapidly transforming businesses around the world, one concept is often raised in the conversation: organizational culture, and more so, a culture focused on continuous learning. Evidence shows that those companies that best achieve a seamless transition from traditional information systems to newer ones have already cultivated an organizational culture open to change and continuous learning (Leso et. al., 2023).

The previous decades have amassed a large body of ERP-related literature in the field of Information Sciences (IS) and there are clear signs that this progress will be ongoing (Ruhi, 2016). ERP, or Enterprise Resource Planning, is a software system that aims to integrate important business functions onto a unified and shared database. This allows for information and processes to flow efficiently across units, boosting productivity, decision-making and information management due to enhanced reporting and business intelligence capabilities (Kunduru, 2023). Nevertheless, this study will not be adding to the list of economic benefits and implementation success factors that constitute the wider scale of earlier research related to ERP systems, but rather, it will focus on two important aspects of the projects themselves: assimilation and learning. Most studies have focused on ERP implementation and adoption, while post-implementation review has received less attention, which are all phases of the ERP life cycle. Whereas implementation and adoption, from a project management point of view, deal with the installation of ERP within organizations, post-implementation aims to ensure that long-term advantages are realized through management support, user training and communication, to name a few. Recently, more research has been conducted about ERP assimilation, which measures

actual usage of the system, and its integration with organizational activities and individual tasks (Ha & Ahn, 2014; Shen & Khalifa, 2008)

As will be discussed in the following sections, organizational learning is less often considered as part of the discussion in trying to understand system usage (Nwankpa & Roumani, 2014). Still, one could argue that it is specifically the level of engagement from the user's side that determines the broader adoption of information systems, ultimately leading to a successful project. Moreover, related literature often draws a connection between an organizational culture of learning and individual level assimilation and acceptance of ERP systems (Guo et al., 2014).

1.1 Background to the research

The following research study draws inspiration from the researcher's personal experiences as a trainee in the central administration of a Finnish city. Since 2018, the organization has started to move closer to an Agile way of organizing projects, initiated by the service development department. Consequently, due to an update of the SAP ERP (R/3) environment to a newer version, SAP S/4 HANA Cloud, the organization has seen fit to try to distance itself from the more traditional waterfall model to better match current trends and demands. Essentially, this shift to cloud-based storing of invoices and purchase entries required a mass migration of data onto new warehouses and internal archives. This large-scale ERP reform is part of a service development project called Aura-hanke, which after its launch in 2020 has received an abundance of feedback from the city employees. Said feedback has undergone continuous screening to detect issues in the functioning of the system as well as to improve current processes to better match the changing operating environment. In fact, in spring 2022, the owner of the project received an extensive document with feedback from employees in the educational department, who had been using the new SAP S/4 HANA.

The document, together with other feedback sessions, proved that there was a lack of understanding about the functionality of the system as well as its effectiveness. On the one hand, higher management and project leaders were keen on promoting a modernized version of a system that is expected to bring economic savings and more efficiency in the long run. On the other hand, users have shown difficulties in engaging with the system and regard the implementation plan as being disconnected from the practical realities of their daily work. Over the course of three months, it became clear that top-to-bottom communication regarding the SAP project is insufficient and affects the overall trust in the project. Thus, the next stage is to open a discussion with the system users and identify the shortcomings of the project and how to mitigate them by considering user feedback more closely.

Various scholars discuss the importance of including end users in the learning process itself. User participation in ERP system implementation differs from conventional data processing and management information systems as it involves customization of various modules that directly impact user interactions with the system. Furthermore, the impact of individual users' capacity on ERP performance has received limited attention in studies, though it was found that individual users' absorptive capacity significantly contributes to knowledge transfer from ERP consultants to members of the recipient organization (Mayeh et al., 2016).

The remainder of the study will be structured as follows: Chapter 2 will provide a brief overview of the academic literature related to organizational culture and learning, its relation to successful ERP implementation, and finally some examples of organizational learning practices applied in ERP projects. Chapter 3 will consist of the methodologies chosen for the study and a description of the data collection and analysis process. In Chapter 4, we will discuss the results derived from the analysis. Chapter 5 aims to connect the findings from previous literature and the qualitative research analysis, together with a list of guidelines for the case organization to consider. Lastly, a mention of the limitations of the study and areas for future research will be included.

1.2 Research purpose and objectives

The goal of the research study is to understand the possible connection between organizational learning and the successful assimilation of ERP systems. Therefore, we should ask whether applying the correct knowledge sharing or organizational learning practices could affect the attitude toward use for a particular system. In understanding the differences in perceiving knowledge among user groups and in recognizing the preferences in learning, this study should provide a suggestion tailored to the needs of a particular organization (City of Turku) that has undergone an ERP implementation process and is seeking to gain wider user acceptance. More specifically, by including end users into the life cycle of ERP projects the organization can ensure that the adequate methods can be used in planning current ERP system training as well as post-implementation support. A common challenge among large-scale software projects is user's lack of understanding of the systems and its impact on their work and the organization. The organization's current practices involve process documentation and flowcharts to help users grasp the concepts as well as recurring workshops and Agile methodologies to facilitate dialogue between project leaders and users (T. Tenkanen, personal communication, March 2023). The goal is to encourage continuous feedback and progress discussions with a large emphasis on development and improvement of systems.

However, even with strong management support, system usage is not always guaranteed. An earlier study conducted about the city of Turku and its journey in the implementation of SAP ERP suggests that successfully transmitting a change in attitudes towards the system may be challenging. A resistance to change was prominent among the IT team and communication about the development project was at times insufficient (Huhtaniemi, 2016). Overall, the study suggests that the experiences of the City of Turku may be applicable to other organizations facing similar challenges.

Similar factors have affected the success of ERP system adoption across industries and one possible connection, which will be studied more in depth in the next chapter, is the existence of adequate user training and organizational learning practices. Used correctly,

they could mitigate the challenges in system usage and further engage end users with the system. More importantly, the study focuses on the individual level preferences of users and how giving more importance to different ways of learning can assist future user training design. Even though it would be interesting to study the example of multiple organizations, for the sake of not exceeding the limits of the research we will focus merely on the case of the City of Turku which, hopefully, will lay the ground for similar investigations in the future.

In short, the study will intend to answer the following questions:

RQ1. How does organizational culture influence user assimilation and learning in ERP Projects?

RQ2. How can organizational learning practices be adapted in order to enhance individual level ERP assimilation?

RQ1 will be addressed by analysing previous academic literature in the field. A literature review will be conducted in the next section after which the case study methodology will be introduced. Consequently, RQ2 is expected to be answered by studying the case organization by means of focus group interviews.

2. LITERATURE REVIEW

In the following chapter, a literature review will be conducted to establish the theoretical background of this thesis and serve as a framework for justifying the research objectives. Consequently, the analysis will attempt to study previous academic publications in the areas of Information Sciences, Knowledge Management, Project and Change management and Organizational Behaviour. Theoretical models and concepts such as the Technology Acceptance Model (TAM), organizational silos and organizational learning frameworks will be investigated, some more closely than others. Given the variety of

topics and definitions that will be discussed, a division into subsections based on themes is the suitable approach.

2.1 An overview of the research gap

Analysing the implementation of ERP systems, or any internal information systems design, is not a new phenomenon among the field of IS research. Such projects have been widely discussed from different perspectives, including uncovering of various challenges as well as lessons learned and success predictions. The same can be said of end user involvement in the said projects; a great number of articles and journals cover numerous perspectives on how users are central to the execution of successful or usable software project outcomes. After all, the product and service improvements made are directly impacting users' daily work and, thus, they are considered some of the more valuable components in showcasing if the project goals were met (Hendry, 2008). More importantly, previous research has proven a strong correlation between organizational learning and ERP system usage; thus, we will examine this connection in the coming chapter (Nwankpa & Roumani, 2014).

The practical purpose of an ERP system is to integrate business processes and functions by means of a uniform software platform and database (Chang, et. al., 2008). Its implementation both requires and stimulates cross-functional collaboration, meaning that information is shared and should flow between different departments of users dealing with a variety of workflows. As considered an investment at scale, organizations must ensure that the needed changes are implemented in order to have a smooth transition between an old system and the new one, which also requires the support of top management with a clear vision that is then successfully communicated to the rest of the employees, i.e., users (Chang et. al., 2008). In other words, when it comes to deploying an ERP system in an organization, its success is partially determined by how extensively end users within the company make use of it (Nwankpa & Roumani, 2014; Chung et al., 2008). Hence, one of the main concerns is ensuring that users have the sufficient knowledge and skills to understand the system, or else, having an organizational structure

that cultivates learning of ERP systems (Nwankpa & Roumani, 2014). Furthermore, according to Vandaie (2008), organizations ought to have an effective knowledge-sharing structure in place, if they are to implement a system (i.e., Enterprise Resource Planning). That initial condition is, therefore, necessary and it can be argued that the better companies understand the importance and issues in managing knowledge, the more likely they are to arrive with a well-implemented system resulting in competitive advantages (Vandaie, 2008).

Having said this, how can it be determined how well employees have understood the purpose of the ERP system or how does using it contribute to their current work? More specifically, if there are differences in levels of knowledge and comprehension, where do they stem from and how can these differences be mitigated? As mentioned earlier, a likely possibility, and the one we will explore more, is the role of organizational learning and training in assuring the transmission of knowledge to the end users. Perhaps, it is necessary to begin by considering how organizational culture and learning are defined, along with the characteristics of knowledge in conventionally hierarchical organizations. An understanding of end users shows to be of relevance in studying the changing levels of knowledge acquisition and might further emphasize the importance of training as a support in organization-wide projects. In addition, the concept of organizational silos will be briefly discussed to contextualize our research domain.

2.2 Organizational culture and learning

Alsabbagh and Al Khalil (2017) articulate *Organizational Culture* as being a set of values and beliefs held by members of an organization. This culture not only helps individuals to understand their own behaviour, but also provides a means of achieving certain objectives. Shaping people's behaviour is essentially a process of learning through which the core values of the organization can become more readily adopted by its members. In other words, the culture of an organization plays a significant role in influencing the attitudes and actions of its members and can be leveraged to promote specific goals

(Alsabbagh and Al Khalil, 2017). Moreover, Singh (2010) contemplates the importance of culture in shaping a *learning organization* as a way of responding to the demands of turbulent and rapidly changing business environments. In the context of this study, we are especially interested in the concept of learning organization, as it entails change as an integral part in shaping the organizational culture and promotes continuous improvement and a vision for long-term success (Crossan et al., 2011). In their article “Reflections on the 10th anniversary issue of the Journal of Management Inquiry: Who Is a Learning Organization?”, Crossan et al. reflect on the idea of a learning organization and its relevance in contemporary organizations; they argue that a learning organization is one that values learning and development as a strategic priority, and that this involves a commitment to continuous improvement, innovation, and adaptation.

Another concept that is closely related to learning organizations and connects the topic back to culture is development culture. *Development culture* refers to an organizational setting which emphasizes innovation, transformation and risk-taking in response to a continuously changing market environment, but it also addresses learning as an essential part of it (Langer & LeRoux, 2017; Jamrog, 2018). More specifically, development culture has been studied to have direct consequences for the successful assimilation of an ERP system (Shao et. al., 2012).

Likewise, organizational culture in its different types has been found to, both directly and indirectly, influence ERP success as it can foster knowledge sharing and add to the organizational memory (Shao et. al., 2012). Roberts et. al., (2017) continue to suggest that the concept of IT assimilation is positively correlated with the organization's general level of knowledge over it as well as knowledge diversity. What we can conclude from here is that both organizational culture and organizational learning are related to the extent to which organizations are able to leverage the potential of their technology and users' capabilities of adopting such potential into their line of work. While the last statement does not directly focus on the study's quest for understanding the factors explaining the differences in learning about the use of IT systems between individual users, it is useful to understand the conceptual frame of how the process happens. Hence, the role that

knowledge sharing plays in an organization stems partly from culture and affects overall organizational learning (Zheng, Yang & McLean, 2010; Nugroho, 2018).

In the meantime, Chadhar and Daneshgar (2018) highlight that a gap exists among ERP-related literature about “how organizations engage in learning and how organizations transform learning when appropriating ERP systems”. As for existing ERP research, most of it merely focuses on success factors and economic outcomes without addressing the role of learning in the implementation process (Chadhar & Daneshgar, 2018). Similarly, in their study, Mthupha and Bruhns (2022) included human resource factors as variables for predicting and explaining ERP system acceptance to complement the existing discussion about challenges in ERP implementation. Said HR-related factors consider staff support, job satisfaction, employee motivation, training and change management as critical to control to achieve wider user acceptance of ERP (Mthupha & Bruhns, 2022). For the purpose of this study, we are most interested in employee motivation and training as supporting actors in organizational learning yet involving the implicit benefit of acceptance and attitude to use, when applied.

2.2.1 The role of knowledge in learning

When contemplating theories about the differences between Western and Japanese companies’ success in leveraging their skills and expertise, Nonaka and Takeuchi (1995) claim that its most basic explanation is the ability to create human knowledge. In their book “The Knowledge Creating Company”, Nonaka and Takeuchi (1995) discuss the importance of a business to think about what they do with their knowledge and emphasize the complementary qualities of explicit and tacit knowledge in such a process.

In continuation, we will go through some definitions of knowledge and consider its relation to learning, specifically in ERP projects. In their book about Knowledge Management (KM) in organizations (2018), Hislop et. al, reflect on the epistemology of the concept of knowledge in the KM literature from two broader perspectives: the objectivist and the practice based. The objectivist perspective, often called the mainstream

view, entails that much of organizational knowledge is considered objective in nature by taking the form of an object or entity which is both possessed by a person and separable from them through codification. This characterization treats knowledge as a cognitive commodity and prioritizes explicit knowledge over tacit as it emphasizes knowledge that can be produced in a formal manner without individual subjectivity. The objectivist perspective generally views the different forms of knowledge (i.e., explicit and tacit) as separate. On the other hand, a practice-based perspective conceives knowledge as a practice, thus inseparable from people who engage with it. Jones et. al (2006, p 412) go further in the following quote by juxtaposing both characterizations of knowledge occurring in organizations:

“Knowledge is a multi-faceted concept and is embedded within many entities in an organization including the organization's culture, policies, documents, and members themselves [1]. Knowledge is often described in terms of a taxonomy of knowledge types (e.g., tacit vs. explicit, individual vs. collective, declarative vs. causal vs. relational). However, another way knowledge is described is in terms of its pragmatic nature. The pragmatic facet of knowledge taps the types of knowledge that are useful to an organization such as knowledge about products, best practices, business frameworks, and projects [1]. The way knowledge is shared among individuals is tied to its pragmatic nature [18].” (Jones et. al, 2006, p 412).

When revisiting Nonaka and Takeuchi’s perspective on the significance of knowledge in establishing companies, products, or services with a competitive edge, another counterpoint emerges. Diverging from numerous traditional hierarchical structures where knowledge mainly flows in a top-down manner, Nonaka and Takeuchi suggest an alternate approach to the flow of knowledge. In this alternative model, knowledge is not solely treated as a top-down resource but is actively generated, shared, and refined across various organizational levels, leading to a more dynamic and innovative approach to value creation (Nonaka and Takeuchi, 1995).

Considering knowledge is an important component in our study about organizational learning and attitudes towards system usage, a much lengthier section would be needed

to cover it more thoroughly. In this section, we are mainly interested in the role that knowledge plays in the learning process itself and its function as a building block in the collective acquiring of expertise and thus, a different study would better serve the purpose of diving deeper into the character of knowledge in the organization.

Depending on the field of study, *learning* entails various definitions, however, in the organizational context it is mostly referred to as “a combination of process outcomes, in the form of knowledge and routines in the organization’s culture” (Nugroho, 2018). As a highly complex process, learning cannot merely be viewed as a result of individual accumulation of knowledge since it is the result of norms and values attached to a culture, which in turn is learned from collective experience (Nugroho, 2018). An adapted framework for organizational learning by Nugroho is presented (*Figure 1*) which is inspired by the Crossan’s et. al. model that interpreted the learning process from three levels; individual, group and organizational (Nugroho, 2018; Crossan et al., 1999).

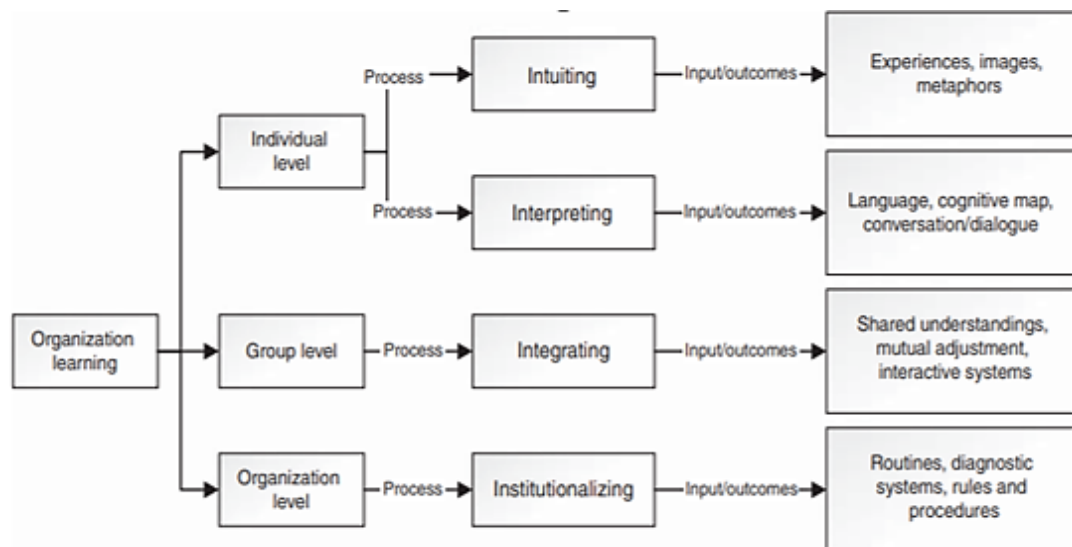


Figure 1. Nugroho's learning process model adapted from Crossan et al.

Argote and Miron-Spektor (2011) go further stating that the most common definition of organizational learning is *a change* in the organization’s knowledge which occurs as a result of experience. There are both explicit and tacit components to this knowledge, which can manifest itself both in changes in cognitions and behaviours among employees. Moreover, many types of repositories could store knowledge, including individuals,

routines, and transactive memory (Argote & Miron-Spektor, 2011). A major component of ERP implementation is sharing of the individual's or group's knowledge about business processes and frameworks as ERP entails integration of those processes across the organization. Then, for this individual or collective knowledge to be of use to others, it requires to be expressed in a way that is interpretable by the receivers (Nugroho, 2018).

2.2.2 Information silos

As the exchange of knowledge can be considered the main source of organizational learning, the dynamics of how knowledge is being shared across teams and departments, leading to possible retainment of information, should be considered as part of the discussion about system learning and assimilation (de Waal et. al., 2019). In organizational literature, clusters and silos are often treated interchangeably, although the latter tends to carry a more negative connotation (Bento, Tagliabue et.al, 2020; de Waal et. al., 2019). Metaphorically speaking, silos are a phenomenon that exist in organizational entities due to structural barriers between teams which often hinders knowledge from flowing or being shared from one entity to another (Bento, Tagliabue et al., 2020; Serrat, 2017). Nonetheless, coordination and communication are requisites for organizational progress, which seeks collective intent.

Despite the mutual acknowledgement of its importance, organizations and more so the larger ones, struggle conjoining sub-systems to improve contributing functions (Serrat, 2017). While environmental complexity has contributed to the formation of organizational silos, scholars do not view it so much as a product of the barriers created by technological advancements and increasing adaptation rate of information systems but more of a cultural phenomenon (Bento, et. al., 2020). Silos are seen as a creation resulting from the interrelations between behavioural, environmental and cognitive factors, and as such “they encompass a multi-perspective approach: organizational decision-making and socio-cognitive frames and economics, which are concerned with the role of incentives (and costs)” (Bento et. al., 2020, p 2). Bento et. al. (2020) also argue that as a result of the increasing complexity of organizational networks, some temporal sub-groups tend to form. Interestingly, an organizational structure with highly connected networks without sub-groups helps the spreading of simple information but on the contrary, when the

information is complex in nature, favouring local social reinforcement may be more effective (Bento et. al., 2020).

Another group of scholars discuss the pros and cons of silo formation within organizations:

“In the management literature, organizational silos are defined as psychological boundaries creating compartmentalization, segregation, and differentiation [9]. Silos can offer a practical way for organizations to operate efficiently in managing large numbers of people and allocating accountabilities and responsibilities within a hierarchy. They can create clearly delineated ‘cultural tribes’ that people identify with, and tightly defined teams or communities that people are motivated to work for, as well as to feel safe within” (de Waal et. al., 2019).

Conversely, the identification with cultural tribes can contribute to an insular mind-set which hinders cooperation across boundaries and negatively affects business performance. de Waal et. al. introduce the concept of *silo mentality* - when teams or members of the same organization purposefully retain important information from other members - and what factors are most important in breaking it down and boosting cooperation (de Waal et. al., 2019). The premise of their hypothesis argues that “the more complex, dynamic and turbulent the organization’s environment is, the more necessary organizational learning is considered to be”, which ultimately requires knowledge exchange between various departments. The study shows that to overcome the negative outcomes of silos, there are several *silo-busting techniques* that can be applied, including common values, collaborative operating model and environment, leadership promoting collaborative behaviour as well as rewarding employees for cooperation and development. In conclusion, the study revealed a significant relationship between the number of silo-busting techniques, the degree of organizational learning and knowledge exchange, and the quality and outcome of collaboration (de Waal, et. al., 2019).

2.3 Factors affecting individual learning and assimilation

In order to understand the process of knowledge acquisition and learning in organizational contexts, it is reasonable to examine system users and how they are as learners. *Assimilation* as a concept occurs both on an organizational and individual level and can be described as the degree to which the use of a certain technology diffuses across the organization by becoming a routinary activity (Guo et. al., 2014). It can be argued that both learning, and assimilation are desired behaviours that directly affect the use and effectiveness of ERP systems and for that reason, they will be more closely inspected in the following chapter.

Classical learning theories and pedagogical models can be used as a guideline for selecting training practices and to achieve a deeper understanding of possible learning processes and styles. In a comparative study, Leavitt (1998) presents three different organizational learning theories: two of them - *experiential learning theory* and *adaptive & generative learning theory* - follow the thinking or cognitive perspective, while *assimilation theory* is grounded in the behavioural school of thought. Whereas all theories have their strengths and differences, we will be considering the experiential learning theory (ELT) for now and investigate how it can be deployed in a framework for ERP training practices (Ruhi, 2016). The experiential learning process is grounded in the assertion that “people learn through their discoveries and experiences which shape the way we grasp knowledge, and these experiences consequently affect our cognitive development” (Ruhi, 2016).

The experiential learning process (see Figure 2) shows the cycle by which knowledge is created through transformation of experience in four stages. The individual learner first interacts directly with the phenomenon by acquiring *Concrete Experience* which is initially based on feeling rather than systematic conceptualization. This leads to *Reflective observation* during which the learner formulates opinions about the occurring through listening or watching and connects it to their own thoughts and feelings. The next stage involves *Abstract Conceptualization* where learning by thinking takes place: opposed to simply relying on feelings, the learner applies theories and analyses ideas to give meaning to situations. Finally, *Active Experimentation* allows learning by doing through

interactive experimentation about the subject of investigation. (Ruhi, 2016). In other words, here is where the practice-based knowledge acquisition takes place, and the individual adopts solutions and actions based on what works rather than absorbing information passively.

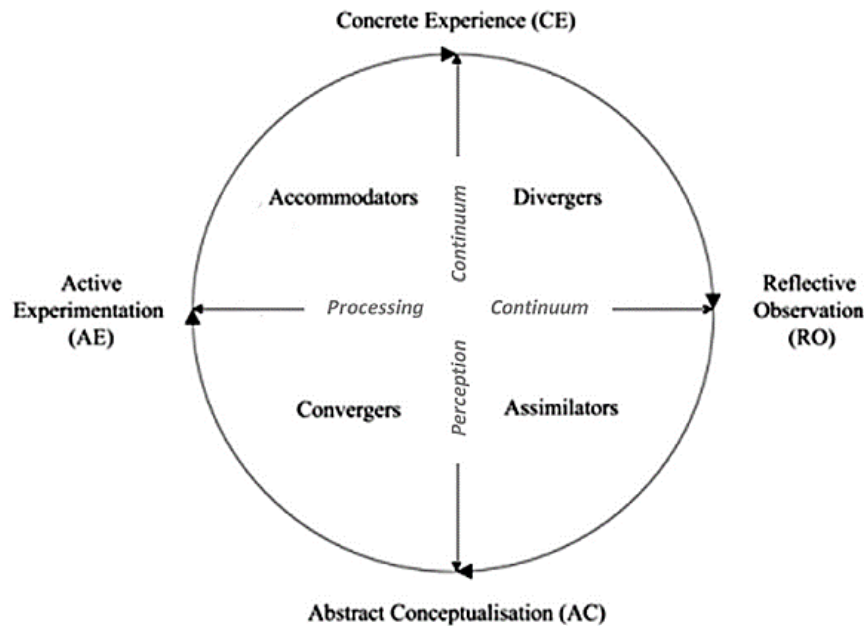


Figure 2. *Experiential learning stages and learner styles (based on Ruhi, 2016)*

In addition to the learning cycle, the model also identifies four distinctive learning profiles that highlight in which conditions or stages the individual learning is optimized. This includes considerations about their learning needs and preferences.

- *Accommodators* prefer learning through concrete experience as opposed to theoretical knowledge. These types of learners learn best when offering hands-on opportunities.
- *Divergers* are learners who enjoy considering multiple viewpoints and gathering relevant information across various sources when learning.
- *Assimilators* prefer to learn by organizing use a logical path of thinking while organizing the learned information in a concise form.
- *Convergers* learn most efficiently when they are presented with learning opportunities in which theory can be applied to practice. Finding solutions to realistic scenarios or problems is their forte.

All this considered, the experiential learning theory is grounded in the idea that everyone possesses a dominant learning style though it is more likely that different styles can be adapted and vary from context to context. Moreover, ELT proposes a useful pedagogical framework that focuses on learners and ways in which they interact with different learning environments (Ruhi, 2016). While the ELT model offers a fairly holistic approach and is a valuable from the point of view of academic research about ERP learning design and practices, the field has seen numerous models that attempt to explain the tendencies and likelihood of users in interacting with information systems.

One of the best-known theoretical models explaining user behaviour is the *Diffusion of Innovation* model by Everett Rogers who identified five types of technology adopters: Innovators, Early adopters, Early majority, Late majority and Laggards. While the model dates to the 1960's, it can still be considered a useful method to predict user's response to new information systems within organizations. For instance, when launching an ERP system, the IT unit may choose to identify and work with innovators and early adopters first, then leverage their adoption to drive the whole project (Bourgeois, 2019). In another study conducted by Schiffman et. al (1992), end-user types differ greatly in terms of system usage and dependency; sentiments toward EUC (end-user computing), organizational support, end user training and demographics are found to be some possible predictors of software acceptance (Schiffman et. al, 1992).

Finding articles or models that explain user types simply but uniformly was more challenging than expected as most studies apply a range of different user attributes for establishing connections between technology assimilation and acceptance (Mayeh et al., 2016; King & He, 2006). Therefore, the stereotypical way of classifying employees into IT-professionals and non-technical users shows to be insufficient in describing characteristics of users or their relations towards system usage. The second issue seems to be that a large part of previous literature concerning user types is rather outdated, given that the user scene has changed significantly in the past three decades. In the words of Govindarajulu et. al (2008) "Many researchers still use the end user classification scheme proposed by Rockart and Flannery (1983) more than two decades ago.", while current users are generally much more technologically inclined than before - a statement that was itself written 15 years ago. Due to these limitations, we will compare some more recent studies and updated versions of older models discussing the differences in learning new

technologies and find out some relevant variables that are seen to affect the acceptance and use of ERP systems. The theories will not be presented in any order, although investigation of assimilation and learning in individuals is a common thread among all works.

2.3.1 TAM model and its variations

First, we will briefly attend to a well-known model introduced by Fred Davis (1986) called the Technology Acceptance Model (TAM) which investigates factors affecting users' acceptance of new technologies. TAM has been widely treated in academic literature since its introduction and has become a relevant model in explaining human behaviour towards acceptance through its numerous extensions and modified applications (Marangunic & Granic, 2015). The model consists of three elements that explain the fulfilment of user motivation: *perceived ease of use*, *perceived usefulness*, and *intention to use*. In summary, Davis argued that the act of using or rejecting the system is affected by the intention to use by the user, which in turn is influenced by perceived usefulness and perceived ease of use. The former refers to the scale by which an individual believes that using the system could enhance their job performance, while the latter determines how easy they believe it would be to use. Post-experimentation, the model was later complemented with other variables that affected the mentioned relationships and later, an extended model was introduced by Venkatesh and Davis (see Figure 3.) (Marangunic & Granic, 2015).

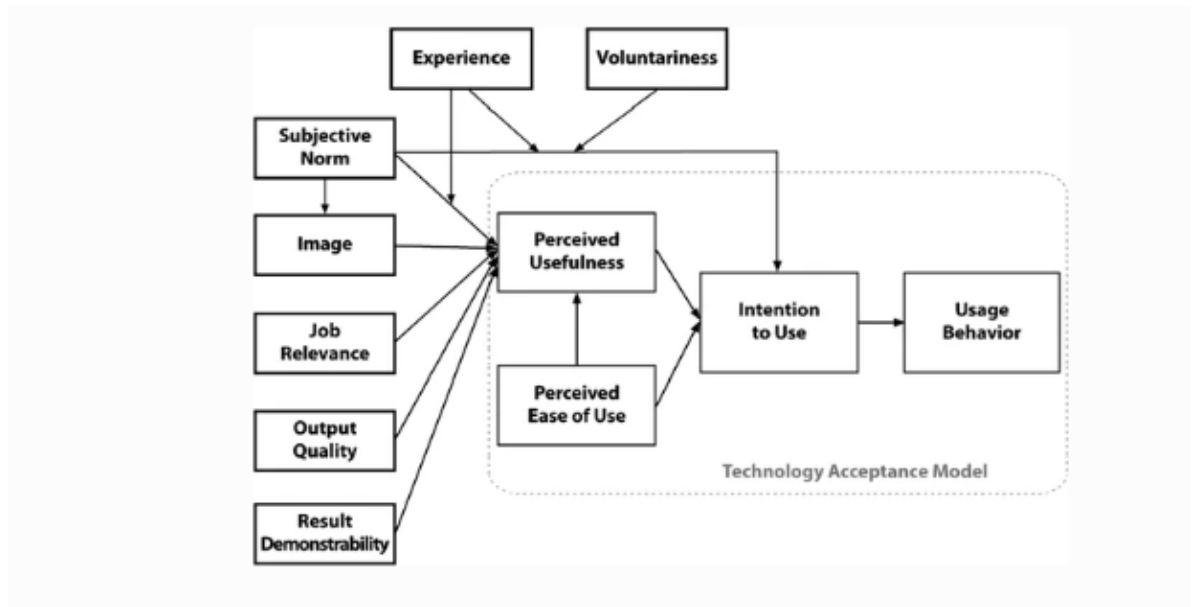


Figure 3. *Extended Technology Acceptance Model by Venkatesh and Davis.*

The TAM model has also been referenced extensively in ERP related literature, and recent studies have tested the application of the model to ERP software implications to predict user behaviour and usage intention (Lakawathana, 2018). As for most technologies, the findings show that *perceived usefulness* and *perceived ease of use* are highly correlated with the acceptance of ERP software. Despite the TAM model's relevance in predicting ERP outcomes, research is still ongoing as it has been emphasized that most studies on the model's applicability in ERP settings differ largely in context, which limits the establishment of a uniform hypothesis. Moreover, Lakawathana (2018) discusses factors affecting learning of ERP software for non-technical users by including the concept of *learning enjoyment*. The study refers to Venkatesh's extended research of the TAM model, in which learning enjoyment emerged as an important external factor in explaining software usage. Closely connected to intrinsic motivation, *learning enjoyment* refers to how enjoyable it is to use the technology or systems independently of their performance consequences. Furthermore, by means of a structural model, the study examined three constructs affecting learning enjoyment: learner's self-efficacy, teaching style of instructors and a relaxed learning environment. The result indicated that an ability-based learning style of the instructor's had a significant effect on non-IT learner's self-efficacy, which in turn was the only factor that directly affected enjoyment (Lakawathana, 2018). In other words, what can be derived from this research is that when an instructor's

teaching pace best reflects the learner's abilities, the more self-sufficient learners become, resulting in learning enjoyment. Conversely, having a relaxed learning environment did not contribute significantly to a non-IT learner's ability to use ERP software.

Intention to use is also highlighted in an article by Mayeh et. al. (2016) as one of the main predictors of user's adoption behaviour. The article bases their investigation on the TAM model by examining three external variables - *absorptive capacity*, *communication* and *trust* - and how they affect the intention to use ERP systems. In the research context, absorptive capacity refers to the capacity of the employee to value, assimilate, and apply the new technology; additionally, it encourages knowledge creation and the ability to perceive innovation. Moreover, effective communication has been argued to enhance trust development and increase knowledge transfer within the organization. Findings show that absorptive capacity influenced how easily users learned to engage with ERP systems and how useful they perceived it. As a result, sufficient sharing of knowledge prior to implementation was deemed important and stressing simplicity in ERP design as well as pre-implementation training to help users likely results in increased usage (Mayeh, 2016).

2.3.2 The role of motivation

Another group of authors continues to suggest the important role of intrinsic motivation on individual level assimilation of ERP systems. A study made by Guo et. al. (2014) further explore how organizational learning culture contributes to the degree to which end users make use of the system in post-implementation phase. Through an empirical research model, it was found that individual level assimilation was positively impacted by the user's motivation and perceived usefulness while organizational culture played a moderating role. Practical implications of the findings involved some guidance for individual level assimilation. For instance, top managers are encouraged to cultivate employee motivation by offering readily available assistance for user's encountering difficulties during system usage, by establishing performance objectives and providing effective ERP training to showcase the usefulness of the software along with the technicalities. Other suggestions included supporting user's participation in decision making as well as promoting an organizational learning culture of open communication,

which increases the likelihood of user's motivation to learn and assimilate ERP systems (Guo et. al., 2014).

2.3.3 Social, affective and personality factors

Next, a paper conducted by Chang et. al. (2018) presents a conceptual model that has evolved from the Triadis Theoretical Network. The original Triadis framework (1980) presupposes the role of affect (i.e., emotions), social factors, facilitating conditions and consequences in the assimilation of technology. As outlined in the Triadis model, the likelihood of performing a given behaviour depends on three factors including habit, facilitating condition and intention. Behavioural intention is affected by social factors, affect and consequences of completing a behaviour. Chang et. al. apply the model to predict ERP system usage at the workplace by replacing intention with actual behaviour or usage accomplished and adding compatibility.

The findings from the conceptual model indicate that (1) *social factors*, such as the amount of social pressure felt by the users, (2) *compatibility*, as in, how compatible the system is with the user's working mode and (3) *near-term consequences*, which estimates how much using the system adds to the quality and efficiency the job itself, are found to have the most significant effect on ERP system usage. Other variables are found to be significant, for example, *long-term consequences* which measure career development effect, whereas *complexity* seemed to not discourage system usage. A possible explanation to the low effect of complexity could be that most ERP system users only apply a limited number of modules such as simple reporting. All in all, while it is difficult to completely predict ERP assimilation success by means of a study, it is useful in showcasing the importance of end-user involvement and creating a supportive social environment that encourages system use (Chang et. al, 2018).

Finally, some more recent studies about learning in ERP projects include the examination of personality types and how they may play a role in determining performance. A study conducted by Lea et. al (2020) measure the effect of respondent's personality score based on the Big Five personality traits (conscientiousness, neuroticism, extraversion, openness and agreeableness) in their ERP learning performance. More importantly, the model

included moderating factors such as prior knowledge, user affect, demographic and environmental characteristics to measure which users would most effectively learn to use ERP systems. In the results, the effects of the personality traits were reduced or enhanced by the moderating factors (see Figure 4.) For instance, if the mentioned personality types were younger than 30, showed more excitement toward technology and had less IS experience, their performance was enhanced. To narrow the scope of this study, the main analysis will not go deeper into different personality traits, but they are related to an important concept called *resistance to change* and show a connection to relevant elements about the background of the users.

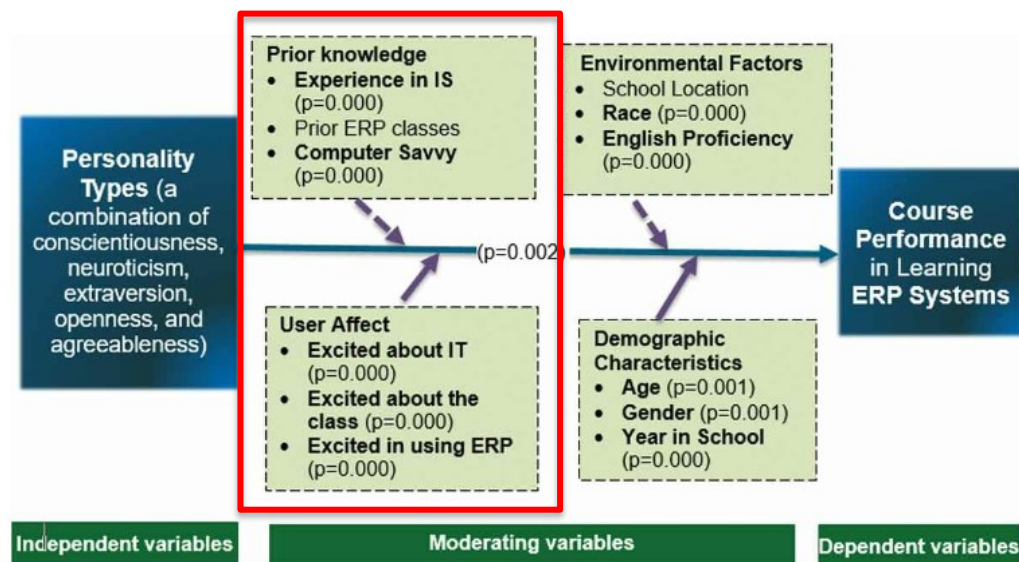


Figure 4. Variables affecting ERP learning performance, including personality by Lea et. al.

Nov and Ye (2008) believe that as in the case of all information systems, their success and use is largely determined by the level of user acceptance, or resistance. Additionally, personality differences have been long used to predict human behaviour and “predispose technology users to behave in certain ways under different situations” and that explains why individuals also react differently to changes in the workplace. User resistance is seen to have a vital role in IT-enabled change and is linked to decreases in the power shift due to the introduction of a new system. The model testing was done by investigating the behaviour of new users while using a university digital library by identifying the level of resistance to change (RTC), which shows to have a significant impact on the systems ease

of use perceived by the users. The study indicates the importance of including RTC as a deciding factor in users' acceptance of digital systems and emphasizes the need to align user's personal characteristics with system design to enhance system usage and effectiveness (Nov & Ye, 2008).

In conclusion, the assimilation of ERP systems is influenced by a complex interplay of factors, as evidenced by various studies in the field. The Technology Acceptance Model (TAM) first proposed as a foundational framework for understanding user acceptance of new technologies. Within the framework, perceived ease of use, perceived usefulness and learning enjoyment are key determinants of intention to use, which, in turn, affects actual system adoption. However, the applicability of TAM to ERP settings varies due to contextual differences, limiting the establishment of uniform hypotheses. Besides TAM, other studies have found that organizational culture, including motivation, trust, and open communication, enhances individual assimilation. The Triadis model highlights the effects of social factors in ERP system usage. Personality traits affect ERP learning performance, suggesting that individual differences can impact how effectively users adapt to these systems as well as resistance to change. In essence, the successful assimilation of ERP systems is a multifaceted process influenced by a combination of user-related factors, organizational factors, and system characteristics.

2.4 Organizational learning practices in ERP projects

As mentioned previously, ensuring a proper learning experience for ERP users by using the adequate training methods is of crucial importance. In this chapter, we will look more closely into how learning practices are organized in ERP projects and attempt to give specific examples of the importance of training throughout the process. One of these steps includes diving deeper into the lifecycle of ERP systems and observing the role of learning and training in each step (Esteves, 2014). Moreover, during the past decade various university programs have already incorporated ERP and business process management courses as a response to the growing trend of organizations digitizing their processes and implementing ERP software. Yet, considering the complicated nature of integrated information systems such as ERP, teaching it presents its own challenges and

previous research reveals that students who have not previously been exposed to ERP systems or similar, tend to have difficulties learning its use. While traditional pedagogical approaches have fallen short in bringing effective learning outcomes, scholars have proposed multidimensional learning theories and frameworks that combine teaching practices, which consider different individual learning processes and styles more closely (Ruhi, 2011).

The process of implementing ERP systems successfully is closely determined by end user education and training (Nwankpa & Roumani, 2014). According to Nestell (2020), cultivating organizational change successfully through ERP system implementation, both functional and conceptual knowledge are needed. This means that the learning process ought to be approached in a structured and deliberate way to ensure proper ERP learning and training. While the technological and functional requirements along with business processes are an important part of ERP training, organizations often fail to take into consideration the conceptual aspect of end user training. What is more, the time provided for proper training is often insufficient, especially considering that adopting new IT solutions are often implicated by a learning curve¹. It is important for the end users to understand the possible issues during process execution and how they can be solved, so that the process is built into muscle memory by the time the system is launched (Nestell, 2020).

One way to support organizational ERP learning is through the practice of *scaffolding*; a process which moves users to a progressively better understanding of ERP, from general and conceptual to more function-specific training of ERP systems. The learning process can include formal training, such as classroom pilots and user acceptance testing, which are often not enough to train employees to utilize ERP solutions in the “real world”. In order to help users transcend their knowledge beyond a classroom setting, organizations should offer continuous support and training, in which change management has an important role (Nestell, 2022). Having an organizational change plan can help users to understand the value of organizational learning conceptually, but also include actions that measure and improve the desired performance outcomes. One of the frameworks suggested for evaluating individual level learning is the New World Kirkpatrick model,

which can be used to design an integrated training and evaluation plan (Jalovaara, 2016; Nestell, 2022). The model consists of four main stages; Stage 1 measures how engaging and relevant users found the training, Stage 2 estimates what skills and attitudes were acquired by the user, Stage 3 evaluates the degree to which users can apply the learned knowledge in practice and Stage 4 measures whether the desired goals and outcomes are met.

Moreover, Zacharias (2018) discusses important learning initiatives in the organizational context by applying the Learning Organization Model (Figure 5).



Figure 5. Learning Organization Model

In the model, Zacharias describes three key aspects of a learning organization, which are learning environment, learning processes and practices and leadership. Learning environment refers to the organization's ability to provide a space for employees to safely express their opinions and share new ideas, encouraging innovation. By applying learning processes and practices, organizations gather different kinds of information from inside and outside the organization and use it to solve problems and figure out trends. This includes sharing what they know by training people with different methods, while

continuously assessing how well that information is received by the employees. Lastly, leadership plays a role in ensuring learning and improvement is continuous by setting an example to other employees. The notion that leaders themselves are learners, who learn from their mistakes and actively engage in problem-solving, is crucial (Zacharias, 2018).

According to Sarder (2016), the learning plan (see Figure 6.) should embody the vision and goals of the organization, teams and individuals; the competences required to achieve these goals; the methods to be applied and evaluate the desired outcomes. Below, we will go through a short description of the four elements of the learning plan:

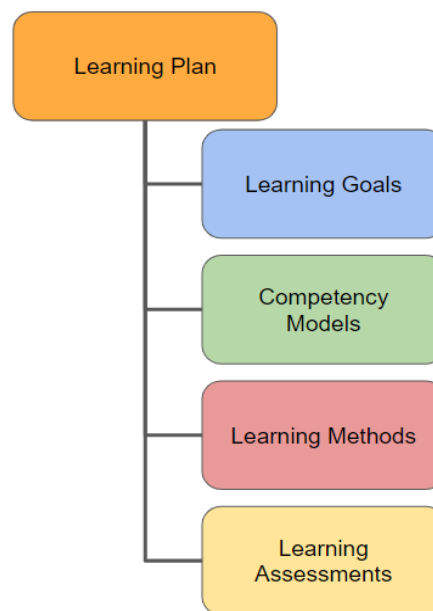


Figure 6. Based on Sarder's Learning Framework (2016)

1. Learning goals describe the future state or situation that the organization wants to reach when the goals are implemented.
2. Competency models determines the specific competences, skills, knowledge and abilities that are needed to fulfil the mission on the goals. For example, whether the organization's strategic goal is to increase cost-efficiency by implementing a new information system or software, they can determine the technological competences the employees have to learn.
3. Learning methods provide the practical arrangements for acquiring said knowledge and competences in users. These methods can be roughly divided into five categories:

- Physical or virtual classroom programs
- Self-study programs such as reading manuals, e-learning platforms or video or audio recordings provided for individual training
- On-the-job training offers a more practical approach for the individual to learn by doing
- One-on-one coaching can involve a setting where the user is instructed by a key-user of the new system and one can ask questions and guidance directly
- Mentoring

4. Learning Assessment

While there is no universal, one-fits-all approach when selecting learning methods, organizations should consider differing learning styles and preferences (Sarder, 2016). Some employees prefer learning on their own and through trial and error, whereas others learn best in group-settings where they can ask direct questions. Other factors influencing the learning method design are the nature of the taught material, the timeline of the required change or implementation, budget and how learners are located. In conclusion, the effectiveness of the best learning program depends on several factors and are designed to meet the abovementioned criteria (Sarder, 2016).

The purpose of learning assessments is to observe how well educational programs are working and if goals are not being met, identify what changes ought to be made. Essentially, without a proper assessment system in place, organizations run the risk of using programs that have ceased to be relevant or effective while wasting resources. When assessing the training and mentoring programs, designers should respond to questions such as: are the goals being met; are they relevant or achievable; are resources being efficiently spent and what is the return on their investment? (Sarder, 2016).

Moreover, an important step in designing the learning plan, is to consider the appropriate team size and composition as well as time allocated for the learning (Sarder, 2016). For instance, management should keep in mind possible conflicting priorities, tasks and vacation time as there can be times of the year when much of the personnel is taking time

off. Likewise, the size of the training group should be considered when designing the training program; for some instances, larger teams are suitable to train at once while smaller teams and one-to-one sessions can better serve their purpose for users who need more support. In the end, learning is fostered across the organization both individually and collectively and should align with the needs of the receiver being trained as well as organizational goals (Zacharias, 2018).

According to most previous ERP best practices literature, to effectively use and implement ERP systems requires a model of training “over an extensive period of time which utilises external consultants as part of the training plan”, yet, as ERP implementations often occur during a short timeline, that makes it difficult for trainers to transfer the knowledge to the users. The same is true for using more innovative training approaches; to minimize risks, it is advisable that organizations follow the appropriate ERP training strategy to ensure that the implementation goes well the first time. Similarly, studies emphasize the need to properly invest in training as it shows to have a direct consequence on overrun costs and time of ERP projects (Esteves, 2014).

Based on the results of the research conducted by Esteves (2014), a comprehensive list of ERP training best practices is composed, which has been summarized and modified in the table below (Table 7.). The table showcases 24 suggestions or actions that an organization can take to improve the effectiveness of ERP implementation as well as assimilation levels both during and post-implementation. The items on the list suggest an optimistic scenario, in which organization allot enough time and resources into an ERP project, but which might not be the reality in all cases, especially for small and medium sized companies.

ORGANIZATIONAL LEARNING AND USER ASSIMILATION

Using a customized ERP system	Trainers: a hybrid team of internal users and consultants	Trainers with experience	Create continuous training programme	Contingency plan for refresher courses
Having full-time support centre	Free users from daily activities	Involve users in training course design	Extend training beyond use-to-implementation issues	Training manuals - both online and within ERP system
Training must respect critical periods/dates	Training planned in advance	Give users exercises before go-live	Informal training by employees	Involvement of HR in training process
Organizational alignment focus	Provide an ERP system for testing	Training language=company language	Encourage knowledge sharing among users	Use e-learning tools
End-user training 1-2 months before ERP go-live	Training content focused on user's short-term needs	Monitor and control training budget	Create methods of training evaluation	

Table 7. *Modified table with ERP training best practices by Esteves (2014)*

Furthermore, Esteves (2014) states that some organizations treat training as a one-time support activity within ERP implementation projects while others recognize it being a multi-phased process. The readiness for ERP training depends on factors such as training and change management strategy, training cycle processes, evaluation tools and methods. Hence, it is important to assess the readiness before undertaking training and understand the audience and their specific skills and knowledge in relation to the new system (2014). According to the reviewed literature, organizations ought to also consider the composition of the training group (see Table 8.), the type of training to be undertaken by each group of personnel and the training schedule.

Managerial personnel	Key-users	Other End-users
Usually, key members of their departments and members of the functional team	The core of users entrusted with system testing and training other end-users	Using the system as part of their routine operational tasks

Table 8. *Types of personnel receiving training*

As mentioned previously in Figure 7, the training staff are recommended to be a combination of in-house users and consultants. The training is generally commenced during the pilot phase of the ERP project. A common misconception is that the subject matter of ERP training is predominantly technical, but learning the new system is also learning about the new processes and the logic of the underlying flow and integration of information (Esteves, 2014). Finally, the organization must plan the training schedule, which should be synchronized with the rest of the project implementation. The usual mistake during this phase is starting the training too long before the ERP go-live date, causing users to forget what they have learned during the training (Esteves, 2014).

Overall, this chapter has examined various ways in which learning unfolds in organizations and how understanding the process behind knowledge sharing can affect the formation of silos as well as exchange of important information. First, previous research shows how organizational culture can encourage learning and influence the outcome of a project like ERP system implementation. In RQ1, I attempted to answer the question of whether organizational culture affects the level of assimilation and learning in users of ERP systems, and specifically in what ways. Thus far, the study was able to support the proposition that there is a distinct connection to be found between organizational cultures that foster learning, exchange of knowledge and successful assimilation of systems. However, it is unclear to what extent the two factors are correlated and whether there are contextual variations. In other words, the relationship between organizational culture and knowledge assimilation might be influenced by the unique circumstances and characteristics of each organization. Moreover, the intention to learn and use systems are influenced by various factors mentioned in Chapter 2, including individual predisposition to learning, perceived usefulness and social-affective causes. RQ2 in relation to different organizational learning practices will be discussed in Chapter 5.

3. RESEARCH METHODOLOGY

In the third chapter of the paper, I will present the research methodology and the data collection process used in the study. For the purposes of the research questions proposed, *a qualitative research method* is seen as the best. Essentially, semi-structured interviews will be conducted with a subgroup of the case organization, including questions about the background of the respondents, their individual learning profiles as well as their attitudes and opinions about the current role of training of the SAP ERP system and how the current practices could be improved or complemented. The second step consists of performing a text analysis with a qualitative analysis software, during which the transcript data will be coded according to themes.

The results gathered from the text analysis will then be covered in Chapter 4 and 5 together with a formulation of tentative suggestions or a best practices manual from which the organization can benefit, if put into consideration or practice. The prescriptive interview contents are meant to give an overview of the current state of the SAP ERP project along with user's sentiments towards the training received and use of the system. This research will not go into detail about the technical problems, processes or functions related to the system itself.

3.1 Case study design and context

As per Embneyamini and Moghadam (2018), a case study is considered an appropriate method when the researcher has limited control over a given phenomenon while posing the questions “how” or “why”. Moreover, case studies are particularly useful for investigating contemporary questions in natural settings where there has been little to no prior research. Considering the features of the case study method, it is well-suited to the purposes of this research in understanding the individual level assimilation of ERP systems and how that affects overall organizational training practices in the City of Turku (Embneyamini & Moghadam, 2018).

Furthermore, we will begin by presenting the case study context and the evolution of the SAP ERP project in the administration of City of Turku. The following information is gathered from project owners and leaders as well as fellow researchers who have analysed the case organization previously (Huhtaniemi, 2016; Kulmala, 2019). After a brief explanation of the context, we will go through the data collection steps and process that was undertaken to follow the methodology, in detail. Said steps include defining the scope of the interviews and time allocation, as well as respondent profile criteria.

Turku is a city located in the Southwest of Finland with a population of 119.000 habitants and the home place of two universities and a university of applied sciences. The organizational structure of the city is composed by a city council, city government and central administration (Konsernihallinto) which is further divided into five service entities including their committees: Urban environment, education and teaching, culture, children and youth, and sports and vitality service units. The central administration oversees managing and governing the service units as well as management support, service production and integration. The personnel in charge of organizing services work in the central administration whereas service production is handled by a service production unit (see Figure 9.)

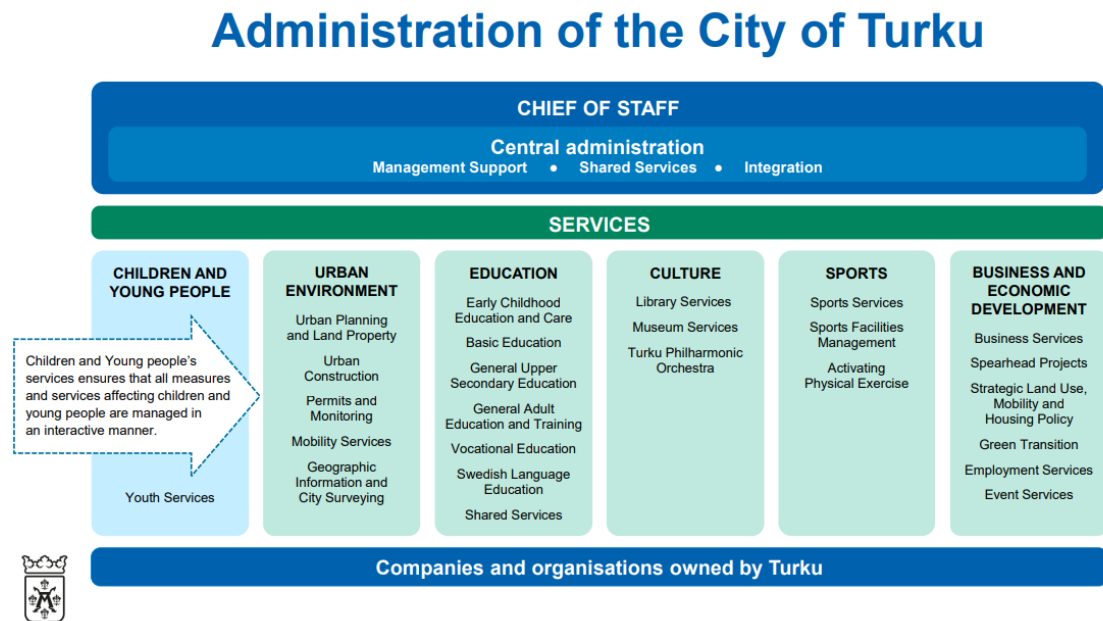


Figure 9. An overview of the organizational structure of the city of Turku.

The central administration is also responsible for IT services unit, which offers communications services to city employees such as user support and system tools. While the organization has been using SAP software products and ecosystem since 2011, the solution package has undergone various updates and additions such as the new ERP module in 2016 (Kulmala. 2019). The IT unit was selected as the pilot group for the initial SAP ERP implementation project. The project was conducted in the entire organization of the city of Turku while the purpose of the IT team was to serve as guide for other units in the implementation. The purpose of the SAP ERP implementation was to provide an integrated order system that enables quick processing of invoices in addition to enabling up-to-date reporting. Essentially, the organization aimed for making the process as cost-efficient as possible and unifying the ordering method of the city of Turku as a whole (Huhtaniemi, 2016).

Over the last years, there have been further actualizations of the SAP ERP (version R/3) system, due to the system becoming technically obsolete and system licence expirations (Kulmala, 2019). To respond to the mentioned changes, the new update version, a cloud-based SAP HANA S/4 solution, would contain significant innovations such as readiness for mobile use as well as data analysis and reporting. The planning for the latest version update project begun in 2018 and was launched in 2021 during COVID-19 and went by the name Aura-hanke (Turun Kaupunki, päätöspöytäkirja, 2023). The Aura project scope was unique as it resulted in one of the largest system implementation projects in the history of Turku and would directly affect all service entities and limited companies under the city body.

Furthermore, the maintenance phase of Turku city's SAP operational control system consists of development and support models. The development model adopted by the city aligns with a multi-municipality approach, meaning the system has been jointly developed with other municipalities. On the other hand, the city of Turku follows a support model that includes a support triangle consisting of primary users, industry professionals and end users. Within this support model, the identification of needs and support occur in parallel, starting from end users and progressing through professional users to primary users. The primary users, in turn, train and guide the professional users, who then transfer the information to end users.

The project was meant to commence in the early 2021 but was delayed a few months until June 2021 (Mäntynen, 2023). Prior to the launch, a kick-off event was held for the management and users of the upcoming SAP HANA S/4. The event, held in an auditorium, amassed 100 attendees, most of whom have never met in person since. Furthermore, the project itself was carried out remotely and training was organized in large groups via video calls due to COVID-19 restrictions. As mentioned previously, the project is acquired in accordance with the municipal cooperation network and thus, is delivered by Kuntien Tiera while the integrator partner is Fujitsu Finland. Fujitsu solution experts were also responsible for training users with the system and provided technical assistance throughout the implementation.

Overall, the Turku's Aura SAP project was to replace the previous SAP system by re-directing the focus from accounting to improved customer service and productized services. In addition to tracking accounting entries and costs, the new version update seeks to better understand customer's needs and what kind of services packages to implement and at what cost. By choosing a cloud-based platform and SaaS-solution, SAP S/4 Hana, the organization can focus on improving their skills to meet customer demand and understanding their own processes, leaving technical expertise to SAP specialists. The payback period for the venture is expected to be three years at the maximum (Tapio Järvenpää, Project Director).

3.2 Data collection: Interviews

As the principal method for data collection, semi-structured interviews were conducted with employees of the case organization. The process for selecting the interviewees was more complex than expected due to the bureaucratic nature of the organization. Throughout the process, close contact was maintained with the project leader of Aura-hanke who then forwarded the research plan to various management level employees. The screening involved holding weekly pitch meetings (see Annex 2.) with key stakeholders and process owners who then gave the approval and provided feedback and suggestions about the progressing of the project. The main purpose of the pitch meetings was to present the research plan in relevant organizational language, convince the receivers of

the utility of conducting the research and gaining permission from superiors to contact the interviewees. It was also important to establish the profile of the participants and a realistic number of the sample size available.

When selecting the interview questions, it was important that they are supported by the literature covered in the Chapter 2. The 11 questions can be found in Appendix 1. Question (1) and (2) inquired about the profile of the users and previous experience with SAP systems. These questions connect to the antecedents affecting individual level learning, especially prior knowledge, and social and affective factors. The third question is related to the different ERP training methods and practices users have taken part in. Questions 4 to 7 will deal with the individual learning styles, and factors such as perceived ease-of-use, perceived usefulness and learning enjoyment influencing system usage. These questions should reflect the elements presented in the TAM model variations and Triadis Framework. Question 8 asks users to address other possible concerns they might have faced while working with SAP, and lastly, questions 9 to 11 explore the communication regarding the ERP training as well as post-implementation support.

3.2.1 Respondent profiling and sample size

The selection of criteria for the interviewees was important, although due to the limited number of personnel that offered to be interviewed, some criteria were considered secondary in nature. First and foremost, respondents were expected to be current users of the newest version of SAP HANA S/4 after its launch in summer 2021. Secondly, differing levels of SAP-knowledge and previous time spent working with the system was of relevance to achieve a more comprehensive perspective of user experiences. Thirdly, a selection of employees from different departments and professional backgrounds ensured diversity in terms of technological knowledge and strengths and weaknesses when operating with a complex software. And finally, the most important selection criterion for the sake of the research was to select users with a distinct learning profile, as in, how the users consider themselves to be as learners as well as their individual needs for training. Despite the last preference being relevant in investigating the factors affecting individual level learning in respondents, its fulfilment was partially arbitrary as no pre-screening was conducted prior to the interviews. The adequate number of

participants was set to six to eight end- or key users, as the common sample size in qualitative studies is suggested to be anywhere between 5 to 50 participants but taking into consideration time constraints (Dwotkin, 2012).

Interviewee	Interview Group	Role Description	Sector	Prior ERP experience
1	1	School secretary	Educational services	End user
2	1	Administrative secretary	Educational services	Key user
3	2	Museum assistant	Cultural services	Key user
4	3	Purveyor	Educational services	Key user

Table 10. Profile of participants

Additionally, one to two higher management level representatives were requested to provide the perspective of how training is approached and to give a more in-depth explanation of educational and knowledge sharing practices in the organization. The selection criteria for the management representative are more ambiguous and the main characteristic that is looked for relates to knowledge around SAP-training and communication. Overall, four employees who matched the criteria were chosen to take part in the interviews together with one management level employee, which is less than initially envisioned (Table 10.). This may pose a potential limitation regarding the amount of data collected being insufficient, however, it is important to note that for qualitative research, a smaller sample size may be justified as it supports the depth case-oriented analysis (Vasileiou et. al., 2018).

3.2.2 Time management

Due to the amount of prior preparation required and the limited schedule from the side of the case organization, the actual interviews took place three to four months after the initial contacting. The selected interviewees were in different departments and locations around

the city, hence, dividing the participants into two smaller groups was deemed most appropriate. To reduce the time required for traveling to each location and the effort it supposes from the employees to partake in the interviews during working hours, the sessions were organized via Microsoft Teams. The time allocated for the interviews was 45 minutes per group. In the end, three interviews were held, the first one with two participants and the other two with one participant each. During Group 1, both participants were asked 11 questions (see Appendix 1.) which left them with 2.25 minutes to respond to each question. Group 2 and Group 3 had a single participant who both used the full 45 minutes. At the start of each interview a small time slot was conserved for a brief introduction from part of the interviewer as well as an explanation to the theme of the interview and for what it was going to be used. Overall, one interview surpassed the total time allotted, yet none of them endured more than 50 minutes.

3.3 Selecting the analysis method

This section involves explaining the text analysis process, which was done by using the transcripts retrieved from the interviews. There has been an increase in the popularity of qualitative methods over quantitative forms, for they provide in-depth knowledge about people's behavioural meaning, such as beliefs, motives, and attitudes. Moreover, qualitative analysis relies on interaction with the object of the study, permitting for the uncovering of serendipitous information. Certain industries and research purposes benefit from this type of method, which produces subjective, unstructured text-based data. In contrast to quantitative research (i.e., statistics), qualitative methods are less technical and allow exploring the phenomenon through intuition and inductive reasoning. Traditionally, analysing qualitative data required scanning through copious amounts of transcripts in search of similarities and connecting themes, which was mostly done manually. While the aim of the process remains the same, companies have since developed software that is designed to automate the "coding" process as well as to search and retrieve data (Wong, 2008).

The question of how to choose the adequate text analysis software resides in research guides and manuals, yet it depends on the researcher which kind of tool best assist in the managing of the data. It is also of importance to select the analysis method and what we

are aiming to extract from the data itself. One favourable approach is by doing *a thematic analysis*. While the thematic analysis (TA) approach has been widely applied in qualitative research for some time, its systematic use and definitions have developed more recently. TA as a qualitative method comprises of identifying, organizing and offering insights into patterns (themes) in a dataset. The focus is less on individual data items and more about finding a meaning and commonalities in shared experiences. Even though multiple patterns could arise across any dataset, the purpose of thematic analysis is to identify those relevant to respond a particular research question (Braun and Clarke, 2012).

Along with other, more established qualitative methods, thematic analysis presents a unique set of advantages. First, it offers flexibility in allowing researchers to approach data from various angles; one can focus on comprehensive data analysis or examine more specific parts of the raw data. Second, it allows for interpretations beyond explicit meanings and uncovering of more hidden assumptions and underlying concepts. Third, TA is a particularly beneficial tool for newcomers by providing a systematic, structured entry-point to analysis without the need to familiarize with complex theories. Thus, due to its user-friendly nature, it is also accessible to a wide array of users and ideal for researchers engaged in multi-method studies or participatory research projects, without require expertise in qualitative research (Braun and Clarke, 2012).

3.4 Analysis tool

The next step of the methodology process involved selecting the proper text analysis software for qualitative analysis. Computer software packages for qualitative research are expected to support the researcher with the arrangements of contents such as interview transcripts to gain insights from the textual data. In order to transform the raw information into identifiable patterns, a systematic process of coding and categorizing is needed (Wong, 2008). It is no surprise that there are a wide range of different software technology available, such as SPSS (the Statistical Package for Social Sciences), NVivo, Leximancer and even Excel, as each serve their purpose in making the researcher's process easier (Sotiriadou, 2014; Wong, 2008). It is important to mention that while the programme accelerates the process of grouping and retrieving data, the users are in command of the analysis; they need to synthesize the data and draw meaning from it (Wong, 2008).

In order to determine which text analysis software to choose for the purpose of this study, we explored popular research publication sites (ResearchGate etc.) and networking forums to gain more insight into programs that fellow researchers are using. Adding to the previously mentioned list of software packages, the most recommended tools for thematic analysis by researchers were NVivo, MAXQDA and Atlas.ti. Considering it would require more time to cover the similarities and difference between these three systems, we have decided to proceed with the NVivo Software package. The reason for selecting NVivo was due to it being widely used by researchers to study social phenomena and because NVivo allows performing data analysis without the need for much technical expertise (Sotiriadou, 2014). In peer reviews, NVivo is claimed to bring the researcher closer to the data, focusing on deriving meaning from it by means of manual “coding”. Moreover, NVivo has several features that assist the process of finding relationships between bulks of data as themes emerge, such as framework matrix, word clouds and project maps (Dhakal, 2022).

4. ANALYSIS AND RESULTS

4.1 Analysis using NVivo

4.4.1 Creating a project and coding in NVivo

The transcript files were first imported from Microsoft Teams into the NVivo software where the researcher initiates a new *project*. NVivo allows uploading several types of documents such as text, audio and video files and photos, and has a section called “externals” for proxy documents or data sources which cannot be imported (i.e., books or movies). After importing the text files (interview transcripts), they were named, *Interview 1*, *Interview 2* and *Interview 3*, respectively. It is worth noting, that *Interview 1* contained the responses from the joint interview with two users, while the other files consisted of individual interviews. The contents were then scanned and browsed through several times

to detect initial patterns and to take mental notes. After familiarizing myself with the material, I proceeded with the thematic categorizing which meant highlighting and copying parts of the text to create themes or “codes” for a variety of categories. The themes created were as follows:

Themes	Files	Codes	Colour mark	Comment
Background	3	13		
Communication	3	21		
Current SAP training practices	3	49		
Feedback	3	19		
Issues related to SAP training	3	22		
Language in training	2	8		
Motivation to use SAP	2	7	—	
Previous experience with SAP	3	13		
Resources	2	10	—	
SAP roles	2	7		
SAP understanding and reputation	3	11		
SAP usage	3	26		
Solutions for training	3	17		
Time management	2	9		
User Learning profiles	3	21		
User support	3	12		

Figure 11. Themes created in NVivo.

In Figure 11, the files column indicates the source documents that the coded items are connected to, and the codes column reflects the number of coded items per category. The colour mark is applied to highlight the different categories.

4.4.2 Reorganizing codes and cluster analysis

After the first “coding” attempt, I investigated the separate coded themes closely to see if we could encounter any commonalities between certain themes or if some categories seemed nonessential regarding the analysis. Initially, 16 items (codes) were created from the data, most items depending on 2-3 of the source transcripts. After preselection, it was decided that it was best to organize the codes as sub themes under larger main themes that reflected the themes addressed in the literature review. Some label names were changed

and correlated categories were assigned under the main themes. Finally, seven codes were created as main themes: User profile, User engagement and motivation, SAP Training practices, Language and communication, Issues and Challenges, Feedback and improvement and User support.

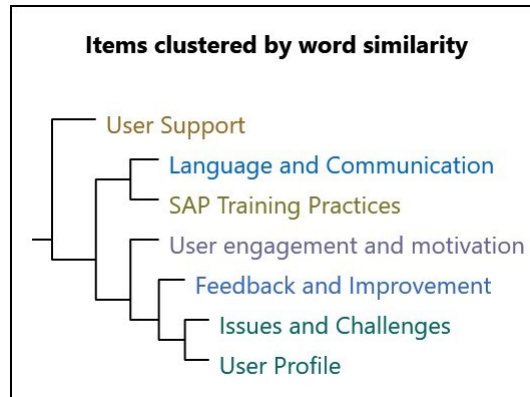
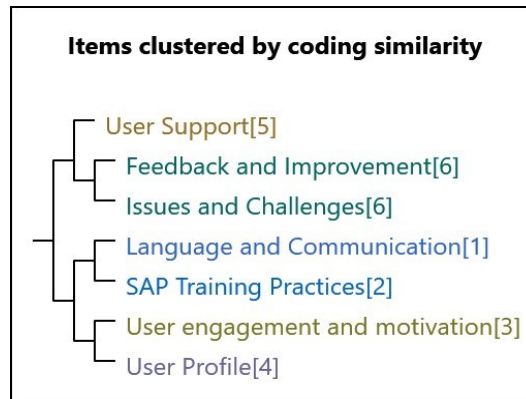


Figure 12. Cluster analysis by word similarity

With the newly created main themes, we performed a cluster analysis in NVivo, and used word similarity as the reference point in creating the clusters (see Figure 12.). In the first clustering example we set the number of clusters to six and selected Pearson's correlation coefficient as the similarity metric to create the analysis diagram. Stop words are not included in the similarity measure. Practically, what the NVivo programme measures here is the similarity index between each pair of words appearing in the codes selected; the codes with a higher degree of word similarity are group into the same cluster while the more different the codes are in terms of code similarity, the further apart they are placed in the branching diagram. By investigating this diagram, we can observe that the wordings used in "Issues and Challenges" and "User Profile" categories are the most similar, followed by "Feedback and Improvement". The first cluster analysis does not necessarily offer us any meaning information about the source data, so we will proceed to run a second cluster analysis with different parameters.



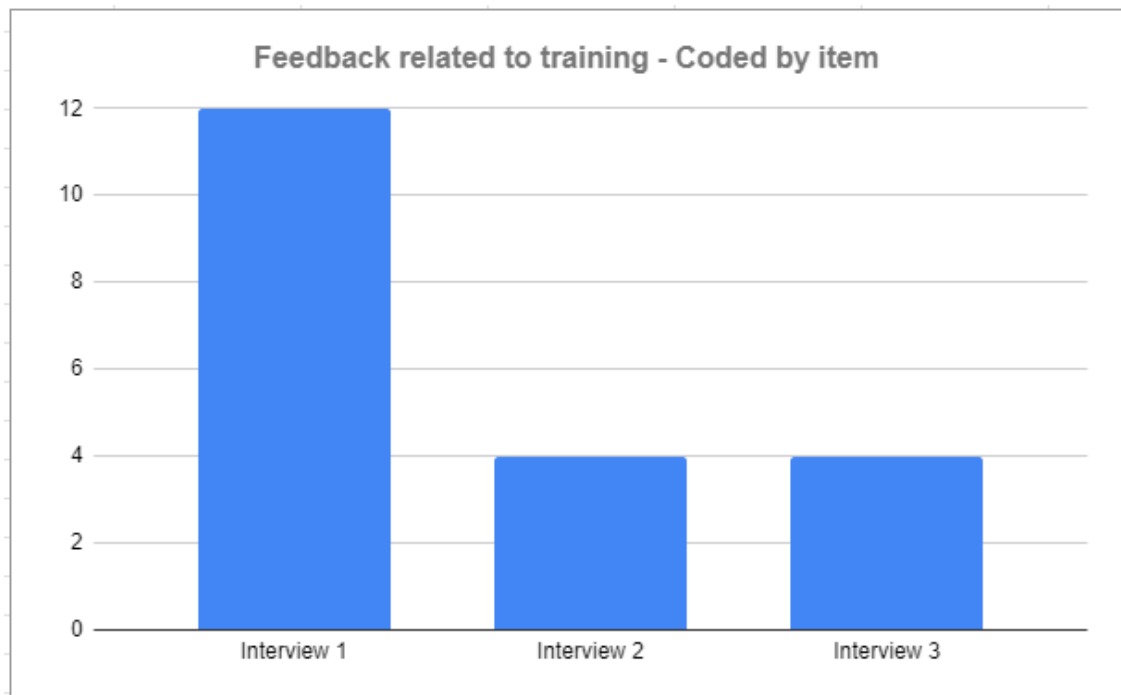


Figure 14. Bar chart exhibiting the amount of feedback provided by each interview group.

4.4.3 Project maps

Another function available on the NVivo platform is the creation of project or mind maps. A project map, for example, is a representation of the different items present in a project, which can be used to explore and draw connections between data points. In other words, it visualizes the contents of the analysis project, such as themes and subthemes (see Figure 15.).

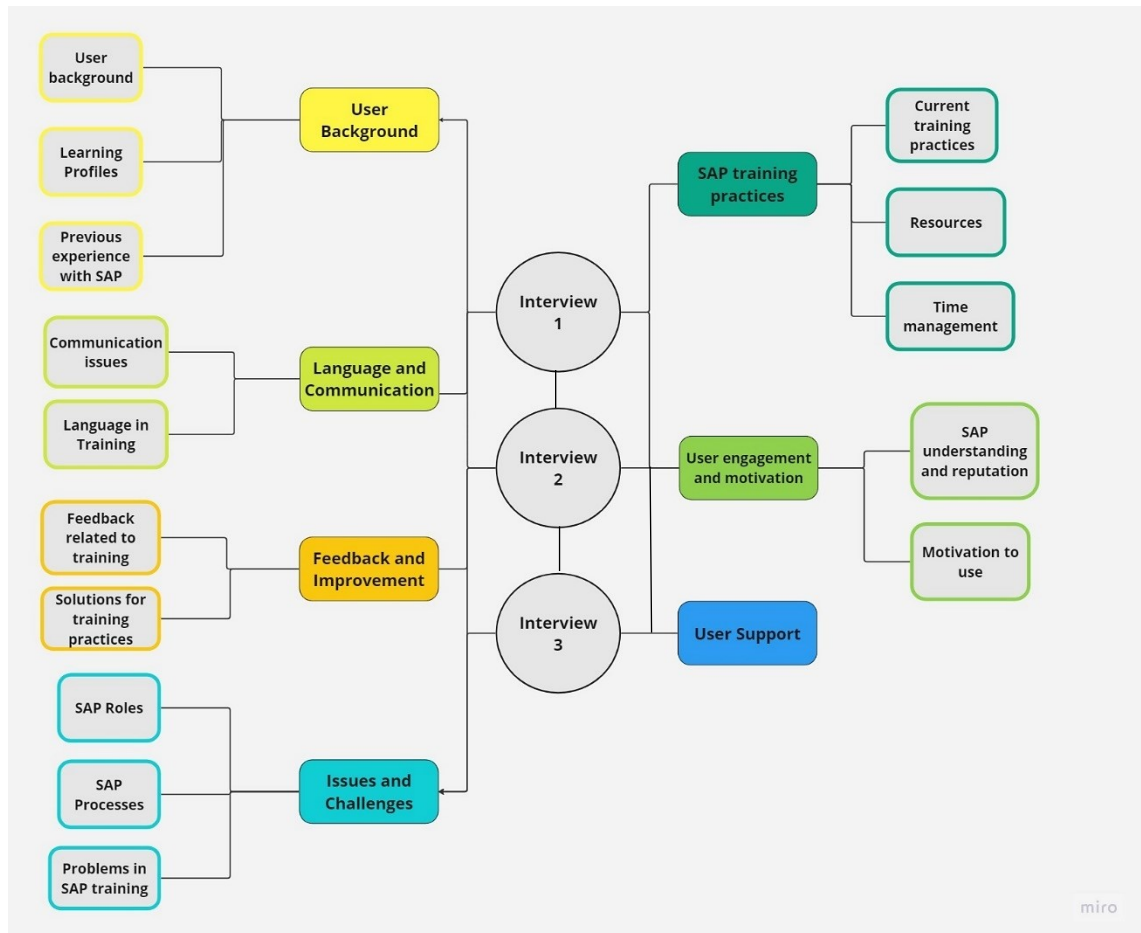


Figure 15. NVivo Project map redesigned with themes and subthemes.

In the current map we can see the seven main categories and 15 sub-categories: User background, Learning Profiles, Previous experience with SAP, Communication issues, Language in Training, Feedback related to training, Solutions for training practices, SAP Roles, SAP Processes, Problems in SAP training, Current training practices, Resources, Time management, SAP understanding and reputation and Motivation to use. The above project map is limited in showing the connections between the interview sources as it only displays the hierarchy between the main nodes and sub themes. For that reason, we can create a second visualization map, which shows the different topics are connected to each interview.

The following mind map (see Figure 16.) contains 15 nodes which represent the topics discussed during the interviews. The nodes are linked to three of the interview files

through a connector. We can observe that some of the nodes are only connected to two of the interviews while others are connected to all of them. This means that not all the

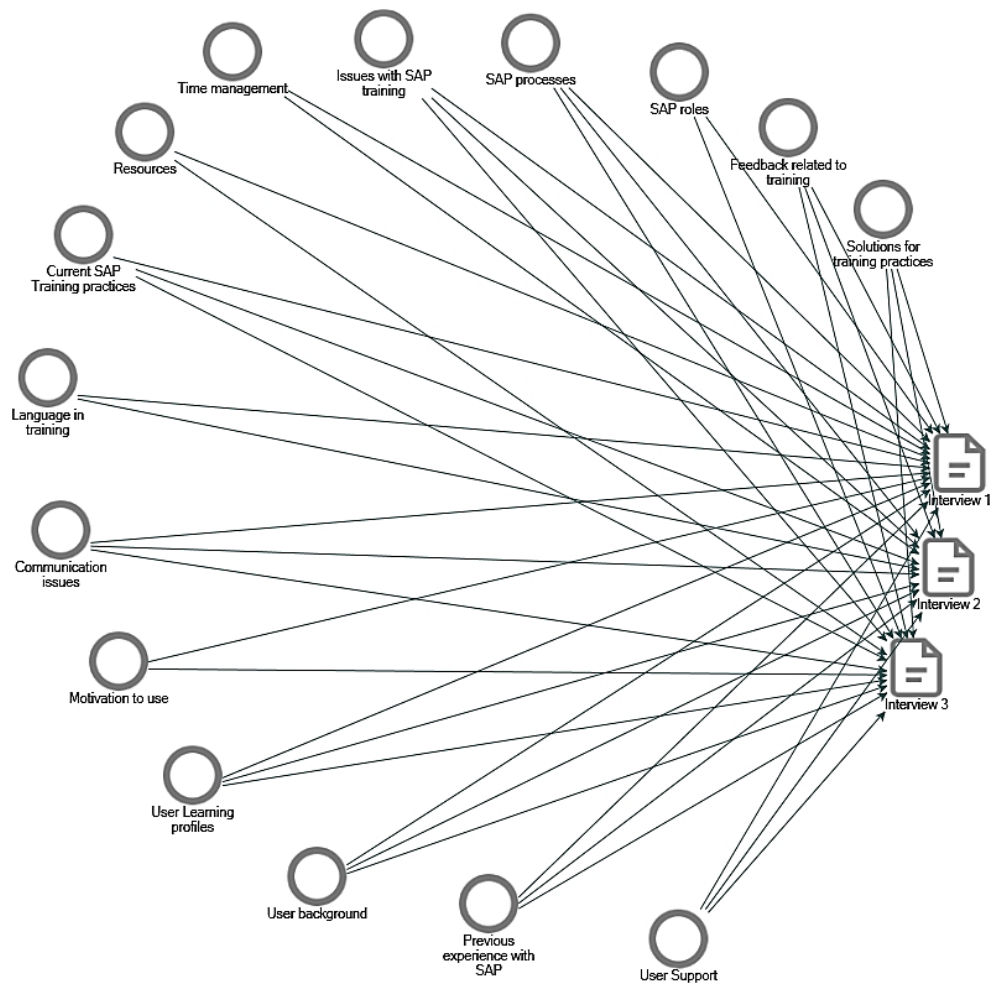


Figure 16. A visualization of the subthemes and their connections to the interview files

respondents provided comments on all the chosen topics, and therefore, I was able to retrieve less data on those specific themes.

4.4.4 Word frequency

Next, a word frequency query was performed on the coded themes to gain more understanding about repeating topics (Figure 17). NVivo has a built-in function for word frequency display, to which we set 70 most used word across all 15 selected items (codes). We set the matching criteria to include stemmed words (“talking”) and removed stop

words to filter out commonly used language or filler words. The minimum length of the word was set to 5 characters considering that Finnish words are lengthier in nature. After specifying the criteria, we ran the query in the software and attained a list of words meeting the criteria. The summary tab shows the word, its length in characters, the count for times of appearance and the weighted percentage.

Word	Length	Count	▼ Weighted Percentage (%)	Similar Words
avain	5	22	0.46	avain
ihmiset	7	18	0.37	ihmiset
ohjeet	6	15	0.31	ohjeet
ohjelma	7	15	0.31	ohjelma
ongelma	7	14	0.29	ongelma
koulusihteeri	13	12	0.25	koulusihteeri
sapin	5	11	0.23	sapin
kaupunki	8	9	0.19	kaupunki
käyttäjä	8	9	0.19	käyttäjä
koulutuksia	11	8	0.17	koulutuksia

Figure 17. Table containing a list of 10 most frequently appearing words in the data.

Due to the text content being in the Finnish language, the wording could not be shown in English. However, we can see that the top 10 words repeated by the interviewees were (as translated): key (user), people, instructions, system, problem, school secretary, SAP, city, user and training. Surprisingly, terms like *learning* and *support* appeared only further down the list and for that matter were not included in the table above. One possible explanation to this could be that while interviewees did not use the exact terms such as “learning”, one could contextually link the subject being discussed to be about training and different learning practices.

The word cloud presented in Figure 18 illustrates the most frequently utilized words or terms, with larger sizes indicating higher frequency of usage and smaller sizes indicating lower recurrence. In comparison, the word frequency table and the word cloud contain slightly different terminology. The top 4 words appear to be the same on both lists, however, the word cloud presents terms such as “easier”, “new” and “invoices”. All in all, the word cloud query provides a broader overview on the topics discussed in the

interviews as the visual display is more readable. However, it is difficult to conclude whether the terms are representative of the overall contents discussed in the data collection. At first glance the intentions of the research are visible from word cloud analysis, however, the selection does not offer any deeper understanding or novel insights about the content of the interviews.

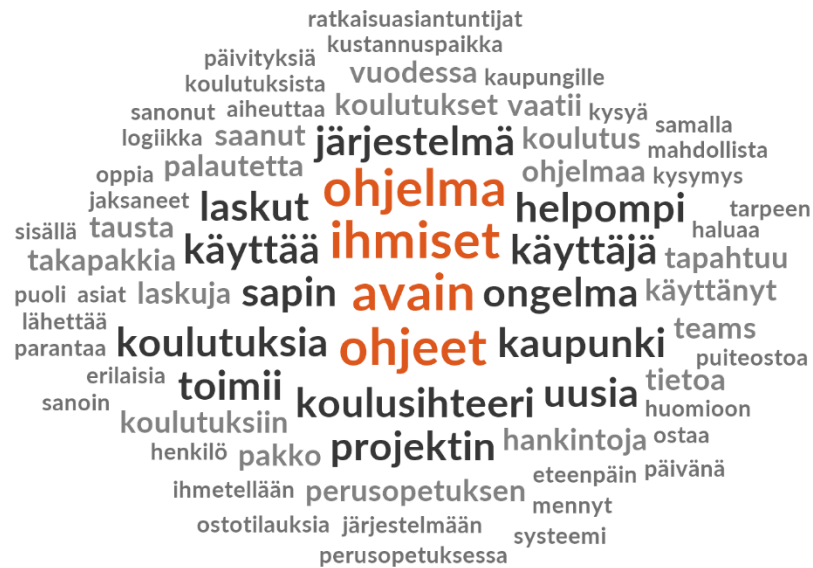


Figure 18. A word cloud containing words used by number of appearances.

4.2 Results

After finalizing the coding process and thematic analysis, we will proceed to present the results. The findings will be presented according to the themes mentioned in section 3 and some citations from interviewees will be used to link the contents of the interviews with the concepts mentioned in the literature review. A total of six themes were chosen to represent the findings from the interviews and the analysis, with related sub-themes. It should be mentioned that one of the themes included in the qualitative analysis, “Issues and Challenges”, will be exempt from the result section as I concluded the related contents were already covered in the other themes and thus, would be too repetitive. Overall, the discussions with the focus interviews align with the themes I have explored during the literature review and offer some valuable insights about the current context of the SAP

ERP training in the City of Turku. Some observations can also be made about the attitudes of the users in general about the project as they addressed the problems related to the use of SAP and the lack of proper management. Although these points were not directly related to my research, they can offer some important knowledge to the organization.

4.1 User background and profile

Three out of four of the respondents were key or primary users of SAP ERP and were in general more knowledgeable about the processes related to SAP. One respondent, a school secretary, declared themselves to be less familiar with the system and relied often upon the key user's support. Three respondents worked in the educational sector, although in different institutions, and one as part of the cultural services unit (see Chapter 3.2.1).

“When this new SAP program arrived, I was working as a key user in basic education. That is, as support for our basic education school secretaries.”
(Interviewee 1)

“Regarding SAP, I have a bit of an unusual background in the sense that I have been managing SAP user rights at Nokia for more than 10 years, so I am familiar with the system. I have been in my current role as a museum assistant for about six and a half years” (Interviewee 3)

” I am a construction technician, machine, and metal technical designer. In 2008, I moved to the city of Turku, where the first SAP system was in use, so I have been dealing with procurement for several years. Then in 2018, I transferred to the Turku Vocational Institute.” (Interviewee 4)

Regarding whether users had previous experience with SAP ERP and how it influences learning of the system, all respondent acknowledged that it played an important role. Generally, repetition of tasks using the SAP system contributed to a better assimilation of the knowledge received during training. According to some respondents, having worked also with previous versions and modules of the SAP body helped in using SAP, as functionalities between modules did not change all that much. Nevertheless, one respondent from Interview 1 who did not have a strong SAP background reasoned, that

there were some advantages in not having used older versions of SAP prior to the system update.

“Typically, a new system brings upon some resistance to change. Luckily, I did not learn to use the previous SAP system, so I did not have to carry the burden of knowing how the old system worked and speculating about whether we were going backwards” (Interviewee 2)

Moreover, one of the most important aspects of the study was to gain an understanding of how users learn and receive information. This factor is largely connected to the material discussed in the literature review and respondents provided various connecting as well as some conflicting insights.

“Personally, I prefer a larger, general presentation to the overall topic, after which I can practice on my own. I like to have a physical copy of the instructions next to me to which I can rely upon at first. After learning individually, I see it as important to discuss the steps we have taken in a group-setting.” (Interviewee 2)

Another respondent clarified:

“Sometimes it takes another person or colleague to explain it in their own words for the others to realize how a specific task must be done. Repetition is also important for building trust in using the system correctly.” (Interviewee 1)

It appears that a combination of learning both individually and collectively was the most popular approach. Some respondents emphasized that learning by doing was more valuable to immediately put into practice the knowledge they have acquired which was followed by sharing the learned tacit knowledge with a group. Others suggested that being shown what to do was the most effective and ensure no critical mistakes were made in the process. This point was further emphasized by Interviewee 4 who explained that it only takes one mistake for the whole process to stagnate. Another important observation is the level of technical understanding or IT-proficiency of the users in training and how it affected the effectiveness of the training. Although three out of four of the participants in this study declared to have substantial knowledge about IT and SAP systems, it was

acknowledged that some users were more able to use the system than others who were less technically minded.

“If I could decide the profile of the people who received training for these roles, it would be IT skills.” (Interviewee 4)

4.2 User engagement and Motivation

The second theme gathered from the analysis is centred on how users perceive the ease-of-use of the SAP system and their intentions to use it. When asked about their strengths and weaknesses in using or learning about the system, participants underline that there is a certain logic behind the process of using SAP and once it is grasped, it becomes easier to understand. Despite the logical procession, the system receives recurrent feedback about its lack of user-friendliness and bureaucratic nature:

“Having understood the core of the system’s functionalities over the years, I have noticed how the bureaucratic nature of the organization is only accentuated in SAP and in a lot of ways, the system is not the most user friendly” (Interviewee 3)

“The problem I see with users having difficulties in engaging with the system is that it has a generally bad reputation in our department. There have been times when certain clients have refused to deliver or do transactions with us because of delays in invoice reporting inflicted by the program” (Interviewee 3)

All four respondents agreed that the system holds a poor reputation which has partially affected the intention to use from part of the city employees. Interviewee 3 adds that they believe SAP “is mere business” for the main organization and the way it often works is that every few years a new version update is developed, and once problems begin to arise, another update is implemented resulting in more investments and spending. It is difficult to conclude whether the negative image and resistance towards the system is a result of the systems usability or possible organizational barriers and the overall culture.

Respondents were also inquired about what motivates them to continue learning about the SAP system. The most prevalent response from all four participants was that their work requires using the system and there were no alternatives. However, behind the critical attitude resided a more practical reason:

“The purpose of the system is to help users manage their tasks faster and more efficiently and I think that urges employees to use and understand the system thoroughly. While using SAP is an obligation for the organization, I found motivation in learning it as well as possible, because I knew it would ease my workload and provide some extra space to work on other tasks, the better I learn how to manage the system.” (Interviewee 2)

Moreover, it appears that handling the logical sequences of the SAP ERP process is of critical importance and if not understood sufficiently it can become burdensome to use. One respondent argues that “learning how to adapt to the current situation is integral and I strongly believe that a certain type of personality, evident interest and desire to understand SAP ERP are needed for one to perceive the system to be useful or easy to use” (Interviewee 1). From this section of the analysis, we can see some commonalities between the concepts of the Technology Acceptance Model (chapter 2.3) such as ease of use, perceived usefulness and intention to use and the responses of the study participants regarding their attitudes toward the system. The previous point will be further elaborated in the discussion section.

4.3 Language and Communication

Insights about the role and importance of language as well as communication in general were brought up during the interviews. One of the interview questions (see Annex 1.) touched upon the communication around the SAP project and whether users had perceived any shortcomings in how things were communicated to them. Although the role of language in training was not explicitly discussed in the study or literature review, it is reasonable to believe that it influences on how successful the training is perceived.

“From my experience, having instructed end users in using SAP, I often receive positive feedback for using common and less technical language in my trainings. The terminology used in SAP is intended to sound fancy and smart but oftentimes it detracts from understanding the meaning behind the functions. When the language is made to fit the everyday organizational language and real scenarios are used as examples, it is much more likely that the concepts sink in” (Interviewee 1)

Another respondent further emphasized that it is essential to adapt the language used in training to the receiving audience. This means that vocabulary should reflect, not only the language used in the organization but also the terminology of their specific areas of work and technical level of the employees. The use of borrowed words from English and anglicisms may distract users from understanding elemental things or it could result in misunderstandings depending on who received the training. Overall, participants stress on providing uniform, easy-to-understand terminology that reflects their subject matter as well as possible. A suggestion for a glossary or a list of common words was given in order to minimize this risk.

In terms of project communication, respondents had mainly mixed to negative feelings about the topic. Three out of four participants claimed that higher management was more focused on having their needs met and set the pace for the project while the employees doing the procurement and key users had little influence on how things proceed. Despite holding a few larger meetings with key members from the procurement team, bottom-to-top feedback was not taken seriously by project leaders. Moreover, employees that were not part of any procurement or SAP related email lists or groups too often failed to receive updates that concerned their work.

“There should be a policy in place in which higher management ensures that those employees who need to operate with SAP in any way are automatically included in the project mailing list. On top of that, it would be useful to have an automatic email sent out for when anything new happens with SAP that users should be aware of.” (Interviewee 2)

Participants in the Interview group 1 acknowledge that the internal communication of the organisation is at fault and that flow of information from top-to-bottom levels should be improved. Transparency of communication across departments, units and workflows is essential in ensuring a successful implementation of an ERP project. The key user from Group 2 joined the criticism above but with a slightly more neutral attitude; they believe that communication had taken place, yet it often came in too late at a stage where a large group of people were informed, about being required to use the system within a short timeline.

“When the news first came in about the new system update, it was complicated. Many people that should have did not receive invites to training due to the gaps in the mailing lists and missed the instruction that one had to sign up to a training on our intra- website. Even myself as a key user that had to train others, I only received the news two days before during a kick-off meeting. These decisions clearly come from a higher level it created a general feeling that our opinions were not valued as they were interpreted as resistance.” (Interviewee 3)

Contrary to the others, the participant from the last interview group (Group 4) believed that internal communication was sufficient, and that the central administration did their best, but the problems arose due to the subject matter experts from the integrators side (Fujitsu). While all four participants had differing views about how project communication is managed, there were seeming shortfalls in what and to whom the important information should be delivered.

4.4 SAP Training practices

The current training practices as part of the SAP HANA S/4 implementation received mixed opinions. The elements discussed during the interviews related to the methods and practices used as part of the training, as well as some aspects related to time and resource allocation. This theme gathered the largest amount of material and commentary and thus, we will divide the topic into smaller sub-sections.

4.5.1 Current training practices

First, respondents were inquired about the training they took part in during the SAP HANA S/4 implementation and asked about specific practices that the organization had offered. According to answers, the initial training had been organized in the form of online education targeted for large groups regardless of the department or service unit. Subsequently, smaller, role or department specific training sessions were conducted internally with key users, who gave instructions. Interviewee 2, who was the only user without previous background with SAP described that they received individual training from other colleagues who were key users.

“What happened was that us school assistants and educational sector employees begun to organize our own meetings which happened on an ad-hoc basis or when there was need for further clarification. I was happy with those more targeted training sessions with (...) who explained the steps in the procurement process step by step.” (Interviewee 2)

The unofficial trainings were not particularly structured and consisted more of users reporting specific problems with the system. This appeared to be a form of user support, indicating that no structured or systematic post-implementation support was offered. Essentially, key users were given the responsibility to sell the system to the end users. In addition to the training program over Microsoft teams, users had access to SAP Enable Now, an in-application learning platform with a variety of learning materials and educational videos which explained processes step by step. Users were urged to download the PDF-file instructions from the platform and recur to them when needed. Overall, participants were content with the existence of the Enable now learning platform but had fewer positive sentiments towards organization of the training in general:

“When I was hired in the procurement team, I partook in some training sessions. The role description was “procurement operator” but it soon became clear to me that they were expecting me to take the role of a trainer as well. This happened to many of us, and they (management) did not take into consideration that we had to do that in addition to other work tasks. It was poorly managed” (Interviewee 3)

It was agreed that a better approach would have been to have a person whose sole responsibility was training the team and that they would not work on other workflows simultaneously. During pre-implementation, most employees were end-users and were new to the system. Participants justified the availability of Microsoft Teams as a valuable tool during the training phase and described it making their job considerably easier.

“The main issue I had with training was the initial mass sessions were very disorganized. At times, there could be a 100 people online and for those who had never heard of SAP before were utterly lost. For user like me, who had previous experience with SAP, it was more manageable, but it resulted in us listening through the trainings after which we had to hold our own trainings to the end users.” (Interviewee 3)

Another problem that came apparent during the training was that there were many differences within the organization and different departments had their own practices. In hindsight, there should have been more structure to the training practices, and they should have been more targeted to the specific needs of the users. Also, the organization should opt for separate trainings for key and end-users as well as different service units. Another participant disclosed that their training sessions were led by an external consultant from Fujitsu (the integrator) and after some months they disappeared, and the team was left on their own.

4.5.2 Time allocation and resources

Moreover, participants criticized the timing of the trainings. The system was officially launched during the month of June, yet it coincided with the holiday period for most employees which resulted in forgetting the knowledge acquired the months before. Another believed that the delay in production on the SAP system resulted in the system not being equipped for use by the time the program was launched, and many modifications were made since.

“Two days before the kick-off event I received a message from higher management that I was assigned to be a trainer for the new users of SAP HANA.

Even my boss was not communicated about this decision. While I was excited to take on the task, I had no influence in when it should take place and it ended up happening when I was supposed to be on holidays.” (Interviewee 3)

Most blamed the exceeding of the schedule to management’s motivation to cut on costs and it was often used as justification. Moreover, the organization’s choice to implement the most standard version of the SAP system received resistance from the educational sector employees who felt the system did not sufficiently support their work and lacked specialized functions. The common argument was that the results of the cost reduction eventually generated more work for the end users as they needed to navigate through complaints about delayed invoices for months after the launch of the system.

“Ironically enough, the large-scale savings that the organization predicted did not come into fruition as it created a lot of additional work and over 40.000 invoices were over-due. A strange system considering they had the taxpayers in mind.” (Interviewee 4)

4.5 Feedback and improvement

In this section, respondents were given the opportunity to provide any additional feedback, either related to the SAP training they received or the system’s usability. Respondents from Group 1 argued, that instead of improving efficiency and making processes easier, the new version update was a setback. The most relevant issue that was mentioned by all four respondents was the process of inputting the correct cost centre when reporting an invoice on SAP. Due to a flaw in the system’s user interface, the employees claimed that finding and writing down the cost centre for each specific product was laborious and inconvenient. We will not go further into detail to discuss the functions and processes of the SAP S/4 HANA as it is not exactly related to objectives of the research; yet, as the issue was frequently raised during the interviews, it was deemed relevant. The criticism could be indicative of the employees’ complaints not being heard by the management which is partly related to deficient project communication.

“I felt like us end users were not being listened to by the top management about issues arising with the system use. Especially in the beginning, this negatively affected the employee morale.” (Interviewee 1)

Some made a reference to the feedback questionnaires that were sent to the educational service unit employees (see Chapter 1.1) in Spring 2022. The file included an array of comments that were compiled into different categories about how the new system affected the employees’ work. Users felt that their feedback was not taken seriously, and while the situation has somewhat improved, some shortcomings are yet to be addressed. Regarding the evaluation of SAP training, one employee noted that participants “were requested to provide feedback, but it often felt useless as no changes were made”. One person suspected that the training assessments were being directly forwarded to Fujitsu solutions experts and thus, were not managed by the organization who were not officially in charge of the training.

“I was part of those feedback session regarding training, and many people complained about the lack of pedagogical validity and knowledge from part of the organizers.” (Interviewee 3)

Additionally, participants were asked about what they would like to change about the methods of training or learning practices. One suggestion was introducing a service design methodology or practice to enhance cooperation between users, stakeholders and the service provider. According to Steen et. al. (2011), service design places the user into the centre of the process by breaking services into sections and adapting adjusted solutions that meet user needs based on different contexts.

Moreover, the respondents agreed that internal communication about the new SAP system should be improved, and the profile of end users receiving training should be predetermined more carefully. One respondent reasoned that the role as well as area of work of the employees should be considered when deciding whether they needed to participate in the training sessions instead of offering training sessions that are open for everyone. Different areas of the organization have different needs, which calls for job-specific training. Likewise, systematic email invitations to users could increase efficiency overall, as people who do not work in procurement can disregard the sessions and direct

attention to other workflows. Respondent from Group 3 acknowledged not being personally affected by the current training practices, however, keeping in mind the school secretaries' dependence on the system, regular refresher training should be arranged.

“In the current era of robotics and AI, the organization could develop and implement such solutions to oversee the personnel creating invoices, and thus, and determine the need for training based on that behavioural model.” (Interviewee 4)

4.6 User Support

Based on the interview question about what user support measures does the organization offer for the end users, respondents collectively asserted that more systematic support needs to be provided. On the one hand, were problems to arise, most users feel that they have someone to turn to, whether it is their unit's key user or another colleague. On the other hand, the key users are relied upon too heavily for guidance. Teams should be provided with written instructions on how to navigate through the most commonly occurring problems. Currently, key users may receive numerous calls during their workday from other end users who are struggling with similar issues, when it would be timesaving to have a systematic process in place. Similarly, any version updates about the SAP system should be communicated on the Intra page, where the information is easily available for everyone.

On the same note, another interviewee proposed that an enhanced communication with the Fujitsu solution experts should be established. This would benefit the key users who have been overloaded with extra responsibilities and end users facing problems would be directed to the SAP specialists who would operate as the main support channel. Lastly, a dictionary or glossary with the most used SAP terminology, accompanied by definitions, was deemed useful by one of the participants. The reasoning was that some issues have been arising from users employing different terms interchangeably or using more than one label for the same feature, creating confusion between different organizational units.

All in all, the findings indicate that users who have previous experience with SAP ERP have an advantage in learning the system, as repetition of tasks and familiarity with

previous versions and modules contribute to better assimilation of knowledge. However, one participant without a strong background in SAP found advantages in not having used older versions prior to the system update. User engagement and motivation were also examined, and it was found that the perceived ease-of-use of the SAP system and its reputation within the organization affect users' intentions to use the system. Users expressed dissatisfaction with the system's user-friendliness and bureaucratic nature, and its negative reputation impacted employees' motivation to learn and use the system. Participants emphasized the need for clear and understandable language during training sessions, and suggested that training should be tailored to the specific needs and technical levels of users. The study also found shortcomings in project communication and training practices. Participants felt that communication from top management was lacking and that feedback from end users was not taken seriously. Training sessions were often disorganized and poorly timed, leading to difficulties in learning and using the system. Participants suggested improvements such as better communication, targeted and structured training, and the provision of written instructions and support materials.

5. DISCUSSION AND PROPOSAL FOR LEARNING GUIDELINES

The conducted interviews offered some valuable observations about participants' experiences with SAP training and usage. During the sessions, we touched upon various themes related to training, learning preferences, system usage and overall engagement. As mentioned previously, certain topics were discussed more in-depth than others, and occasionally the discussion diverted to topics outside the scope of research. In order to ensure the relevancy of the results regarding our initial research problem, we will proceed by outlining the most important findings gained from the qualitative research and connect them with the concepts gathered from literature.

First, understanding user demographics and roles when designing system training shows to be of importance. Previous research suggests that the context (i.e., personality type,

social environment) in which users operate can influence their absorptive capacity during ERP training and how easy for them it is to use the system. As for the results of the qualitative research, it is difficult to conclude whether there were clear differences in learning based on user background, as three out of four participants of the case study were key users. While one end user took part in the interviews, it would have been desirable to include employees who worked in different SAP roles and had less previous knowledge of SAP. The examination of personality traits in respondents was excluded from the qualitative analysis. Moreover, participants discussed how familiarity with older versions or modules of SAP may play a role in how effective the training is on an individual level, which can impact the learning curve and ease of adoption. Another relevant finding was related to the prior technical ability of users. While this point was not extensively covered in the literature review, interview participants agreed that the level of technical proficiency affected user engagement and ease of use of the system and thus, should be considered part of training design.

Second, the application of training practices that follow the learning style and preferences of the users should be more thoroughly evaluated. While the case organization offered various means for collective and individual level training (i.e., virtual classroom sessions, learning platform, educational videos), users complained about the absence of more targeted training, which would consider the role, level expertise and learning preferences as the basis for designing the training methods. In terms of learning preferences, some participants emphasized the value of both individual and collective learning, indicating a blended learning approach. More so, learning by doing and sharing tacit knowledge within a group setting were highlighted as effective methods. Reflecting on theory-based learning cycles, such as the Experiential learning cycle, may be one way to guide organizations in understanding learning processes as well as individual learning styles (see 2.3). After all, the better users assimilate knowledge about systems through learning, the more efficient they will be at using them.

Third, the relation between user engagement and motivation was addressed, both when reviewing previous academic literature and during the interviews. The main sentiment among participants was that their motivation to use the SAP system is directly correlated with managing work. More specifically, there were no alternatives as system usage is imposed by the employer, and without it their tasks could not be carried out. While some

reasoned that properly understanding the logical structure of the SAP workflow made them more efficient at work, others contended its lack of user-friendliness and bureaucratic nature. In addition to perceived system usefulness, respondents agreed that the system's poor reputation may have affected the intention to use of SAP among employees. This notion is connected to the factors interacting in the Technology Acceptance model (see 2.3.1) and confirms the fulfilment of user motivation as well as intention to use is influenced by perceived usefulness and perceived ease of use.

Fourth, in Chapters 4.4 we explored project communication related to the SAP S/4 HANA implementation process. Respondents mentioned the lack of transparent communication, especially from top management, as a hindering factor in user's learning and system engagement. Key users were too often relied on for learning support, communicating updates to other users as well as responding to doubts that should have been addressed from the top-down. The need for more timely and targeted communication was emphasized, including a better understanding of user roles and task specifications. Another aspect of communication was the language used in trainings. Interviewees explained that terminology should be less technical and more adapted to the overall organizational language as well as role specific. The aspect of language was not specifically covered in the literature review; however, it can be seen having an intrinsic role in the knowledge creation and transfer process in Chapter 2.2.1. According to researchers, individual level organizational learning is best achieved through collective practices and by ensuring that the knowledge expressed is interpretable by the receivers.

Next, we have defined a list of action points that the organization can implement and use as guidelines for improving SAP ERP training and learning in the future. The following proposal is based on the knowledge acquired from this research as well as suggestions provided by respondents:

1. **Tailored training programs:** The organization should create training programs that are tailored to the specific needs of different user groups, considering their roles and prior SAP experience. Offering different training tracks for beginners and advances users would ensure that training aligns with their knowledge levels. An effective way to achieve this is by sending out a self-assessment form prior to training and forming focus groups based on results.

2. **Diverse learning approaches and resources:** Implementing a blended learning approach that combines various teaching methods, including video tutorials, hands-on exercises, group discussions and instructional manuals. Providing a forum for FAQs, for users to reference as needed and maintain an updated library of resources that are accessible at any time. For instance, Scribehow is a service platform that offers process walkthroughs and documentation for training purposes.
3. **Improved communication plan:** The internal project communication plan should be reviewed and establish a clear and open communication channel between management, end-users and solution experts. This includes ensuring that updates, changes, and important information regarding SAP are communicated in a timely manner and avoids the forming of information silos.
4. **Systematic feedback process:** Developing a structured procedure for delivering and handling feedback, both on training sessions and the SAP system. Those in charge of the process should regularly review and act upon user feedback to ensure continuous improvement and to build trust and credibility for the organization.
5. **Dedicated trainers:** The project lead should assign dedicated trainers or personnel to focus solely on training and user support practices. As trainers should have a deep understanding of both SAP and the specific needs of the users, the system integrator partner (Fujitsu) should work in collaboration with internal trainers to provide guidance that is context specific to the case organization.
6. **User-centric language:** Training materials and instructions should apply more user-centric language, avoiding overly technical or complex terminology. In other words, customizing training content to align with the language and terminology used within the organization. Also, refrain from only adopting English words to refer to specific functions or processes and use an equivalent term from the native language. This ensures that, specifically in those organizations where the company language is not English, the content is followed by everyone.
7. **Support networks for system issues:** Act promptly to address any usability issues or inefficiencies in the SAP system reported by user. Involving end users in the troubleshooting process and creating an environment for user communities where they can ask questions and share insights, can positively impact their level of engagement with the system and contribute to a sense of collective purpose.

8. **User engagement strategies:** Closely related to the previous step, the organizational lead should incorporate strategies to improve user engagement. This could include showcasing success stories of employees who have benefitted from SAP training and user proficiency, and highlighting the positive impact of using SAP on individuals work efficiency and the organization's overall success.
9. **Clear role definitions:** Roles and responsibilities for different SAP users should be clearly defined to avoid confusion and ensure accountability, after which these roles should be communicated effectively to all relevant employees. A responsibility assignment chart or matrix (RAM) can be a useful tool to identify and clarify the roles of different users, after which targeted communication becomes more straightforward.
10. **Continuous learning culture:** Moreover, the effectiveness of users' level of engagement with the system is connected to recognizing and encouraging employees who actively engage in improving their SAP skills. This means fostering a culture of continuous learning and self-development and involving the users in all aspects of the project.

Now, it is important to revisit the research questions introduced in the beginning of this study. I was able to demonstrate the connection between organizational learning and successful assimilation of ERP systems in users, as proposed in RQ1 "How does organizational culture influence user assimilation and engagement in ERP Projects?". However, it was also found that there are other reasons to wherein user assimilation of ERP systems can be achieved. Thus, their relation needs further investigation in a variety of contexts and in connection to individual factors affecting learning. Connecting the second research question to my findings happened in two levels. RQ2 attempted to respond to the question "How can organizational learning practices be adapted in order to enhance individual level ERP assimilation?" and multiple suggestions were gathered. First, from observation made in previous literature (Chapter 2.4) I was able to present an overview of organizational learning practices used in ERP trainings with a special focus on supporting individual learning processes. Second, by means of a qualitative analysis method, I managed to gather first hand observations from focus interviews with SAP ERP users of the case organization and was able to gain insights based on empirical data. In

both cases, understanding the profile and learning style of the user was deemed important when designing ERP training. Other suggestions were adopting diverse learning approaches, designing learning plans and framework, enhancing internal communication, investing in dedicated trainers and continuous assessment of training practices.

6. RESEARCH LIMITATIONS AND RECOMMENDATIONS

Overall, conducting the qualitative research was a laborious undertaking as both the topic and object of investigation were complex. While some valuable insights were gathered from the analysis, there were concrete points of limitation. The first constraint was the small number of respondents resulting in insufficient data from which to draw relevant conclusions. Moreover, the initial attempt to include one management level employee to provide their inside perspective about topics related to organizational communication and training practices failed and thus, the questions sent to the respondent were excluded from the definitive version of this paper.

The diversion from the interview questions and the quantity of unrelated material in interview discussion posed the second limitation. Despite that the topic of the interview was specified before the interviews and formulated according to the findings from the literature review, on many occasions respondents answered off-topic and seemed to be determined to criticize the system instead. It is possible that the interview structure was not sufficiently clear, and the open-ended question format resulted in the conversation flowing to broader directions. One way to ensure the relevance of the subject matter is to provide participants with details of the interview process beforehand, including the format, and clearly outline what is expected from the interviewees.

The third impediment is related to the target group of the research as well as unfulfillment of certain respondent criteria. The object of investigation was intended to be end-users of ERP system yet for the most part, the respondents were key or primary users of the system and thus, not enough information was gained about the sentiments of unexperienced users

or employees who had limited previous experience with SAP. Additionally, as mentioned in the Methodology chapter, interviewees were mostly working in the educational sector. The choice for limiting the scope of the respondent's background was based on the case organization's willingness to provide a response to the feedback form provided to the educational sector employees. For future reference, it would be valuable to conduct research with users from different sectors to achieve a more holistic understanding of the effectiveness of training practices.

7. CONCLUSIONS

In response to the evolving business landscape, companies are increasingly adopting Information Systems, particularly Enterprise Resource Planning (ERP) solutions, to streamline various operational tasks. However, many scholars have stressed that an important building block in achieving successful ERP project outcomes requires at its base an organizational culture that promotes learning, innovation and knowledge sharing. Consequently, the aim of this study has been to first, show the relation between organizational culture and learning, and how together they foster assimilation and acceptance of systems such as ERP, and second, what are some specific actions to take or learning methods to apply to optimize individual users' learning.

Previous academic literature shows a correlation between organizational learning practices and ERP assimilation as well as the overall culture. In this thesis I was able to support the first research question (RQ1.) with similar studies conducted about the assimilation and adoption of Information systems, however, the results of the literature review did not offer any novel insights as such. Thus, the first section of the thesis serves as a short historic review of previous academic literature in relation to themes of organizational learning and knowledge management. The second part of the research together with RQ2. contributed to an improved understanding of different individual level learning factors and ERP training practices. First, the literature outlined theories and frameworks applied in ERP training design, together with some useful terminology and concepts. Next, the paper employed qualitative research methods, including semi-structured interviews with employees of the City of Turku, which was chosen as the case

organization. The interviews gathered insights into participants' experiences with SAP training and usage.

The findings reveal several key themes. First, users with previous SAP ERP experience have an advantage in learning the system. Second, training practices aligned with users' learning preferences are crucial for effective training. Participants value both individual and collective learning, and blended learning approaches. Third, I found user engagement and motivation to be influenced by perceived usefulness of the SAP system and its reputation within the organization. Fourth, both project communication and training practices need improvement. Participants highlighted the need for clear and timely communication from top management and more targeted and structured training programs.


Based on the findings, the paper proposed guidelines for enhancing SAP ERP training and learning in the case organization. These guidelines include tailored training programs based on user roles and experience, diverse learning approaches and resources, improved communication plans, systematic feedback processes, dedicated trainers, user-centric language in training materials, support networks for system issues, and fostering a continuous learning culture. All in all, the paper has been able to answer some of my questions at the beginning of the study, yet, there were a number of limitations that should be addressed. For instance, the number of participants was scant and respondent background lacked diversity, which limited the amount of viable data from which to form any robust conclusions. Having a larger and more varied sample population would have been needed to support the results and a comparable study in a different setting. Overall, I hope that this thesis can contribute to the understanding of organizational learning and user assimilation of ERP systems. I believe that the findings underline the importance of considering differences in individual users and learning preferences, as well as effective communication and training practices, in designing ERP training.

8. APPENDICES

1. Interview questions for end-users:

1. Aloituksena, voisitteko kertoa lyhyesti teidän taustastanne? Eli millainen ammattitausta teillä on? Mikä on roolisi/nimikkeesi Turun kaupungilla ja kuinka kauan olet ollut kyseisessä roolissa?
2. Kuinka kauan olet käyttänyt Sappia työssäsi? Milloin olet viimeksi saanut SAP-perehdytystä?
3. Kun sinua on perehdytetty käyttämään Sappia, millaisilla menetelmillä koulutusta on järjestetty? Esimerkit: ns. perinteiset "luokkahuone koulutukset", tai verkkopohjaiset koulutukset kuten, vaikka videotallenteet, oppimisalustat (Enable now)?
4. Millaisena oppijana pidät itseäsi? Opitko esimerkiksi paremmin tekemällä itsenäisesti (learning-by-doing) vai suositko ohjattua opetusta?
5. Entä mitkä koet olevan vahvuutesi oppiessa uusien järjestelmien käyttöä? Entä heikkoudet?
6. Mitkä tekijät vaikuttavat eniten haluusi oppia SAP-järjestelmistä? (Esim. helppokäyttöisyys, hyödyllisyys, ajansäästö, omakohtainen motivaatio oppia ja kehittyä)
7. Kuinka hyvin pystyt soveltamaan oppimaasi käytännön työtehtävissä? Onko siitä ollut apua työtehtäviesi suorittamisessa?
8. Millaisia haasteita olet kohdannut oppiessasi SAPin käyttöä?
9. Koetko, että sinulle on muodostunut selkeä kuva SAPin/ versiopäivityksen käyttötarkoituksesta? (Oletko kohdannut puutteita Sappiin liittyvässä viestinnässä?)
10. Millaisia tukitoimia tai resursseja olisit toivonut lisää SAP-koulutukselta?
11. Onko käyttöönottovaiheen jälkeen tarjottu loppukäyttäjälle jatkuvaa järjestelmätukea? Esim. pääkäyttäjien tuki, prosessikuvaukset, manuaalit

2. Presentation slides for research pitch meeting


 Abo Akademi

20.3.2023

ESITTÄJÄ
 Amaia Martin-Granizo

Tutkimussuunnitelma

"Oppiva organisaatio ja sen vaikutukset käyttäjien tiedon omaksumiseen toiminnanohjausjärjestelmissä: suosituksia parempaan koulutusmuotoiluun"





Suunnitelma

1	Taustatietoa tutkimuksesta
2	Viitekehys
3	Tutkimuskysymysten esittely
4	Haastattelut ja aikataulu
5	Kysymyksiä

Tutkimuksen tausta

- Harjoittelun aikana lisääntynyt käsitys tietojärjestelmien saavutettavuudesta sekä yksilöiden asenteista sen toimivuudesta/tarkoituksesta
- Omana kiinnostuksen kohteena kouluttamisen vaikutus loppukäyttäjien tiedon omaksumiseen ja sen soveltaminen organisaation tavoitteisiin
- Sisäisen kohderyhmän hyödyntäminen mahdollisten parannusehdotuksien selvittämiseksi
- Kontekstina Aura-hanke sekä SAP S4 HANA Versiopäivitys



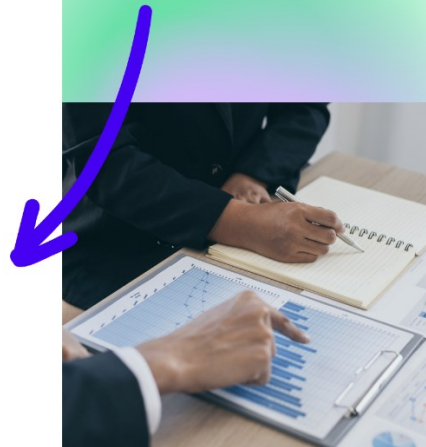
Viitekehys (teoreettinen)

Yleiskatsaus	Uusi tutkimusikkuna
<ul style="list-style-type: none"> Organisaation koulutuskäytännöillä on yhteys onnistuneeseen toiminnanohjausjärjestelmän käyttöönottoon. Vahvan yhteys käyttäytyvyyden, osallistumisen ja toiminnanohjausjärjestelmän kannattavuuden välillä. Oppimista kannustavilla käytännöillä ja toiminnanohjaus- koulutuksella on huomattava vaikutus tiedon omaksumiseen sekä järjestelmän laajempaan käyttöönottoon. 	<ul style="list-style-type: none"> Ymmärrys käyttäjäryhmien ja yksilöiden oppimismielityksistä on ollut puutteellista ja niiden kartoitus on ollut vähäistä. Suomessa kyseisen tutkimusalueen tarkastelu kirjallisuudessa ollut vähäistä.

Tutkimuskysymykset

- Millainen rooli oppimisella organisaatiossa on käyttäjien motivaatioon osallistua tietotekniikkakeskeisissä projekteissa, kuten toiminnanohjaus järjestelmän käyttöönotossa?
- Miten kohdeorganisaation oppimisen käytäntöjä voidaan mukauttaa käyttäjien mieltymyksiin, jotta tyytyväisyys toiminnanohjaus järjestelmään sekä käyttövalmius lisääntyisivät?

Yhteistyön tavoitteena perehtyä 2. tutkimuskysymykseen



Haastattelut

Kohderyhmän valinta	Aikataulu
<ul style="list-style-type: none"> • Opetuksen palvelukokonaisuus • 6-8 haastateltavaa <ul style="list-style-type: none"> ◦ 2 hlö johtoportasta, 4-6 loppukäyttäjää • Mahd. jako kohderyhmiin • Uudet käyttäjät SAP S/4 Hana versiopäivityksen jälkeen • Ikä, koulutustausta, aiempi kokemus tietojärjestelmien käytöstä • Oppimisprofiili - millainen käyttäjä on oppijana 	<ul style="list-style-type: none"> • Yhteydenotto haastateltaviin maaliskuun vaihteessa • Haastattelut alustavasti sovittu alkavaksi pääsiäislomien jälkeen

Kysymyksiä?

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PUHELIN

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