



**Linnæus University**

Sweden

Master's Thesis

# Upskilling of Digital Skills During Digital Transformation

*A Qualitative Study about Mindset & Challenges of  
Middle-aged group Employees in Supply and  
Finance Units.*



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*Date:* 2022-09-02  
*Course Code:* 4IK50E, 15 credits  
*Subject:* Information Systems  
*Level:* Graduate  
Department of Informatics

## **Acknowledgment**

We would like to thank our supervisor Jan Aidemark for his patience, continuous guidance, and feedback we received during our master thesis. In addition, we thank our teacher Niki Chatzipanagiotou for her support during the master's program.

We would like to thank our examiners Anita Mirijamdotter & Päivi Jokela for their support and guidance during the seminars. Also, we thank Soumitra Chowdhury, for his support during the course and different preparation seminars.

Thanks to Linnaeus University's academic staff for all the efforts during this program.

Many thanks to the participants of this study and their great assistance during work. Thank you for your valuable input!

lastly, we want to thank our families for their constant motivation and support throughout this journey.

Sincerely  
Dima Haj Osman & Yogesh Singh

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## Abstract

Industrial Revolution 4.0 and Finance Technology are influencing firms to adopt the Digital Transformation strategy to achieve their long terms goals and remain competitive. This transformation is driving an evolution in the way of working in Supply and Finance units and creating an emerging demand to implicate digital skills and consider them as core competencies needed for the workforces in those units. Management takes a vital role in supporting the employees to upgrade their digital skills and providing them with a culture that facilitates their efforts throughout this shifting journey. Middle-aged groups of the workforce make a major contribution to the labour market, and they are likely to have a higher digital skills gap than younger groups. This requires firms to put more focus on upskilling and enhancing the digital skills of this group to enable successful adoption of the increased interaction with technology. During the upskilling of digital skills processes, the experience of the workforce may include challenges. It is important for the leaders and human resources to understand the mindsets of those employees and their challenges to consider when revising the digital skills learning initiatives.

Thus, this master thesis examines the mindset and challenges of supply and finance employees from the middle-age group of the workforce during digital skills upskilling programs driven by DT. Additionally, based on the finding to develop a framework that can help firms when initiating digital skills upskilling programs. For this, an interpretive qualitative study was conducted. The data was collected through semi-structured interviews and Lichtman 3 Cs thematic analysis was used and generated five concepts. Those concepts represent the findings of the master's thesis research and are interpreted and discussed with the help of the theoretical framework of the double-loop learning method of Organizational learning Theory for Argyris and Schön (1997).

The research findings show the scoped group embraces digital transformation and has an open mindset to change and the ability to contribute, but they also face challenges that are: Incentive and Recognition, Organizational Communication, Working and Learning in parallel, Customized learning programs. Based on the identified challenges, a framework was developed to support human resources and supply and finance leaders to consider during upskilling of digital skills programs, to provide a better experience for the digital onboarding of the workforces during DT. This study contributes to the existing knowledge of the informatics research field. The practical contribution is to help organizations, and human resources, in improving the digital skills upskilling programs and frameworks, additionally to organizational learning.

**Keywords:** Supply, Finance, Digital skills, Upskilling, Digital transformation, Middle-age, workforce, Challenges, Mindset, Qualitative research.

# Introduction

Chapter 1 introduces the background and the problem of the chosen research topic. The research purpose and the research questions. Previous related research is presented, and the chapter concludes with the limitation of the research topic.

## 1.1 Background

Digital transformation DT is the incorporation of digital technology into all areas of business leading to fundamental changes in how companies operate and how they provide services. It is a cultural change that requires institutions to constantly challenge the status quo (Deiser, 2018). The complexity of the world is increasing, and the technology change is forcing organizations to digitalize quickly, and to agile vastly, it is a matter of existence for today and reserving a position in the future. Further, the pandemic of COVID-19 has obliged several organizations to face significant transformations and reframe the business processes and technology utilization to keep the resilience in operations while taking on to changing (Holtel, Kowalczyk and Paegle, 2020). Information Technology IT has become the primary driver of business innovation. Taking on this transformation requires everyone in the company to rethink the role and impact of IT in their everyday experience which is an important component of DT. Often it is about abandoning old processes and old tools by relying on new technology, but DT expands to a wider concept of enabling innovation and creating a new culture, It covers the aspects of providing a seamless user experience, and agility in running the operations digitally without compromising the privacy and security of this data (Brunetti et al., 2020) (Holtel, Kowalczyk and Paegle, 2020) (Warner and Wäger, 2019).

Information and communications technology ICT companies are in a race to invent modern technologies, which have no limits but imagination. This is to generate greater advantages for the economies of markets and firms. leveraging developed technology in businesses would introduce the organizations at a higher speed to larger geographic groups through social media, and websites. Companies would be better able to reach customers that go beyond the categories defined in the traditional business plan. It also makes production easier, and more economical (Yeow, Soh and Hansen, 2018) (Li, 2020).

As consequence, DT is creating an evolution in the ways of working for supply and finance functions. Internet of things IoT, artificial intelligence AI, autonomous robotics, enterprise wearables, and additive manufacturing are among the major innovations that are expected to have a significant impact on logistics and supply chains and are currently in various stages of development and implementation across business sectors. Manufacturing processes are being influenced by a wide range of these advancements. Consumer products expectations, factory operations and footprints, and industrial supply chain management are all being altered to unprecedented degrees and at unprecedented speeds. As a result, industry analysts and leaders predicted that Industrial Revolution IR 4.0 technologies would change traditional methods of value creation (Deepu and Ravi, 2021). In addition to Supply, Finance organization plays a very dominant role in keeping companies running to achieve business goals and values. Industry experts and analysts believe that the DT journey is the future of the finance function that may consider a fundamental and urgent shift to meet the requirement of the fast-changing and digital world. Financial Technology FinTech is providing a great advantage to financial services and reporting to become more digital and agile, it is enabling growth in business opportunities and enhancing creativity in finding new ways of working towards more efficiency at lower costs (Gullers and Gref, 2021).IR 4.0 and FinTech have necessitated the

development of more new talents to align the requirement of a more demanding job scope in those functions. Many old operating methods have been gradually displaced by automation-based operations. Therefore, a rescue operation need for upskilling and reskilling grew (Deepu and Ravi, 2021).

The human workforce is a backbone part of DT. Therefore, a successful DT requires a matured culture among employees. This is by increasing the awareness campaigns for digital skills, digital education, and producing educational content that includes both employees and customers. Also, empowering the capabilities of employees to keep pace with change in the work environment and to be relevant about using the new technological methods. Talents are important business heads as the monetary capital. The transition to DT requires a level of attention to the training needs of employees, also empowering them with the necessary tools that move them to the future of business, make routine tasks easier and more accessible, and open up broad prospects for unlimited development in the areas of specialization that leads to innovation and creativity (Warner and Wäger, 2019) (Brunetti et al., 2020).

Increased uptake of advanced technology is accompanied by growing digital skills shortages within people, where reskilling and upskilling employees is one of the most critical challenges that organizations face (Yeow, Soh and Hansen, 2018) (Warner and Wäger, 2019). Going through DT means a major shift in the structure of the work, as current jobs become obsolete with automation, and new capabilities are required. The Labour laws bound a company's flexibility to quickly shift the arrangement of its workforce through hiring and firing. They are obligated to find strategies to quickly reconfigure the skill sets of tens of thousands of employees. Furthermore, increasing life expectancy, other demographic changes, and the volatile economy affect labour market. Large companies have a workforce with diverse years of experience, and skills, this requires setting the right digital upskilling strategies to suit the different workforce (Deiser, 2018).

In the digital age, employment terms are also changing based on these novel competencies; therefore, companies are relooking into their strategies to renew their capabilities to fit into the transformed job. A suitable solution would be to advocate digital learning because it embeds the digital content and may be delivered in social elements in the view of the design and processes through offering the opportunity to informal business problem-solving, sharing knowledge, and practices between communities in a general platform. The main advantage of promoting it is that employees can take mandatory courses related to their work activities, and also, the plenty of choices to acquire knowledge in other domains spontaneously and continuously (Sousa and Rocha, 2019).

Organizations have young and middle-aged employees working parallel to achieve organization goals however, it is often assumed that workers' knowledge and skills decline with age. Beck (2008), highlights that "older workers' productivity is not reduced by their age but by skill obsolescence". Therefore, understanding the digital skills gap for middle-aged workers needs to be in focus (Martin, 2018). Research has been done around tackling hurdles to DT and the role of competencies reveals that staff under 36 years display clearly stronger cognitive competencies in comparison to the group "36 years and above", which exhibited stronger processual competencies.

The middle-aged group of workers (48-63) years old (Lin et al., 2020), requires greater attention from organizations for upgrading their digital skills according to OECD Organization for Economic Co-operation and Development (Martin, 2018). Particularly in the 4th IR age, given that the younger workers outscore higher in this area. This is an essential factor for firms to understand their digital learning needs to manage setting it in the most useful ways (Deiser, 2018) (Warner and Wäger, 2019). Furthermore, The Organization for Economic Cooperation and Development recommends policies for employers to provide a great level of options and opportunities regarding working environments for the labor aged (55–64). Also, the EU gives special attention to developing strategies for this group because their productivity may impact the economic income of their countries which form a 60.48% employment rate for 2020 (OECD, 2022). Highlighting that, the middle-aged group of workers are healthier and better educated than previously. They are more active and aim to stay at work much longer according to statistics (Bal et al., 2011).

To encourage innovation in a digitalized firm, a varied distribution of human capital would be helpful, it will enable the deciders to adapt the human capital towards a better distribution of the innovative potential of a firm that passes through the DT. This requires plans to develop mindsets and lift the existing skill sets to meet the evolving demands in the digital age, to achieve fair integration for all workforces, thereby, surviving in the competitive working environment. Understanding the employees' mindsets, and challenges, are essential components for setting efficient upskilling strategies during DT (BUTSCHAN et al., 2019).

## **1.2 Purpose Statement and Research Questions**

The purpose of this master's thesis research is to understand the mindset, that employees from the middle-aged groups working in the supply and finance units experience during DT. In addition, this master's thesis explores the challenges this group face during the digital skills upskilling programs, as a consequence of DT where new demands and changes emerge, given the increasing involvement of advanced technology in the jobs of those specified functions. Based on the findings, a framework will be proposed that may help the firms in improving their organizations' digital upskilling learning process.

This purpose gives rise two research question:

- **RQ1:** What is the employee mindset during the digital transformation journey within the organization?
- **RQ2:** What are the challenges that employees from the middle-aged groups experience during the digital skills upskilling programs?



### 1.3 Topic Justification

The research topic is relevant to the informatics field of research. DT is becoming a universal challenge within organizations, and they require a multilayered set of strategic actions to address it, described as three main pillars in this. The first pillar, named “culture and skills”, includes three strategic fields of action as follows: digital education, talents, and digital culture. The second pillar, named “infrastructures and technologies”, points out the need for information, interaction, and artificial intelligence as key strategic fields of action. The third pillar, named “ecosystems”, highlights the importance of investing in medium- to long-term visions, partnerships, and life quality (Brunetti et al., 2020).

Studies refer that IR4 creates the need for DT in supply and finance units, leading to a shift in the ways of working and roles performed in those functions, and this will continue to evolve in parallel with technological development (Deloitte, 2022). The spread of digital representation of businesses, the increasing demand for digital services, and the centralization of goods, products, and services around the customer, instead of focusing the production process on products as in the past, requires organizations to set new strategies and establish new business models to manage this transformation (Yeow, Soh and Hansen, 2018) (Li, 2020). Advanced technology continues to enable the logistics and supply chain industries to cut costs, eliminate carrying inventory, and improve asset usage efficiency (Deepu and Ravi, 2021). For successful DT in Supply Industry and finance functions, to scale the benefits with these available technologies, The digital upskilling of the workforce is a major need to adapt with the heavy involvement of new technology.

Andriole (2018) says, Business modeling, robotics, real-time analytical & simulation, location-based technologies, augmented reality, cloud computing, agile program management, DevOps, IOT, 5G, digital security, blockchain, AIML, Low-code etc. are some of the major skills and competencies needed for supply and finance units in DT journey within ICT companies.

The ability to adapt to digital future within organization, depends on developing the next generation of skills, closing the gap between talent supply and demand says Frankiewicz (Frankiewicz and Chamorro-Premuzic, 2020).

DT for functions requires the development of digital learning programs which allow people to benefit from this initiative during their working and non-working lives. In this sense, the workplace can be used as a learning place to offer permanent training to workers on digital issues and training initiatives can involve the best possible collaborators in reskilling and upskilling activities for successful DT (Brunetti et al., 2020).

CEOs, CFOs, and CTO have a mission to identify and enhance the digital skills of employees working in these units because technology is being highly integrated into the way business is conducted. Augmented analysis, cloud computing, and security compliance are new domains presenting themselves to supply and finance, therefore talent gaps need to be filled in the right way to survive (Andriole, 2018) (Deiser, 2018).

Workforces are diverse in age, middle-aged groups of employees are often seen as having superior job skills, they are the Subject Matter Experts SME of the job. They are mature professionals who offer a variety of knowledge, skills, experience, and positive attitudes to the workplace, which complement those of less experienced workers. According to Tikkanen et al. (2002) study, employees believed that as they grew older, their social skills, professional

competence, and job morale improved. Also, internally in SMEs, the job skill of experienced workers is recognized and utilized, however, some of the competencies and abilities get outdated. Connecting this with the vast changing technology and the demand of the digital era and DT in several functions, managing the digital shortage efforts is seen greater towards the middle-aged group of workers. This is for the survival of the organization as this group continues to be important from a contribution perspective, also as they form a major part of the demographic representation of the workforce (Martin, 2018) (Arbogast, Cummins and McGrew, 2018).

Employees are also facing challenges that require having a growth mindset and increasing their adaptivity, organizations efforts do not get achieved without a response from workers to change (Deiser, 2018). Nowadays, the number of middle-aged workers attending academic institutes is increasing, this is to enhance their digital capabilities and improve their employability (Arbogast, Cummins and McGrew, 2018). By age, the ability to acquire new skills get harder, but middle-aged worker takes compensatory action to solve. Schinner et al. (2017), suggest a competence development model ensures employability for the aging workforce.

The aforementioned studies focused on how DT is changing the roles in supply and finance units, the need for digital upskilling with the shift in the tasks to involve core IT skills, and the role of management to set strategies and taking actions to manage the ICT skills competence gaps of human capabilities. But none of them focused on understanding the challenges middle-aged employees face when they are requested for upgrading their digital skills, as an emerging demand of DT, focusing on the supply and finance units.

Concluding, the aforementioned studies reflect that successful digital upskilling of resources plays a pivotal role in achieving a successful DT, and there are a lot of opportunities in the Supply and Finance sectors. However, we find a gap in knowledge about the employee experience during that, particularly who belong to the middle-aged group of workforces. Thereby, this has motivated us to explore in this research, to further understand their mindset toward DT and what type of challenges the face when they are requested to upskill their digital skills. The finding of this study would help firms in improving the employees experience during this journey and help them better in enhancing their digital capabilities throughout effective upskilling programs.

#### **1.4 Scope and Limitation**

This master's thesis focuses on employees in the supply and finance units that are going through the DT journey where digital upskilling became emerging demand, given that IT is becoming a core skill needed for those functions. Also, it focuses on ICT companies as they are prime in adopting this transformation considering the nature of business. In addition, the study is limited to participants from the middle-aged group of workers, given the importance of their job contribution, also as they form a major part of the demographic representation of the workforce according to (OECD, 2022), which achieved an increasing trend over previous years and seen to have a higher lack of digital skills versus younger groups (Martin, 2018). Sweden is selected as the location for the study because it records as a country with the highest scores in terms of employment rate for of middle -aged group employment, motivation of participation in learning, and digital technology adaptation (Cristea et al., 2022). Also, the current generation trend to retire at a late age (Walwei and Deller, 2021). Besides, the availability of several ICT companies.

## 1.5 Thesis Structure

The master's thesis consists of six chapters as shown in figure 1:

- The first chapter presented the background and the problem of the chosen topic. The research purpose and the research questions were stated. Previous research was presented. The chapter concluded with the limitations of the research topic.
- The second chapter presents the literature review, which is the basis for this master's thesis followed by the theoretical framework.
- The third chapter presents the adopted research paradigm, the research approach, and the methods for data collection and analysis.
- The fourth chapter will include the empirical findings of the study and will present the thematic analysis of the interviews conducted.
- The fifth chapter is comprised by a discussion of the findings that will try to answer research questions that have been posed.
- The sixth chapter will discuss the research contributions and the suggestions for future research.

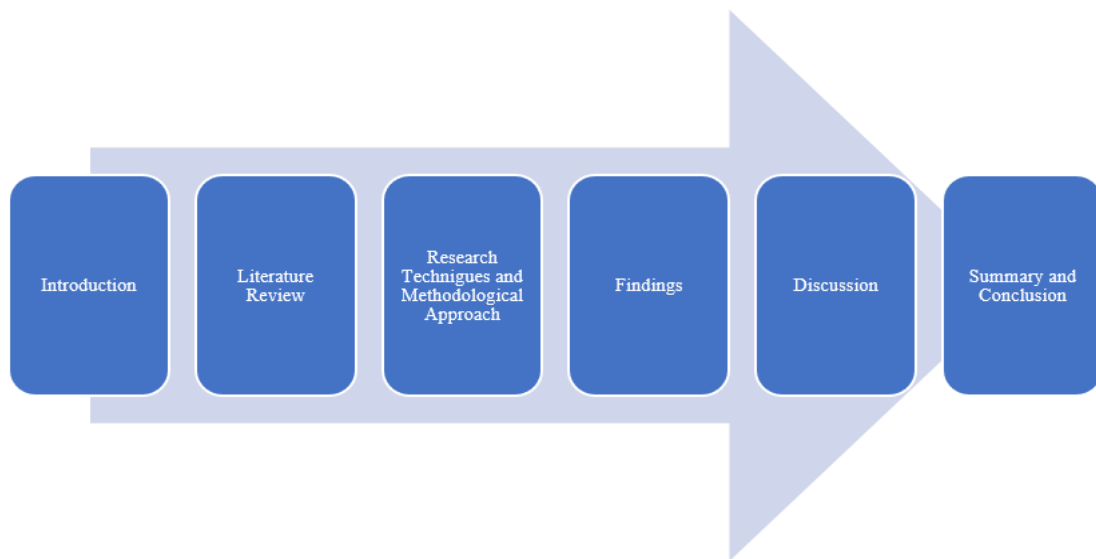


Figure 1: Thesis structure, adopted from (Benson and Filippaios, 2016)

## 2. Literature Review

Chapter 2 presents the literature review of the main areas related to the master's thesis topic. That are, Demand for core digital skills in Supply and Finance roles, Importance of Upskilling for Organizational Growth, The role of Management during DT, Digital Skills and Challenges of Middle-aged workforce, Organizational Learning and Knowledge process. The chapter finishes with the proposed theoretical framework of the master's thesis, which is used to interpret and discuss the research findings.

### 2.1 Search Strategy

According to Creswell and J David Creswell (2018), literature review helps in summarizing thoughts about the topic using prior studies to form an understanding about the topic. The search strategy was conducted based on key ideas within the scope of the research. The search process is a manual search done by using the following databases: Scopus, ScienceDirect, JSTOR, ACM, IEEE Xplore, Academia, Springer, and Google Scholar, focusing on research papers from the basket of eight which are the top ranked journals within the field of informatic. Various keywords and combinations were identified and used in search process: “challenges in upskilling” ,” digital transformation and employees mindset” , “ digital skills” ,“digital Transformation challenges”, “digital transformation and supply”, “Upskilling in digital transformation”, “Impact of age group on learning ”,“learning behaviour with age group”, “age difference in skill acquisition”, “middle age workforce and digital skills”, “Resource management in Digital transformation” , “Knowledge management framework in Transformation” , “Competence Development at work”, “Competence development process”, “digital Transformation challenges in Supply”, “Digital Transformation challenges in finance”, “organization learning”, “Teaching elderly people”.

A set of inclusion and exclusion criteria were set. We have selected papers only if they were available as full text and written in English. Also, we focused on selecting recent papers which are published within the last decade, 2012-2022. However, five papers of earlier dates were added due to their importance.

The search was carefully refined. After skimming and reading the abstract and conclusion of several papers, 28 papers were chosen as they are the most relevant to our topic. The validity and quality of included studies were assessed (Creswell and J David Creswell, 2018). Selected papers are presented in appendix 1. The literature also included two articles from official websites to support the research from professional association perspective.

### 2.2 Demand for Core Digital Skills in Supply and Finance Roles

Digital skills can be defined as operational skills, formal skills, information skills, and strategic skills. The operational skills meaning the ability to use the technology, formal skills are the ability to pass through digital media, information skills are the ability to search online, strategic skills ability of translating the digital information to a development that can be personal or professional (Gates and Wilson-Menzfeld, 2022).

Given that the skills models are rapidly shifting, new roles in the finance domain would rise such as business analysts, data scientists, and storytellers. This is a sea change for many finance groups. To prepare for this, finance leaders need to ensure that hired employees reflect the wanted competencies for the future desired. besides that, important characteristics are needed

to display a great commitment to customer service, adaptability, and effective collaboration - in addition to the technical competence required. The vision is that all finance employees should be able to contribute to the enhancement of business value through effective communication, and influence (Gullers and Gref, 2021) (Deloitte, 2022).

According to McKinsey, the key demanded skills in future would be the agility, flexibility, and technical. Those skills are to adapt with the identified six competencies stated by management accounting competency framework IMA, and they are: 1) High level of digital and acumen of reporting and control, 2) Data and science analysis using programming software's, 3) Leadership ability to handle massive tasks and data remotely, 4) Strategic planning and performance management using effective automation projects. 5) Business acumen and understanding of customer value to enhance and direct focus of what AI and ML are performing, 6) Compliance and Ethics, especially that digital data age is creating more challenges in this area (Koch, 2021).

Furthermore, table 1 below (Deloitte, 2022) summarizes an overview of the main changes expected under DT to the finance function related to the workforce and working environment:

Finance Workforce	Work Environment
Less human interference, with the advanced technology emerging into ERP platforms. Financial services will be delivered through smart applications towards stakeholders to enable quicker decisions.	Customized applications and complex applications.
Traditional skills will be replaced by automation and sold as self-services. Valuable talents that have the best customer understanding and deal with advanced technology.	Secured Chatbots.
A collaborative team consists of robotics, humans, blockchain, artificial intelligence.	Innovation centre, cross-functional teams, agile leadership.
Need for data analysts, and scientist.	Data focus will be part of the finance scope.

Table 1: Main changes during DT journey , adopted from (Deloitte, 2022).

The future of finance is being outlined, the financial mundane transactions will be automated; therefore, companies need a resilient workforce to overcome the predicted changes. In modern countries, companies are taking an advantage of forming a diverse team factoring workforce age group. This is not only for older workers to transfer their knowledge but also for them to open a channel for obtaining new and technological skills. Also, it is beneficial for the organization to factor the several aging groups when setting policies which would lead to more wisdom in taking decisions (Lim et al., 2020).

According to Deloitte (2022), and based on the current advanced technologies there are eight predictions for what would change in the finance organization that chief financial officers need to prepare for, furthermore, they are the key indicators lighting the need of transforming digitally in the finance functions:

1. The factory of finance: as automation and blockchain technology penetrate more into finance operations, transactions will become frictionless. Cloud-based ERP, automation, and cognitive innovation will continue to advance at a rapid rate in the coming years, offering the potential to dramatically simplify procedures and free up employees. By including blockchain into the mix, this movement will be accelerated. As this transformation accelerates, humans' ability to contribute value will be released.

2. Finance functions' role: it will focus on company insights and service, with processes substantially automated. Finance's capacity to provide value will determine whether it continues to direct the resources it now controls. This will necessitate superior understanding and client service. Certain financial firms will eventually transform into full-fledged business service centres.
3. Reporting cycles: financial transactions are conducted in real-time and periodic reporting will cease to be the driving force behind operations and decision-making. Because both actuals and projections can be generated quickly on demand, conventional reporting periods may not be needed. The traditional division between transactional and analytical data is collapsing. Finance firms will continue to be required to fulfil external requests for cyclical data for shareholders who may desire more regular performance. The finance unit may adopt a new rule of not providing historical data or not projecting on a month-to-month or quarterly basis because all is taking place in real-time. Conventional cycles become obsolete. This frees up individuals to concentrate on generating new ideas and taking action.
4. Self-services will become standard: there are several business owners who do not require assistance with basic financial information. They would accept having their inquiries addressed by a robotic voice on their laptops or mobile phones. Automated activities will include expenditure calculations, management reporting, and so more. Over time, the finance person will understand what kind of financial data that stakeholder requires and will proactively give that advice or figures. As that reality develops, excel data will be replaced with visually rich, intuitively accessible, and simple content.
5. Change in operating models: there will be a diverse workforce as robotics and algorithms integrate with the human workforce.
6. New Enterprise resources system: finance programs and apps represent a threat to current enterprise resource planning systems. Large suppliers will be present with a cloud-based ERP system ensuring that companies are always up to speed with the current version.
7. Data: although the spread of Web services will contribute to data formalization, it will not be sufficient. Businesses will continue to face challenges to wipe up the data problem.
8. Personnel and work environment: employees will do creative tasks in clever ways.

Finance human capabilities play a key role in this transition because it has a direct impact on their way of working, and the type of work. Further, advanced tools, systems, and the involvement of machine learning and artificial intelligence are competing in providing financial services at a lower lead time and higher accuracy. There are many concerns in some areas such as compliance, data privacy, and regulations that would be solved by time, but for many other areas technology is being presented as a solution (Gullers and Gref, 2021) (Deloitte, 2022).

Similarly, Supply chains are getting more competitive, complex, expensive, hazardous, and unpredictable in today's world. Traditional supply chains become smarter as a result of the use of information and communication technology (ICT), digital technology, and big data analysis. This enables better management of future difficulties in the digital era. These digital era technologies have been discovered to meet the essential supply chain objectives of faster, cheaper, and better product availability and consumer reach. The Internet of Things (IoT), Big

Data and Analytics, and the interconnectivity of digital devices are all part of the digital era, which necessitates modern technology to capture, gather, store, analyze, and interpret massive amounts of data. The data-driven revolution will change the way business is done in the future, as well as the way supply chains are managed. Analysis of large amounts of data will be core in the digitization journey of supply chain (Lu, 2021).

Globalization over the years has radically altered the manufacturing world over the last two decades. Because they were no longer bound by geography, many companies moved their production to lower-cost locations solely to save money on labour. As a result, more developed countries lost their manufacturing industries, as well as a significant portion of their workforce. This trend is now slowly reversing, owing in part to rising labour costs in many emerging economies, as well as a reconsideration of the factors that initially prompted relocation. Big data is affecting our lifestyle and industrial operations as a result of the Internet's innovation and promotion, as well as cloud computing and other technologies. For the first time, the 19th CPC Central Committee's Fourth Plenary Session defined big data as a factor of production in the central document. Big data has become a boost for the transformation and upgrading of conventional sectors, as well as an innovation engine for the rapid development of emergent industries with features of non-scarcity, non-exclusivity, and heterogeneity, thanks to state regulations (Lu, 2021) (Yanamandra, 2019).

The data-driven revolution will change the way business is done in the future, as well as the way supply chains are managed. In supply chain management, big data analytics, often known as "supply chain analytics," can assist companies obtain a competitive advantage and reach the status of "Smart Supply Chain." The examination of a wide range of data available in the supply chain from many sources in digital era is critical such as: 1) Product Design, 2) Supply Chain Design, 3) Sourcing, 4) Production, 5) Warehousing, 6) Transportation, 7) Point-of-Sale 8) Consumer influences supply chain management.

Supply chain analytics is the application of quantitative methods (such as statistical and machine-learning techniques), historical and current data, and predictive modelling to identify useful information and improve operational performance in supply chain ecosystems (Yanamandra, 2019).

The supply chain and manufacturing sectors work in a fiercely competitive environment, and organizations are restructuring and re-engineering themselves in response to important needs and problems in the twenty-first century. An aging workforce is one such change that will have a direct influence on many countries' manufacturing functions during the next 50 years. As a result, especially in the wake of the recent global crisis, businesses must be both competitive and embrace increasingly robust manufacturing practices to survive with turbulent markets (Thun, Größler and Miczka, 2007).

Many supply chain managers are unsure what big data is or how it may help them achieve greater performance and positive outcomes in their organizations. They see it as a problem, and they're unsure how to put big data ideas into action, as well as how to establish integrated supply chain operations and information technology infrastructure says (Yanamandra, 2019).

Individuals in the traditional supply chain network lack communication and coordination skills, and thus are unable to respond to market developments promptly. At the same time, asymmetry in information can lead to resource waste, such as the bullwhip effect says (Lu, 2021). This means that leaders are to set the needed strategies to involve putting the proper people and technology in place now to capitalize on the unavoidable uncertain future. Given the fact of the

volatile economy that impacts methods and tools used for conducting business, and the vast growing technology and data (Deloitte, 2022).

### **2.3 Importance of Upskilling for Organizational Growth**

To boost firm efficiency, reskilling and upskilling are critical. According to research done (Mgiba, 2019) updating an existing skill or learning a new talent and expanding one's knowledge will help an individual succeed in their current job or transition to a new position. Furthermore, the author noted that reskilling and upskilling can assist employees in focusing more on the client and market, becoming more agile, and being more flexible in the face of change. Indeed, reskilling and upskilling will help to ensure the company's long-term viability while also lowering employment costs. Employees who have undergone reskilling and upskilling training are able to match the current business needs, ensuring the company's long-term viability. The literature explains the need for upskilling and why it is important to stay relevant to ensure people have a long professional career and jobs.

Growth mindsets, innovation, autonomy, and openness are required from employees under the umbrella of DT. Not all personnel are willing at the same speed to adjust, which may attribute to a lack of skills or knowledge. Therefore, culture is important, people need to be supported with a new set of values to enable self-reflection and contribution to enhance their competencies (Burchardt and Maisch, 2019) (Mergel, Edelman and Haug, 2019).

Conducting upskilling and reskilling training also allows the organization to demonstrate their concern for the employees' careers and futures, as well as ensuring that their skills do not become obsolete. Reskilling and upskilling in the workplace will boost employee enthusiasm, improve the employee experience, and encourage more loyalty. The company's ability to perform technical and soft skill training in order to improve their ability to operate under pressure and build great relationships with colleagues or clients. Furthermore, gaining new skills allows firms and people to improve their performance and stay on the job for longer periods of time. (Wahab, Rajendran and Yeap, 2021) this literature helps us to understand why it's important for organization to conduct upskilling and reskilling programs and how it also shows empathy towards its employees.

Most businesses are seeking to digitally alter their workplaces in response to the deployment of Industrial Revolution 4.0. Artificial intelligence, nanotechnology, quantum computing, synthetic biology, and robots are examples of advanced technology that are being applied in the market and are expected to gradually supersede industrial technologies created during the last sixty years (Ghobakhloo, 2018). According to the World Economic Forum's report, most companies' re-skilling and upskilling efforts are still focused on a limited number of existing high-skilled and high-value personnel. However, in order to properly tackle the challenge of developing a successful personnel strategy for IR 4.0, business executives must consider human capital as an asset rather than a liability (World Economic Forum, 2018).

To be competitive in this business, the company should offer reskilling and upskilling opportunities to its employees. Affording this in the workplace may raise employee morale, improve the employee experience, and encourage more loyalty. Furthermore, gaining new abilities helps a company's management and staff to increase their work productivity and stay on the job for longer periods of time says (Wahab, Rajendran and Yeap, 2021).



## 2.4 The Role of Management During DT

The process of implementing and adapting to the massive changes accompanying DT rests with everyone which may create challenges for the human workforce who are key in adopting and adapting it. Therefore, at this stage leaders play a vital role to ensure that the human capabilities of workers are enriched with effective experience and skill in spreading the culture of DT while preserving the company's identity, brand, and information privacy. Transformation leaders should embrace digital competence, brilliance in communication, and the ability to positively influence all parties involved in the process. They need to revamp and develop methods to improve overall organizational efficiency and effectiveness such as data and document management, information dissemination, etc. Also, keeping the responsibility to support work at all levels considering the flexibility of the decision-making process. Organizations may prepare existing leaders to take on the task of changing the ways of thinking of workers and to ensure that they master the new work tools. At this point, it is possible that organizational changes occur and building new teams to align with transformation (Vial, 2019) (Schwarz Müller et al., 2018).

From the workforce perspective, the recent hire employees within an organization are recruited based on key critical skills meeting the technological demands for the future, however, the employees who have spent several years working in the Supply and Finance functions of the company need to go through change management and upskilling process to adopt the new digital skills to stay relevant and productive for the organization (Vial, 2019). HR executives also take a role in building a successful talent planning to meet the demands of the market in DT era. Establishing frameworks that analyze the ambidexterity of the workforce would help a lot the overall ambidexterity of the organization during this transformation (Jackson and Dunn-Jensen, 2021) (Fenech, Baguant and Ivanov, 2019).

The change in the working environment under DT is inevitable, leaders need to show empathy and take care of the well-being of the workforce when handling the concerns about the future of roles. Management and HR leaders need to unite their efforts with human capabilities to succeed in surviving and keep the resilience in operations competitively in the vastly technological changing era (Trenerry et al., 2021).

In DT, people are considered a challenge due to the gap between available digital competencies versus the demands. Firms try to overcome this by initiating training programs, but the main challenge relies on the need for employees to shift their mindset to harmonize with the transformation (Fenech, Baguant and Ivanov, 2019). Ambidexterity level in managing the work and learn needs to be measured when the performance assessment is done, however, the challenge that organizations face is the lack of clear framework and processes. Therefore, if it gets well designed it would be beneficial for the employees' development and monitoring path disregarding the factor that engagement in stretched work assignments may be optional (Jackson and Dunn-Jensen, 2021).

Guido and Tamilla, (2022), have proposed a typology model of digital skills initiatives. This typology consists of four categories that need to be factored in when setting the digital skills programs: "Target group, Digital skills, Learning format, and Sponsors". Using this model would help the policy makers to evaluate the digital skills level given the high rise of technology especially after Covid-19 pandemic.

During a DT journey it is evident that without transforming end-to-end Supply and Finance functions, it will not be possible for the company to apply the best IT and business practices for a smooth-running operation in response to the digital world, managements play a pivot role in this (Deloitte, 2022).

## **2.5 Digital Skills and Challenges of Middle-aged Workforce**

The interdependencies in two workplace trends that are growing across the world: the “graying” of the workforce and the tenacious evolution of ICTs in organizations. according to OECD, all its current thirty-four member countries are experiencing rapid population and workforce aging. Importantly, the trend toward an older workforce is not just a current but also a future phenomenon; older people's engagement in the labor is predicted to rise dramatically over the next several decades in all OECD member nations. Pension policy changes (e.g., reductions in current incentives for early retirement), anti-discrimination laws, advances in older people's health, public awareness efforts, and increased financial incentives to work longer and at a higher age are the major causes for this trend. Another key factor is the changing nature of job demands; workers may now work longer shifts from physically difficult jobs like mining, construction, and manufacturing to less physically demanding jobs like retail (Tams, Grover and Thatcher, 2014). Increased life expectancies have also had an impact on the aging workforce, with technological and medical advancements helping individuals to remain healthier and productive at an older age. Furthermore, as a result of the diminishing labor supply, there are fewer younger workers in the workplace and a rising number of older workers who are required to work not just to make products but also to support the growth of a late retirement base compared to persons a generation older than them (W Stedmon et al., 2012).

This change in demographic behavior and the nature of labor market, require more attention to the middle-aged workforce when it comes to upgrading their digital skills. Given their great productivity and job experience, and the tendency to work longer that needs to be further enhanced in parallel with technology enhancement (Martin, 2018).

Even though, this group of workforces maintain positive attitudes about ICTs and their benefits, they experience some challenges. Because this group of employees received their technological education when technology was far less complex than today's ICTs. They have operated using out-of-date technology paradigms, thereby, their mental models of how technology works may not be sufficient to support adequate interactions with modern ICT. This idea is supported by the fact that older personnel are less likely than younger workers to participate in training activities to keep their technological expertise current. Changes in personality, sensory ability, and culture are all challenging factors in dealing with the complexity and paradigms of current technology. (Tams, Grover and Thatcher, 2014).

Long-life learning is essential for the middle-aged group to secure their jobs in the digital era, they try to overcome that by upgrading their digital skills noticing the increase in the numbers of this group attending higher educational institutes. However, the digitalization of the academic program is also seen as a challenge for them compared to the campus style they were used to and passed through earlier in life (Arbogast, Cummins and McGrew, 2018). Education and learning are seen to be significant components in helping those individuals to participate in the working environment. Contributing to meaningful tasks is vital for them to adjust to changes in the area of technology, this leads to satisfaction, and productivity longevity (Boulton-Lewis, 2010). At any age, motivation and confidence are essential for learning, but

they are especially important for the middle age group of the workforce (Boulton-Lewis, Buys and Lovie-Kitchin 2006).

Work-life balance is also a challenge, Changes in working life and the workplace posed a challenge to both older and younger workers' learning efforts. Due to rising workloads and time constraints, they had fewer opportunities to learn. In some circumstances, the former opted for an adjustment plan rather than participating in the reforms. Except for memory and learning speed, age had little bearing on how stimulating workplaces were seen as learning environments, nor on subjective assessments of learning attitudes, skills, or motivation. Between sectors and enterprises, there was more diversity. However, older workers, particularly those with higher levels of education and skill, did not always find their work in small enterprises to be as engaging in terms of new learning as their less experienced colleagues did. Learning obstacles in the service sector arose mostly from within the work itself, particularly from customer demand. They were more closely tied to outside influences (e.g., quality criteria, educational reforms, and the labour market) or to technological progress in the industry (Tikkanen et al., 2002). Ambidexterity to manage working and learning in parallel is a challenge but it is required during DT. It is a way to improve the human capabilities, it indicates an implication on the capacity level to handle with the complex working atmosphere. It targets the whole workforce, but it does not explicit how different age groups can be supported toward this strategy (Jackson and Dunn-Jensen, 2021).

The covid-19 situation has influenced the working and learning environment. Managing the new working conditions from home or hybrid by itself created a challenge for the workforce life balance. They are required to acquire new digital skills in a digital atmosphere which they need to adapt quicker than before. E-learning platforms are being designed and adjusted by institutes and experts to ease education, but learners' responses have changed. It is noticed that content delivery is running with a speed but fewer discussions versus face-to-face. Both live and digital learning contexts have advantages and disadvantages, and the adaptability for it is seen as moving in a positive direction. Decision-makers need to factor in the diverse groups to understand how this is affecting the response from learners (Dwivedi et al., 2020).

Prior studies referred to 91% of employees acknowledging that DT will change their work, but only 41% were satisfied with how employers are able to manage this. The concept of DT stands for innovation, workforce needs to manage the ambidexterity in working, learning new digital skills, and exploring to innovate. Working and upskilling digitally in parallel cannot be disconnected, because DT era is about believing that skills, knowledge, ability, and competencies can be and must be built to achieve long terms objectives. HR management needs to further look at assessments to understand the capabilities and how their potential contribution would be. Also, finding good measurement for employees to assess their ambidextrous skills during work to support individuals and employers to plan for meeting the talent's market demands. Aged workforce is part of this process, they are the learning capabilities talented in work experience (Jackson and Dunn-Jensen, 2021).

Right techniques need to be set by managements to handle the increasing number workforce aging and the growth of ICT in the workplace (Tams, Grover and Thatcher, 2014).

## 2.6 Organizational Learning and Knowledge Process

Digital skills relate to technology that is rapidly advancing, therefore digital skills require revision and enhancement throughout the journey. This could be achieved through a feedback loop to ensure all parties are sitting with the same level of knowledge of the learning targets (Mergel, Edelman and Haug, 2019).

Research conducted by Gates and Wilson-Menzfeld (2022), refers to themes and actions to be considered for enhancing the delivery of digital skills learning to older/aging groups. These themes are “negative perceptions of aging; the learning environment; and value of technology”. For the first theme of the negative perception, the action to resolve is providing a learning style that suits those audiences' styles to provide them the best experience. The second theme is about the learning environment, the action needed here is to provide motivation for the learners. The third theme of the value of technology, the action required to achieve this is to define the purpose and need because this group will learn and fit when they understand the worth of using the technology.

The theoretical model of corporate entrepreneurship (Turner and Pennington, 2015) presented in figure 2, describes the prime role of motivation, opportunity, and ability, to drive knowledge sharing, leading to enhance organizational learning, thereby innovation.

Motivation is defined by the readiness to take an action. Opportunity is a presented atmosphere that enables actions. Ability is the capability of performing an action. Large and complex firms require a developed level of innovation from the workforce to success. But, achieving this needs to deal with the ability to adapt, fix gaps, and improve the organization learning.

Organizational learning must be oriented to stand for a long-term to survive the firm through transformations, thereby knowledge sharing needs to be promoted between the organizational actors. This can be maintained by the motivating the employees to exchange and generate knowledge, providing them with a suitable environment to act, and help the workers with access to network so they can engage in the activities of knowledge sharing. Turner and Pennington, 2015, presented MOA framework displaying that motivation, opportunity, and ability as the functional variables of firm that are needed for knowledge sharing, taking them to the process variables where the organizational learning cycle is happening leading to innovation.

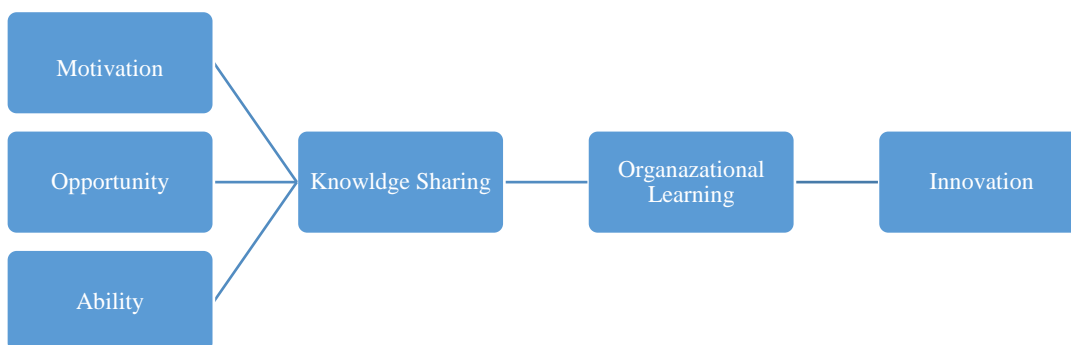


Figure 2: Theoretical model of corporate entrepreneurship (Turner and Pennington, 2015)

According to Buckler (1996), focusing to map a course for the learning Endeavor, with an atmosphere that supports learning, and procedures that enable efficient learning are the three ingredients required for this learning process to be effective. according to the study, successful diagnosis and prioritization of organizational learning needs should be linked to the company's strategy through the policy deployment process and diagnosis should be led by three stages which are defining the process requirements, individual and team assessment, prioritizing learning needs. The economic climate is unpredictable, therefore, it's critical that the ability to improve and innovate outpaces the rate of change imposed on our businesses. Managers must therefore understand the learning process and know how to assist its implementation across all their responsibilities.

## **2.7 Proposed Theoretical Framework**

According to Creswell and J David Creswell (2018), a theoretical lens should be selected to develop the research further. In this master's thesis, the Organizational learning Theory for Argyris and Schön (1997) is selected. The Theory discusses how actors of an organization learn through repeated processes of actions and reflections. Argyris and Schön (1997) refer that Organizational Learning is a realized product when a group or individual contributes to understanding an inquiry and solves it if needed. Argyris and Schon (1997) also made a distinction between two theories, the Espoused Theory, which is the values that people believe in having and their ways of acting following the defined instructions. Also, the theory-in-use is the ways that members behave, which often are brainstormed, implicit, unexamined, and generally accepted.

Organizational Learning occurs as a direct outcome of interaction during the process, and it consists of three types:

- 1) Single loop learning such as when feedback is given to correct the result.
- 2) Double-loop learning, which leads to change in theory-in-use to reach a new set of results.
- 3) Deutero learning when there is a need to develop the learning system itself by understanding the model and the processes to improve.

In this thesis, when the organization is implementing the DT, the organization's learning plays an essential role in this transformation concerning its ability to adapt to the technology and environmental changes and adjust the models of knowledge and actions of actors that we refer to as workforce also as key members to constantly upgrading their knowledge and skills to achieve the objectives of this transformation. This justifies adopting this theory, another reason is the related levels of learnings from the single loop, double loop, and deutero learning are applicable also to the processes implemented in the organization's upskilling frameworks to enhance the capabilities of the workforce.

We intend to use the double-loop organizational learning method because it is related to what we are doing in our research trying to find the underlying challenges and causes that can impact Digital Upskilling in the organization. The double-loop method supports research where you try to find answers to correct the cause of the problem for example Organizational norms, policies, Ways of working, Individual motivation, etc. to impact the long-term success.

In the double-loop method, we are compelled to consider our activities within the context of our operating assumptions. That is significant because we must begin to consider and analyze our processes. "What is going on here?" and "What are the patterns?" are questions we should ask the actors. If we wish to grasp the pattern, we'll need that information. Double-loop learning will help us understand our assumptions better and make better decisions in operations.

### 3. Methodology

In this chapter, a description in detail will be provided of the adopted philosophical tradition and methodological approach. Additionally, the methods of data collection, research settings, and methods of data analysis are also described. The chapter also concludes with the approach adopted to ascertain the validity, reliability, and ethical considerations.

#### 3.1 Philosophical Tradition (Paradigm)

According to Creswell and J David Creswell (2018), there are four world views of research paradigms that involve the general philosophies about what scholars want to contribute to a study.

These paradigms are Positivism, Interpretivism, Transformative, and Pragmatism.

- The Postpositivist Paradigm: It is scientific research and more applicable for quantitative research than qualitative. It is posing a challenge to the conventional concept of absolute truth in knowing and acknowledging that we cannot be completely certain of our claims of knowledge while examining social actions and behaviours. It is based on establishing numerical metrics for observations, and the researcher starts with a theory, collects evidence to support or contradict the hypothesis, and then revises the assumption and conducts more tests (Creswell and J David Creswell, 2018).
- The Interpretivism Paradigm: It is particularly used in the qualitative study, and states that the social reality, including social acts, is the consequence of human effort and can only be understood via human action. This is accomplished through comprehending the subjective meanings and goals of these activities. On a metaphysical level, interpretivism asserts that the social reality in which we live does. It does not exist on its own and is the consequence of collective human activity. As with any social phenomenon is a result of human behaviours, allowing for a thorough knowledge of a social phenomenon. Participating actively in that phenomenon with the individuals who generate it. From an epistemological standpoint, the researcher should adopt the culture's values or by observing them in their usual activities. From a methodological standpoint, case studies, interpretivism, action research, and ethnography are favoured research methodologies (Creswell and J David Creswell, 2018).
- The Transformative Paradigm: It involves the concept that laws did not adequately address issues of social justice and power. concentrates on the problems of disadvantaged groups and individuals in our society. Thus, theoretical viewpoints can be combined with the philosophical assumptions that form a picture of the issues being researched, the individuals being explored, and the improvements that are required. Such as feminist perspectives, queer theory, disability theory, etc. It places a premium on the study of the experiences and feelings of underprivileged communities. For these varied groups, the extent to which their lives have been confined by oppressors and the techniques they employ to resist, question, and undermine these restraints are of particular importance. The research examines injustices in these varied groups based on gender, race, ethnic origin, handicap, gender identity, and socioeconomic background that result in unequal power interactions (Creswell and J David Creswell, 2018).

- **The Pragmatic Paradigm:** It develops because of actions, events, and outcomes rather than pre-existing conditions; and rather than concentrating on methodologies, researchers stress the study topic and question and employ all possible ways to comprehend the problem. It is not bound by any one system of thought or reality. This is true in mixed methods research, in which investigators make extensive use of both quantitative and qualitative assumptions. Individual researchers are allowed to make their own choices. Thus, researchers are free to select the study methodologies, strategies, and processes that best suit their requirements and objectives. It means repercussions, and mixed methods researchers must justify why quantitative and qualitative data should be combined in the first place. Pragmatists believe that research occurs in a variety of social, historical, and political situations. In this sense, mixed methods studies can incorporate a postmodern perspective, a theoretical lens reflective of social justice and political objectives. Pragmatists do not believe in the absolute oneness of the universe. Similarly, mixed methods researchers consider a variety of ways of data collection and analysis rather than adhering to a single strategy (Creswell and J David Creswell, 2018).

This study falls in the Interpretivism Paradigm, this type of research is increasing in the field of information systems, and it is becoming more vital early in the 1990s (Walsham, 2006). The related ontology is that social reality and produced by people, it may be identified by the individual in the group as part of an event. The related epistemology is because we gain knowledge through interpretation with people as it cannot be measured in an objective way. This paradigm is chosen because we aim to study a phenomenon DT through people's points of view based on their different experiences in a social context (Creswell and J David Creswell, 2018). According to Walsham (2006) there are four important elements to be factored in the interpretive research: choosing the involvement style, maintaining, and gaining access; collecting the data of the field; and working in several countries.

### **3.2 Methodological Approach**

According to Creswell and J David Creswell (2018), different research problems require the use of different research methods, based on the level of complexity and context of the problem. The research methods can be divided into three categories, quantitative, qualitative, and mixed methods. Quantitative methods are used to test a theory or an explanation, to identify the actors and the factors that affect an outcome, to test the utility of an intervention, or to predict its result. Qualitative methods are used when important variables are unknown to the researcher, the topic is unexplored, a certain sample group has never been addressed within the issue or the known theories cannot be applied to a certain group. Mixed methods are used for the generalization of the findings to a population or when a detailed view of social phenomena is needed. Based on the research problem and research questions addressed in this study, the qualitative method is the best approach to answer these questions. The research design would be a qualitative study to understand the pattern of behaviors and actions for groups that are sitting in the same cultural settings. Our goal is to gain better knowledge about the experiences and challenges related to the upskilling of digital skills in the DT phenomenon from the point of view of the human workforce among specific age groups working in the same units (Creswell and J David Creswell, 2018).

### **3.3 Methods of Data collection**

Interviews are keyways in interpretive studies to access the interpretations and information (Walsham, 2006), Our selected method of data collection in this study will be semi-structured interviews. Interviews can be carried out one-on-one or in groups and they can be conducted face-to-face, by telephone, or by email. (Creswell and J David Creswell, 2018). In our research, the data is captured through conducting one-to-one semi-structured interviews with staff who are working in finance and supply units in ICT companies in Sweden, exposed to the DT digital upskilling initiatives, belonging to the middle-age group, and who have accepted to be part of this. It is a valuable method to obtain insights from the staff's perspectives and to learn more about their experiences, perceptions, and responses. The questions were open-ended to gain as much qualitative data as possible. The convenience sampling method was used, including individuals who happened to be most accessible to the researcher (Creswell and J David Creswell, 2018).

We have ensured the participation of candidates through a proper invitation process and reminders were send when needed. As in qualitative studies, it is not about the number of interviews but about the richness of the data collected to achieve the saturation level. In the qualitative study, the sample size needs to reflect the purpose of the study (Creswell and J David Creswell, 2018).

The invitations were sent to a list of 20 participants that met the criteria of the study via email and verbally, reminders were sent periodically to ensure higher participation. Due to personal reasons, 2 participants did not accept to be interviewed, and 3 participants did not respond.

The invitation letter was highlighting the topic of the study, purpose, information about the interview duration, voluntary participation, and the confidentiality of the collected data. Added in Appendix 2.

An interview guide was developed consisting of open-ended questions covering the different topics addressed in the research study. Each interview was designed to take approximately 30 minutes. Based on the acceptance of the participants, the interviews were recorded for further data analysis purposes, after receiving their consent at the beginning of the recording. Considering the covid-19 situation that enabled flexibility of remote working, the interviews were held through face-to-face, video calls, or voice calls, depending on what condition suited the participant. Interviews were held in English.



### 3.4 Interview Process

Interviews were conducted via video calls or face-to-face which was the most convenient for them. All interviews were done during suitable hours and a meeting invite was sent after agreeing on the time slot given by the participant and with their consent. The informed consent form is added in Appendix 3. Interviews started taking place from 17<sup>th</sup> April 2022 until the 3<sup>rd</sup> of May. Interview questions are added in appendix 2.

#### Interview Strategy for Supply and Finance Employees

No. Of Participants: 15

Supply roles interviewed:

- Supply chain manager
- Demand Planners
- Project Managers
- Production Leaders
- Capability Planners
- Product Managers
- Line Manage

Finance roles interviewed:

- Financial analysts
- Controllers

### 3.5 Method of Data analysis

For a qualitative study, thematic analysis is one of the common methods used for the interpretation of qualitative data. Lichtman (2014) has mentioned the six steps of thematic analysis which are referred to as the 3 Cs (Codes, Categories, and Concepts) of data analysis. the six steps in the thematic analysis of qualitative data are shown by Lichtman (2014, pp. 14) in figure 3.

**Initial coding:** The initial coding process begins with a thorough review of responses, followed by a summary of these concepts in one's own words, phrases, or codes.

**Revisiting initial coding:** The next phase in the analysis is to remove redundant codes, rename synonyms, and make the codes consistent after summarizing or coding each response.

**Developing an initial list of categories:** The third phase in Lichtman's (2014) Thematic analysis is to identify sets and subsets of related codes, as well as to assign a suitable category to each subset.

**Modifying your initial list of categories:** Step 4 of thematic analysis involves revisiting the categories found in step 3 and determining whether related categories may be combined into a single set or subset. In this phase, categories can also be sorted in order of importance based on the number of times they appear in responses.

**Revisiting your categories and subcategories:** This step entails removing superfluous categories and selecting essential criteria in accordance with the study's objectives.

**Moving from categories to concepts:** Identifying important concepts that reflect the meaning of acquired data is the final step of thematic analysis.

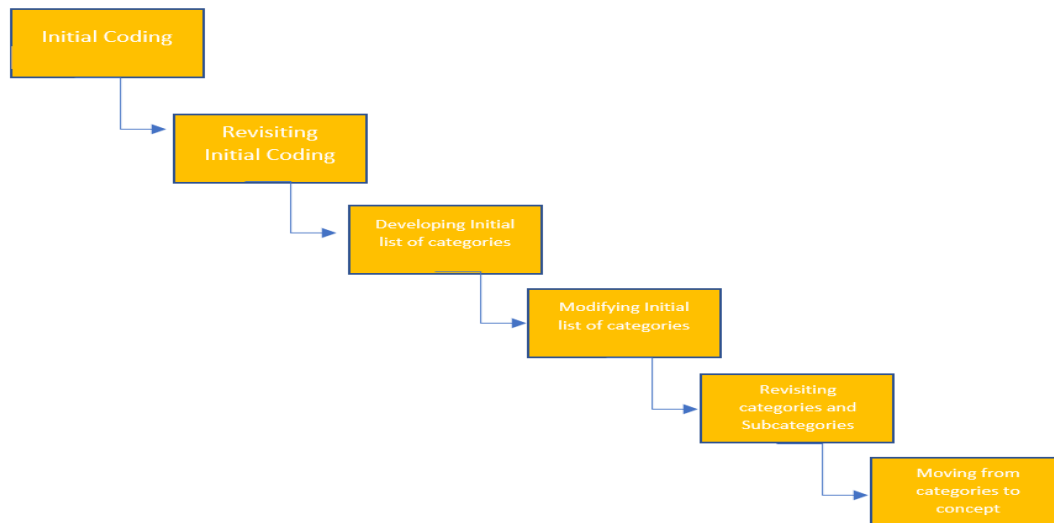


Figure 3: Six steps of Thematic analysis, Adopted from Lichtman (2014)

A semi-structured interview approach was used to collect primary data. The first stage of the analysis was to listen to interview recordings frequently, transfer this to written text documents, and then assign codes to each phrase. These codes represent key phrases used by respondents that are relevant to this study. Coding was an iterative process that was finely tuned with each reading until all interviews were encoded.

We have assigned 75 codes to all relevant materials, which were reviewed for frequency and classification. Similar codes were grouped together into 18 categories. These categories are converted to 5 concepts as a final step for this study as presented in appendixes 4 & 5.

### 3.6 Validity and Reliability

The goal of qualitative research is to make sense of and recognize patterns among words in order to create a meaningful image that is both rich and dimensional, in contrast to quantitative research, qualitative research is concerned with non-numerical data and is based on interviews. Human perception, sensibility, and subjectivity are all part of the human experience.

In qualitative research, validity refers to the "suitability" of the instruments, methods, and data (Leung, 2015). It can be accomplished by ensuring that the research question is valid for the desired outcome, as well as selecting the appropriate methodology and data analysis tools to answer the research question.

In quantitative research, dependability refers to the methods and outcomes being able to be replicated exactly (Leung, 2015). It means that the same result can be obtained by performing the same task several times using the same tools. Because of the various paradigms used in qualitative research, achieving reliability is a difficult challenge. Credibility, Neutrality or Confirmability, Consistency or Dependability, and Applicability or Transferability are qualitative words that are similar to the quantitative term's reliability and validity (Appleton, 1995).

## **Credibility**

A qualitative study is considered credible if it reveals accurate descriptions of individual experiences and "that the people having that experience would immediately recognize it from those descriptions or interpretations as their own," according to Sandelowski (1986, cited in Appleton, 1995, p.995). The researcher defends its credibility or trustworthiness through practices such as the researcher's influence on the research (reflexibility), using multiple methods to answer the research question (triangulation), and providing a detailed description of the interpretation process. The researchers have made sure that participants have the proper understanding of the questions and reviewed the outcome with them to ensure the trustworthiness of the research (Creswell and J David Creswell, 2018).

## **Neutrality**

In the research process, neutrality or confirmability refers to the absence of bias (Sandelowski, 1986 as cited in Appleton, 1995). Throughout the data collecting and analysis procedure, the researcher attempted to maintain objectivity and avoid expressing personal opinions. The study's neutrality is ensured by following all necessary data gathering and analysis stages.

## **Consistency**

Appleton (1995) defines reliability as the degree of consistency or dependability. The goal of qualitative research is to emphasize the uniqueness of each circumstance and the significance of human experience in that setting, which may not be repeatable in the same way that quantitative research does. In qualitative research, consistency is measured by the stability (Creswell and J David Creswell, 2018).

## **Applicability**

The generalization of findings on the same issue is referred to as applicability or transferability. For a qualitative study to have relevance, Appleton (1995) contends that the descriptive interpretation of data analysis should extend to other fields. To ensure that this study's application for external validity, a convenient sample approach was utilized, and respondents that met the criteria for the research were chosen from a variety of job profiles within Supply and Finance units, mixed ages within middle-age group, and with different years of professional experience to ensure that diverse opinions on the topic were represented.

The researchers took all precautions to be objective and not affect the participant's speech. A pilot interview was conducted to obtain clarity and standardization in the interview process. To enhance the reliability of the study, a cell phone was used to record two interviews and hand notes were recorded for the rest (due to participants not agreeing to the recording). Participants were asked about their opinions and perceptions to answer questions during the interview. Subjects were created and reviewed after data collection by referring to interview and questionnaire data regularly to determine the suitability of the research. Then, the conclusion and data analysis were presented to the participants to obtain feedback.

### **3.7 Ethical Consideration**

Throughout the study processes, Ethical consideration were factored to maintain the authenticity and avoid any misconduct (Creswell and J David Creswell, 2018), the below ethics were considered for the interviews:

- Participants were given consent to participate, and have the right to withdraw from, or refuse to take part in this research project.
- Confidentiality and identity of the participant will be protected, and the result will be shared as anonymous.
- All data captured will be handled based on the GDPR regulations.
- Recorded and collected data will be destroyed after capturing all information.

Appendix 3 includes the informed consent form.

## 4. Empirical Findings

In this chapter, the empirical findings from the interview analysis are presented. This chapter concludes the detail description of identified Concepts from interview data analysis.

### 4.1 Empirical findings

Based on the analysis 5 concepts were generated to provide meanings to the gathered data. The identified concepts are:

1. **Embrace digital transformation:** this concept is connected to open to change, willing to contribute, awareness of digital skills categories.
2. **Incentive and Recognition:** this concept is connected to incentives for learning, monetary benefits, career growth categories.
3. **Organizational Communication:** this concept is connected to lack of communication, purpose, and vision not clear, fear of automation will reduce jobs, missing change management categories.
4. **Working and learning in parallel:** this concept is connected to prioritisation between working and learning, performance pressure, high commitment to family time, aging factor, job security categories.
5. **Customized Digital Upskilling programs:** this concept is connected to learning program based on skillset and experience, varied pace learning program, Hybrid Learning model categories.

### 4.1.1 Embrace Digital Transformation

It is awareness of this transformation, seeing the need for it, openness to adaptation, understanding the benefits, and willingness to be part of it.

Our findings are all the participants have heard about DT and mostly at work from presentations, and lectures but there are some who knew it besides that through other sources such as newspapers, the internet, social media, LinkedIn, and online courses

Participant 1 stated *“At work, training sessions, people, knowledge sharing, reading newspaper and media to keep track on what is happening, curiosity”*.

Participant 6 said *“work, reading newspaper, commercial, and in social media”*.

The analysis done is confirming that all participants are seeing the advantage of DT in the ways of working in supply and finance functions, regardless of the status of current contribution or existing challenges.

Participant 10 stated *“Definitely. Digital transformation is fundamental for any company to simplify the daily operations but also to increase the resource efficiency”*.

Participant 2 stated *“yes, due to growth of data that needs analysis for professional conclusions, reduce manual tasks, and connect data from different sources”*.

Participant 4 stated *“yes, because data will be more accurate and better visualized, enable seeing the big picture with data growth, ease of monitoring changes, and reduce manual work”*.

Participant 12 stated *“Absolutely. We are implementing a lot of good things but perhaps we are not so well coordinated, and a lot of things developed are not deployed in a wide scale”*.

Participant 6 stated *“yes, it simplifies the work, but contribution is still limited from my end”*.

Participant 13 stated *“Yes, there still many things done manually”*.

Furthermore, many raised problems in the core tasks performed by the participants in their units that are seen potentially to be solved according to their views.

Participant 14 stated *“Better forecasting, better planning with reduced scrap, reduced tied-up capital in in- and out-bound buffers, overall better resilience in our supply chains, less stress in the organization, more time for employees to work on improvements and innovations”*.

Participant 1 stated *“Keep track on data and easy extraction, get a clearer data understanding and the ability to combine different data set from different fields together. Ability to do smart analysis. Cross analysis of different sectors. Maintain access rights and confidentiality”*.

Participant 9 stated *“Production plan that is on excel or anything follow ups that are currently on excel format. Excel formats are locally stored and needs to send or upload which is inefficient”*.

Participant 13 stated *“Transparency so more people could have access to needed data. Efficiency, if we can make certain data available in reports or dashboards. More fact-based decisions”*.

Participant 15 stated *“Easier, quicker and real-time access of information. Reduce manual work. Better tool for analytic works”*.

Participant 10 stated *“Supply Lead Times Material Scraping Excess Procurement Product Forecast Material Planning Issues Customer orders processing”*.

Participant 5 stated *“Human errors, managing data complexity”*.

Participant 6 stated *“Removing the routine work, if implemented correctly it will reduce the human errors, efficiency, add more valuable work”*.

Participant 11 stated *“Data based decision making, preventive maintenance, accurate stocktaking, predictable supply chains, enhanced collaboration, automation, lack of sufficiently skilled workers”*.

The average years of experience spent by the participants working in supply and finance functions are 22 years, combining those who have always been working in these fields with those who have moved because of a career shift. From the answers, it is noticed that the transformation concept is not new, whether on the IT level from used systems development or organizational/company levels, or both. They have this experience, and they are open to passing through it again.

Participant 15 *“I believe high portion of education is needed for employee to increase digital skills and embrace new technology to get maximum output of new”*.

Participant 2 stated *“Several transformations, for example major IT one when getting an IBM PC, then saving the data from PCs to servers, then having internet, and so on”*.

Participant 3 stated *“4 major, especially when performing period end closing in the past using old tools and then having different systems such as scala, i scala until updated version of SAP today”*.

Participant 1 *“12 transformations in IT such as changing to SAP, new systems, agile work, and SOX”*.

Contribution to this journey, and the participants' desire to put their experience in, was stated in the analysis of the answers on what they can present.

Participant 5 stated *“Experience, wisdom, good evaluation and leadership insights”*.

Participant 3 stated *“Work experience, knowing what needs to be achieved”*.

Participant 4 stated *“hard to help from digital tools perspective but more on leading the overall set up, team and drive longer terms goals. Most important is to integrate experiences between different groups”*.

Participant 1 stated *“Experience, work consultancy expertise”*.

#### **4.1.2 Incentive and Recognition**

The analysis of the responses indicates that participants seek motivation at work to learn new digital skills. The employer has a mission to encourage the staff to learn digital skills which can be introduced in several ways such as incentives in a monetary form, certificates, job upgrades, or in rewarding forms.

Participant 10 stated *“Promotion, Salary increase, recognition”*.

Participant 11 stated *“incentives, rewards, salary, games for most courses done or something”*.

Participant 5 stated *“Pointing the benefit and highlighting the value recognition, promotions that could be associated with incentives”*.

Participant 8 stated *“Realization of necessity of learning play vital role and Reward and recognitions can serve the purpose very well”*.

Participant 14 stated *“A Diploma could work well to certify training programs gone through”*.

Participant 6 stated *“clearer direction on the tangible outcome”*.

Participant 2 stated *“Curiosity, Learning new things, job satisfaction, promotion and career growth. It gives a positive feeling”*

The analysis also indicates that participants are more encouraged to learn when learning target and connecting it to work are provided, also they need feedback:

Participant 13 stated *“put up targets for learning and make them equally important to your performance”*.

Participant 14 stated *“If provided by goals and all improvements that comes with digitalization that is a motivation for many. Working always has meant to learn new things, that is the fun part of it.”*.

Participant 3 stated *“Feedback, not only the salary you need to enjoy what you are doing, job satisfaction, having an open-minded teams and discussion”*.

Participant 15 stated *“important to enable time for digital upskill”*

Performing the job itself in a better and smarter way is seen as a motivation.

Participant 4 stated *“Increasing knowledge and efficiency at work resulted from using the digital skills”*

From the answers, it is understood that even though participants need motivating factors from the employer, they also have a self-driven individual desire to expand their horizons, obtain a new digital skill that is the language of the current era, and keep themselves updated with the latest changes.

Participant 1 stated *“The outcome from simplicity and knowledge increase. Motivation is individual, for my it’s not important for my CV but I want to learn to gain more educational insights about digital tools, I am interested and curious to learn.”*.

Participant 9 stated *“The motivation could be that Digitalization is inevitable. You need to adapt and learn the new skills compared to how you have learnt to use a smartphone”*.

#### **4.1.3 Organizational Communication**

Management plays an essential role when implementing fundamental changes in the organization and adopting a new strategy which is DT in this study. A key aspect for the management to look at is how to enable employees to respond because they should be the main supporters of the implementation processes, so it becomes successful.

The employees during this transition are needed to improve their digital skills to adapt to new technological tools which have started or are to be used for performing the tasks.

The analysis of the answers showed that participants demand enabling factors from management to ease this digital skills development.

Participant 15 stated *“People and culture”*.

Participant 7 stated *“Implement where needed, not everywhere, start small and evolve it, Get feedback from those affected”*.

Participant 5 stated *“Take decision on what employees should focus on because addressing high level message about learnings may reduce motivation”*.

Participant 9 stated *“the first step must be that management level are willing to invest on the resources”*.

Clear communication on what to learn, why to, and what will happen, are repetitive requests noticed in the analysis.



Participant 3 stated *“Communicate the clear vision, not to ask many things and trainings at the same time”*.

Participant 4 stated *“More communication and sharing of successful stories”*.

Participant 13 stated *“1) Change journey and communication about what we are doing in this area. We get some newsletter from time to time but live presentations are better. Clear purpose of what problem we are solving. 2)Deployment takes time and need allocation of time. Many good initiatives never flies because we miss the deployment part. 3)Change agents or ambassadors in the organization. People who can hands on help the different units to start using the data available”*.

Participant 11 stated *“Communicate the benefit based on audience knowledge level, involve the user and stakeholder as early as possible, factor for learning curve, create incentives for knowledge gain, motivate and reward pioneers”*

Participant 6 stated *“Transparency on messages, provide a value and not just to add a task. There is a need to express the purpose, introduction on why, there are a lot of talks but lack of facts”*.

Participant 15 stated *“Important to show how the learning can be beneficial/ help you to become more efficient in current work”*.

What will happen to the roles, tasks, and jobs, needs to be communicated, the analysis resulted that, participants have a vision of the future related to this topic but there were different opinions given.

Participant 1 stated *“It’s not a reduction of jobs but roles will change”*.

Participant 14 stated *“It will affect the amount of work in different job roles and people may need to move around in the organization, but more time can be spent on improvements, innovations. Workloads can better be even out. But whenever there is an efficiency gain proved over a year or two there will of course always be unsentimental forces within a company to do more with less”*.

Participant 13 stated *“Not immediately but long term I think jobs will reduce and should be, otherwise this is a very costly initiative without payback”*.

Participant 9 stated *“Many people tend to say no and explains like the digitalization will not reduce jobs but instead only changing the way your work. I don't believe that. With digitalization I believe we can have automated processes which results to some jobs will be obsolete”*.

Addressing the learning of digital skills needs to be guided, the given answers have covered these notices.

Participant 4 stated *“Need for a clear guideline about the purpose and direction rather leaving it to personnel, free up time”*.

Participant 10 stated *“Focus on problem statement Arrange proper trainings”*.

Participant 2 stated *“Create opportunities to practice the learnings”*

Participant 3 stated *“Dedicate special groups to drive it”*.

Participant 11 stated *“Predefined learning schedules”*.

Participant 1 stated *“Need for a clear message from management about what to learn. Receiving clearer guidelines”*.

#### 4.1.4 Working and Learning in parallel

Employees are asked to improve their digital skills which are in working demand, this doesn't mean stopping performing the task of their job that is essentially important as learning. From the answers and the analysis, it is understood that employees face challenges in achieving this.

Allowing the time to learn at work is a great facilitator as understood from the collected statements.

Participant 1 stated *"Empty time for employees to learn"*.

Participant 10 stated *"Dedicated budget and time for learning"*

Participant 7 stated *"Time allocation by manager and support from management"*.

Participant 11 stated *"good time management from individual"*.

Participant 14 stated *"A training program is an overtime assignment to allow ordinary job in parallel with training"*.

Participant 13 stated *"Mostly I would say it is a time issue. If we you target to fulfil that is the basis for your judgement about work performance, it is easier to prioritize those before increasing your knowledge"*.

Participant 12 stated *"It's hard to share my time between family, work, study"*

Priority and interest are also important, and its different for the participants.

Participant 9 stated *"Prioritisation of learning over work"*.

Participant 10 stated *"Taking out time from regular activates/family engagements for upgrading skills"*.

Participant 3 stated *"different priorities, moving to different life values"*.

Participant 13 stated *"As it is up to the individual to be responsible for his/her learning, it might get down prioritized due to urgent issues coming from management or other important stakeholders"*.

The concept of working from home during Covid-19 situation, and the new rules of Hybrid module of working, some of the participant indicated this as a challenge.

Participant 8 stated *"During WFH scenario it's hard to concentrate on learning"*.

Age has been referred to as a slowing factor for a small portion of the participants to develop their digital skills as the management target all employees who are diverse in age.

Participant 6 stated *"Age, keeping up learning all time, younger people have fresh competence priority challenge, interest. Also, the older feeling less experienced in fresh technology. Richness of working experience but warned out to change. Not afraid to change but too many happening overtime"*.

Participant 2 stated *"Age, the older the slower to learn"*.

Participant 3 stated *"yes, age as skills go slower"*.

Participant 5 stated *"ability to grasp the change, being slow with age, different life priorities, hesitation by getting older"*.

Digital tools are also a topic of concern and creating a challenge when learning new digital and working in parallel as per the answers given by some of the participants.

Participant 3 stated *“its vastly changing and risk of being outdated quickly, time, level of complexity, ways to handle”*.

Participant 5 stated *“its quickly changing that continuously we here about new initiatives. Different opinions on which is suitable to work with”*.

Participant stated, *“Its complex”*.

Participant 12 stated *“I don't really see why we all are pushed for learning digital skills, digital tools are complex and needs experts to handle”*.

Finding the right training to fit into the purpose of improving the digital skill to help in more efficiency at work, with opportunities to practice and getting a good support are seen reflected by some of the participants when focusing on doing their jobs in parallel.

Participant 13 stated *“A lot of learnings are launched but to know I need for my job role is not easy”*.

Participant 1 stated *“Getting support from professional consultants that answers learners' questions”*.

Participant 11 stated *“doubt in people whether this is the correct path”*

Participant 4 stated *“we need subject matter experts in each unit”*.

#### **4.1.5 Customized Learning Programs**

Employees in the same units vary, such as job tasks, age seniority, used systems, level of knowledge, interest, competencies, and digital skills. From the analysis of the provided answers, it is found that participants find a need in designed digital upskilling programs rather than learning it generalized. From the analysis of the responses, it is understood that participants see the need for customized training, and different opinions were provided on how this can be implemented.

Some have connected it with age and justified that.

Participant 2 stated *“yes, by the age you get more chances to take higher and more responsibilities while young people have a fresh experience”*.

Participant 6 stated *“yes, between recently graduated and senior people due to experience, people can segment themselves”*.

Participant 8 stated *“Yes, depends on capabilities to learn and implement there should be segmented approach”*.

Experience, Skills, and interest are also presented in the answers as important factors and did not see age as an obstacle.

Participant 1 stated *“No, it's not the age but based on experience and interest”*.

Participant 3 stated *“It is not the age, but it's connected with interests as it is different between personnel, trainings could improve and be designed differently”*.

Participant 13 stated *“not based on age rather based on existing skills. Some people are more advanced than others so having some classification such as Basic, Medium, Advanced would help to put the upskilling at the right level for the audience”*.

Participant 5 stated *“not really an age thing, but rather the interest, it is important to understand the audience and match it with their requirements and interests”*.

E-learning platforms are seen to be delivering good contents and mostly flexible in use by all participants, but this is still not sufficient as a method of improving digital upskilling. For the analysis we find that participants require more interaction with expertise people to learn, and to get a live sessions opportunity.

Participant 4 stated *“they are good but it’s hard to know which one to choose, also the lack of practise”*.

Participant 6 stated *“Sometimes, we need an improvement and learning should be more interactive”*.

Participant 12 stated *“Depends on the aging group, for younger generation E-learning might be enough but for older generations it is not”*.

Participant 5 stated *“This group need to interact with people to train them what to do and be supported with subject matters experts”*.

Participant 11 stated *“In my opinion classroom trainings are more efficient”*.

Participant 13 stated *“Interactive training where you have the possibility to ask questions should be a complement to some of the trainings”*.

Participant 1 stated *“Yes, but we need a super used to help when we are practising”*

Participant 14 stated *“This should be complemented with class-room training as well, digital upskilling needed is big”*.

Suggestions by the participants were given, the analysis of the answers states a vision on how working and learning digital skills can be achieved.

Participant 12 stated *“hybrid models to support different groups”*.

Participant 14 stated *“A training program over longer period to allow ordinary job in parallel”*.

Participant 10 stated *“Learning sessions in office or a learning week”*.

Participant 11 stated *“factoring learning into job assignment by manager”*.

Participant 1 stated *“It is good when there is a team of employees with mix high skills work experience and high skills digital experience”*.

Participant 3 stated *“The requested learnings need to be integrated to work and we need to be able to practise when doing the job”*.

Participant 8 stated *“Improve the working environment and dedicate learning resources”*

Participant 2 stated *“Knowing its mandatory, learning in social context and as a team”*

## 5. Discussion

In this Chapter, the relevance of five identified concepts during data analysis is discussed thoroughly in connection with existing literature, also, as how these concepts answer the research questions and are connected with the theoretical framework. This section ends with the proposed framework.

The First research question is answered by concept 1 of the empirical findings, and the second research question is answered by concepts 2,3,4 and 5, represented in table 2 below:

Research Questions	Findings
RQ1: What is the employee mindset during the digital transformation journey within the organization?	Concept 1 : Embrace Digital Transformation
RQ2: What are the challenges that employees from the middle-aged groups experience during the digital skills upskilling programs?	Concept 2: Incentive and Recognition
	Concept 3: Organizational Communication
	Concept 4: Working and learning in parallel
	Concept 5: Customized learning Programs.

Table 2: Finding overview.

### 5.1 Concepts in relation to Research Questions

**RQ1:** What is the employee mindset during the digital transformation journey within the organization?

#### Embrace digital transformation

The outcome of our interview analysis found that participants are aware of different digital skills and are open to learning. They can identify several benefits that can happen within the organization by the successful execution of DT, those people have gone through several transformations in past, so they understand the importance and the need for in the new digital era and are open to contributing. This is connected with Jackson and Dunn-Jensen (2021), research that the majority of employees acknowledge the importance of DT and believe that it will positively change the way of working. Furthermore, the Covid-19 pandemic provided them with a life example experience of why digital skills and digital learning becoming more essential to survive and stay relevant in the job (Dwivedi et al., 2020).

During interviews, the employees have given several examples of how digitalization can help supply and finance units either its forecasting and planning use cases, increase accuracy, removal of redundant tasks, and solving complex supply chain issues. This is in line with the literature mentioned about how the effective use of Supply chain integration with data can help strengthen inventory management, forecasting, and replacement in the supply chain. Also, how automation and advanced analytics would solve issues and reduce the time of the mundane tasks in the finance function. This explains that middle-aged group workforces have a good understanding of digitalization and how it can impact respective units (Lu, 2021) (Gullers and Gref, 2021).

Additionally, our study emphasizes that middle-aged employees have a positive attitude toward ICT (Tams, Grover and Thatcher, 2014). They have awareness of these digital skills as they have already read about them in online videos, social sites, papers, and workplaces (Gates and Wilson-Menzfeld, 2022). They are willing to participate; their contribution is not only limited to the area of developing their digital skills but also extended to providing solutions based on their rich working experience to drive and mentor teams to walk through it. This group was able to identify areas of improvement for the management to consider for successful digital upskilling programs (Mgiba, 2019). This group is willing to adjust when the right environment is afforded, they already started to attend learning programs to strengthen their ability to deal with new technology (Arbogast, Cummins and McGrew, 2018).

Connecting this with the literature of this research, we find it in line with Boulton-Lewis et al. (2006) argument about the interest of the aging group to learn about technology despite prioritizing other interests of safety, health, leisure, and transportation. They are driven by a strong desire to learn and master new skills continuously. They do acknowledge that learning new skills will enhance their performance and extend their ability to stay longer in their career (Wahab, Rajendran and Yeap, 2021).

Learning and knowledge expansion is highlighted by the participants also as self-driven initiative. There is an interest to upskill themselves and learn more about technology. This relates to their awareness of the need, and curiosity to stay relevant and be up to date with the ongoing changes. There was an agreement in the answers on the openness to learn and upskill digitally, some viewed it as beneficial in their personal life as well. Our study indicates, this group fulfills an important factor needed for a complex organization's learning and knowledge sharing, that is, "Ability" (Turner and Pennington, 2015).

**RQ2:** What are the challenges that employees from the middle-aged groups experience during the digital skills upskilling programs?

### **Incentive and Recognition**

In our interviews, we found that participants understand their need to learn new digital skills to secure career proficiency (Mgiba, 2019). But they want their organizations to improve the incentives and strategies for learning. The organizational approach to offering a promotion, direct growth, practice opportunities, certificates, and salary increases is seen as limited. Such considerations would increase their motivation to learn new digital skills. The human Resource team should create monetary and non-monetary incentives for employees who proactively acquire digital skills that can promote and contribute to organizational growth. Developing incentives and linking them with digital upskilling programs will support their motivation to see direct benefits of it in their professional career and personal life and they will be able to prioritize it (Schwarz Müller et al., 2018). This also is in line with Turner and Pennington (2015), that motivation is needed to drive learning behaviours in the organization. There is a positive relationship between both, associating incentives with different experiments can provide successful results for an organization. Therefore, firms need to imply incentives to generate a full flow of knowledge exchange. This would create value for both employees and employers.

Another motivating factor raised by the participants is receiving a well-defined purpose and guidelines for learning new digital skills in their units. Yes, they believe in the benefit in a general term, but they want the management to narrow the picture and make a direct connection

in how their time spent in developing certain digital skills will help them in better performance on the day-to-day tasks. Digital skills are a wide scope and the digital tools to be learned are many and developing quickly. The pain point from participants stands in a series of questions, which digital skills or tools are to be learned? which of these digital skills are matched with their interest? How can I directly connect it to a tangible outcome at work? What would I get in return? This group sits with a higher level of wisdom and experience than the younger, they are better able to assess what needs to be achieved and are aware of what they need to move on. This statement is supported in our literature (Gates and Wilson-Menzfeld, 2022) that enhancing digital skills requires providing a suitable culture for learners to motivate in their experience, also defining the purpose and value of learning technology. Because they will adapt faster to learn when the reason is justified. It is also, supported by Turner and Pennington (2015) study about the importance of providing “Opportunity” which is an environment that enables learning digital skills. We may relate this to the participant's concern on how to practice the new learning, so they find tangible results and purpose.

The Participants want their learning progress of the digital skills to be assessed, this will help in understanding their digital skills gaps or recognizing their development in a formal and professional way. They need to have an identified target so it can be measured and recognized in the examples of career promotions and diplomas. According to their views, this area requires more attention as it slows down their speed in acquiring new digital skills. Thereby, managers and talents managements need to develop a dedicated performance assessment for that to inspire the employees during their learning journey and direct them to the next steps based on their individual needs (Jackson and Dunn-Jensen, 2021).

In our study, we found that employees in middle age have different priorities in life, with their fair long years of experience it is not just about achieving the career aspiration but also dealing with personal life and interest. Their time is highly valued, and they want to secure the right investment of it between work, family, health, and well-being. Improving digital skills is a matter of prioritization and must connect with motivation. This is in line with our literature, when Boulton-Lewis, Buys and Lovie-Kitchin (2006) referred to motivation as a prime driver for learning at any age, especially for elderly people concerning technology. This group highly appreciates the quality and value- add activities, thereby, motivation is key for them to learn (Boulton-Lewis, 2010).

### **Organizational Communication**

Another concept that we defined from our interview answers is the challenge of lack of clear communication from the organization. People have shown a pattern in sharing this with us that they have several unanswered questions, and they lack clear answers during the DT process when they must learn new digital skills. People referred to no clarity on how the latest changes will impact their roles, what is the expectation from them, and what level of expertise they should develop in those skills. They view messages addressed to them covered in general and high-level which makes it harder to connect and demotivate them in certain cases. There is concern that some of the digital tools are being swapped out quickly, so they need deeper visibility on which are going to stay for a longer period. This relates to Wahab, Rajendran and Yeap (2021), literature that upskilling and reskilling are components for increasing the loyalty of employees toward firms. Transparency in answering employees’ concerns will boost the relationships internally in the organization and externally with customers.

Also, given that technology is quickly shifting, the leaders and HR need to support employees with clear directives on what is needed to learn in supply and finance job roles. They need to

narrow the addressed scope for the workforce and inform clearly about what should be in focus when it comes to expanding digital skills, and this is supported by several pieces of literature in our study (Lim et al., 2020) (Deloitte, 2022) (Lu, 2021) (Yanamandra, 2019).

Participants also highlighted the fact companies take one common approach and try to make changes in all parts, however upskilling of digital skills programs should be done in a focused manner, priority, and should be given to roles that can impact most. It is not enough for them to receive main messages through emails or via internal websites, but they believe that it could be enhanced further because not everyone in the same unit is performing the same tasks. Here comes the role of leaders in spreading communication that can influence employees in an effective way. Also, including instructions that can be practically followed and not just articles to read (Vial, 2019).

The analysis stated that participants are uncertain about the future of their roles, they believe that transactional tasks will disappear by automation which reduces the volume of tasks. But some of them have linked that to future job obsolescence while some see the potential for new roles or tasks to appear. Management can play a role in communicating further in that area, rather than leaving it to the individual to assume a positive or negative future for their work. They acknowledge that companies will hire new talents from the market and universities who come with the latest academic knowledge in that field. It's also very clear that many organizations are not able to define DT clearly to employees, and what its is long-term impact on people. This explains the challenges that people feel when they are in the middle-age group and the need from the management to make imperative decisions and explain further towards employees to gain their commitment. Communication needs to clear out the concern about the employee's career future. The purpose of upskilling and reskilling is to avoid job obsolescence, employers need to address clearly this to boost the energy at the workplace and gain the individual's loyalty (Wahab, Rajendran and Yeap, 2021) (Schwarz Müller et al., 2018).

Feedback is important for the participants, and they see it as limited. They appreciate leaders allowing channels for two-way communication while they go through digital skills programs. They see it as a powerful method that helps them to achieve progress and understand their current levels. Also, they can use it to post their opinions about pain points or improvements needed for learning based on their experience. This group wants to help the firm to evolve and with their expertise they want also their voice to be heard. They are eager to understand clearly the wanted vision so they can take action in parallel. Digital skills learning is part of the organization's learning where effective communication is essential for knowledge expansion. This is in line with Mergel, Edelmann and Haug (2019) study, that a feedback loop is important, all actors involved need to have the same level of information about the learning target to allow quick revisions of the process to keep it relevant (Buckler, 1996).

Communication takes a key role in creating a culture based on empathy, it helps in developing growth mindsets which are highly needed for the workforce in the digital era. Participants aspire to a closer connection with their firms, they want to educate further their digital skills, but they need clear communication to guide them in the right direction (Trenerry et al., 2021). They are the group of workforces that continue to be highly valued in the competitive industries as their expertise can help in managing global crises, and they aim to stay longer in their jobs (Martin, 2018) (Thun, Größler and Miczka, 2007).

In our literature review, Jackson and Dunn-Jensen (2021) study, presented that more than 50% of employees were unsatisfied with how management can drive DT, this could be partially



solved by and explicit communication. Another study mentioned the importance of the role that firms play in enabling individuals to successfully upskill themselves. Not only just to enhance the human capability performance but also to secure achieving longer terms of business continuity, reduce cost, and respond better to the changing external environment of customers, vendors, and new technological systems. Therefore, the relationship between the employer and employees needs to be built on clear communication, vision, and empathy, especially during transformations to ensure that all parties are taking the wanted roles in it (Mgiba, 2019).

### **Working and Learning in Parallel**

This concept highlights one of the major challenges that participants needed from the management to look at. We found a pattern from the answers that organizations are not dedicating enough time to learning over the working time in parallel. This group of workforce deal with maturity, quality, and different life priorities. For them, dedicating time to learning new digital skills overlaps mostly with personal time. They are in the senior stage of their career and have many assigned tasks that need high accountability at work. It is an obstacle to prioritizing learning over work pressure. Management needs to consider this and create well-being and flexible working atmosphere (Burchardt and Maisch, 2019) (Trenerry et al., 2021) (Vial, 2019).

They referred that companies expect people to learn without impacting their resilience in the delivery of their tasks. Work and organizational deliveries are directly related to performance measurement, so people prioritize working over upskilling new digital skills which they dedicate very limited time for. This is not a healthy environment to upskill the workforce and retain them as the greatest assets. They want management to find a framework to integrate digital skills learnings with work, an important factor for them is time, therefore implementation plans of upskilling programs need to be adjusted to fit with the working schedule as this group of employees sits with high-level work experience and commitment and want to keep the momentum and perform with quality.

Our literature stated that Organizations can learn collectively, and these learnings occur at various speeds and levels inside the firm; nonetheless, it is the employees within the company who learn (Turner and Pennington, 2015). Learning organizations attempt to develop values, policies, and procedures that make learning and working synonymous across the board. It is necessary to redefine roles and responsibilities as professional community members for co-learners. Furthermore, HR needs to help in developing measurements for the ambidexterity levels, thereby, assessing what can improve learning and working in parallel (Jackson and Dunn-Jensen, 2021).

Another point raised by some of the participants in the Covid-19 situation or the remote or hybrid mood of the working environment. They see it as a challenging condition by itself, and it leads to reducing their ability to focus on digital skills learning while they are working remotely in parallel. This is in line with (Dwivedi et al., 2020) paper that the remote environment after Covid-19 has resulted in a challenge.

Some of the participants also reflected, that age makes them somehow slower, and they cannot keep the same pace to focus on distraction as they use to do concerning the time they spend in their early careers. It became very important for organizations to investigate this area and evaluate how digital skills learning programs can fit the different groups of the workforce. Gates and Wilson-Menzfeld (2022), highlighted in their study a theme about “negative

perceptions of aging” to be considered for enhancing the learning experience of those audiences by understanding their learning style preferences.

Participants mentioned if they receive clear instructions on which digital skills to improve and receive help from super users in their units to support, they would be better able to learn and work in parallel. In the literature of this study, the work-life balance challenge is mentioned as an important matter for the senior workgroup. Upskilling is important for them, but time is hardly found at work due to a load of tasks and responsibilities. SME support was suggested to enhance their learning (Tikkanen et al., 2002), and this is also a similar approach proposed by the participants.

### **Customized Learning Programs**

As per the interviewees' view, there are too many dependencies on E-learning platforms which are good to a certain extent. But they lack hands-on training, live education, and interactive session. They feel that learning in a social context is an enabling factor for them to manage and ease learning new digital skills. Some of the answers indicated their thoughts of less ability to learn alone using E-Learning platforms than junior employees who are more used to this method. Also, they want to learn digital skills that match with needs, interests, and job roles. The covid-19 pandemic has influenced the learning environment, so employees found themselves in a need to enhance their use of digital learning platforms and learn digital skills at the same time. For them, this was not an easy experience, especially under the circumstances of remote working. Also, in parallel, they had to adapt quickly to more reliance on e-communication platforms such as Microsoft teams, and Skype, and learn better all their functionalities to support them in their daily tasks.

Learning format is being highlighted in the analysis; the participants need to have live classroom training to upgrade their digital skills. It is not enough to rely just on E-learning platforms but more on learning as a team. They have proposed that employees working in the same team combine work expertise to which they belong and digital skill expertise. They see it as a knowledge transfer model.

Supporting the above from our literature, the Covid-19 situation has impacted the learning environment and increased the spread of E-learning formats, which have advantages and disadvantages. They are yet in the title of improvement based on the preferences of the receiver. (Dwivedi et al., 2020). Also, Guido and Tamilla (2022), proposed a typology model that helps policymakers to enhance the delivery of digital skills learning. This model emphasizes that the learning format needs to align with the interest of the audience as they are the target group.

Buckler (1996), referred to, building a learning atmosphere requires assessing the current level of knowledge of employees and putting a high focus on their learning needs. Understanding the audience is essential when deploying the upskilling processes.

According to the World Economic Forum (2018), the workforce needs to be treated as capital assets and not as liabilities. All workforces should be in focus when it comes to capabilities enhancement rather than focusing on the potential high-skilled individuals, according to the IR 4.0 personnel strategy.

## 5.2 Concepts in relation to the Theoretical Framework

This research is based on the Organizational learning Theory of Argyris and Schön (1997) which uses the double loop learning method to identify the underlying cause of the problem. Single-loop learning occurs when errors are corrected without altering the underlying governing values (values, norms, and goals). However, Double-loop learning occurs when errors are corrected by changing the governing values and then the actions. To have effective double loop learning it's very important to define key questions that should be asked and if answered would make it possible to identify the cause of the problem. Learning of problems here is very important for the detection and correction of errors. Once the findings are made the information can be used by decision-makers to use to take corrective actions and see the effectiveness of having the correct feedback mechanism.

In our research we build our key questions in form of interview questions, we held several interviews with our participants to get the answers and analyzed the information received which are presented in form of 5 concepts 4 of them is defining the cause of the problem for research question 2.

Before identifying the challenges, which are causing the problem, it was also important to understand the mindset of the employees, to gain an understanding of their awareness and openness about the change which is the phenomenon we are studying. Thereby, RQ 1 did not purpose to identify the problems, that's why it's not applicable for double loop cause identification.

Concept no.	Causes	Doubel loop - Cause Identified
Concept 1	Embrace Digital Transformation	Not Applicable
Concept 2	Incentive and Recognition	Yes
Concept 3	Organizational Communication	Yes
Concept 4	Working and learning in parallel	Yes
Concept 5	Customized learning programs.	Yes

Table 3: Concept in relation to double loop method

Concepts 2,3,4,5 helped us in answering RQ 2 that are: the Lack of Incentive and Recognition, the Lack of Organizational Communication, Working and learning in Parallel, and the Lack of customized learning programs. Those are some of the key challenges that employees from the middle-age group face during the digital skills upskilling programs in the organization.

With their superior and rich work experience, this group is holding roles in organizations with high or several responsibilities and tasks, which demands a high level of commitment and accountability. When it comes to learning new digital skills during Digital transformation, they find it hard to prioritize between work and learning. They also don't have clarity on how these skills might change their current and future roles, and what level of expertise is expected from them due to a lack of clear organizational communication from management. Employees also find it difficult to compromise on their personal time as they have several commitments in life and interests. When it comes to finding the motivation to learn new skills, they feel the organization has a limitation in the statement of incentives. It's hard for them to visualize the end benefits that digital upskilling brings to their career either in a monetary or non-monetary

way. Because their performance assessment is dependent heavily on the work, which demotivates them to prioritize learning time over work.

Every significant action in the double-loop model is evaluated in terms of the degree it helps the research to generate valid and useful information including relevant feelings and solve the problem. The research has generated concepts through inquiry-based, fruitful dialogue with questions to validate underlying assumptions and beliefs that will enable us to change the governing variables, such as (values, norms, and goals) in the organization to solve these difficulties that employees encounter.

Based on these findings, we developed a framework that considers those challenges. It can be used by firms to improve organizational digital skills learning processes. The framework is presented and discussed in the following section.

### **5.3 Suggested Framework**

The building blocks of the proposed framework are derived from the interview's answers in the empirical analysis and literature review done in the previous section of the research. During the interviews, several participants highlighted the need for tailor-made programs and shared their observations on how organizations are assuming the current knowledge level of the employees, which they do not see it correct in their view.

Employees' current skillset, prior experience, and impact on the job from DT should be considered before creating any digital upskilling plan. Thereby, the challenges related to work pressure, lack of motivation to learn without any incentives, and career growth, are seen as major roadblocks in change management. Managers play a key role in enabling the prioritization of learning and balancing it with working time. Also, to create upskilling plans for the employees that can further support them during the digital upskilling learning programs. All these critical inputs came from the participants and have helped us to suggest this framework that can be used to address the challenges of the middle-aged workforce group in organizations throughout the digital upskilling programs in the digital transformation journey.

Organizations should set up a change management and digital enablement office which basically comprises a group of employees from different departments, SMEs from Human resources, and experts in the field of digital change management including senior and first-level managers. The group should discuss and define clear communication on organizational strategy define What is needed, why it's needed, and then investigate How it should be achieved. An organization should also define incentives for learning if it's not present.

Time reporting for the learning can be discussed and implemented in the ways of working within an organization, this can help us integrate learning and working into day-to-day life for an employee.

For employees in the middle-age group should be classified as one target group. Then, the employees' skillset, expertise, needs, and interests need to be assessed, then mapped with how DT will change their jobs and responsibilities.

Once target groups are defined, Organization should investigate new digital skillsets and learnings needed for the different target groups and define them respectively.

Once the digital skills and their level is defined next task is to define a customized learning program for the target groups to achieve the defined learning path. The learning path should be a combination of Web-based learning, Classroom learning, On Job, Workshops, and Support from subject matter experts.

Line managers should engage in discussion with employees to discuss the learning path and define expectations from them, they should also discuss incentives either monetary or career growth or certificates that relate to upskilling. The discussion should be done with an open mind where the challenges of the employee should be discussed and try to find support for him. Managers need to take a balanced approach to support employees in this transformation journey by creating room for a learning path in their day-to-day work.

The outcome of the discussion should be clearly defined, in a form of expectations, the support provided, and a learning path. It should be updated in the Employee Performance management system. The manager and employee should review this on regular basis to discuss challenges and progress.

At the end of the year, during employee performance management assessment, the manager should review the employee's digital skills learning progress, and provide constructive feedback, rewards, and recognize them based on the performance. Additionally, to make the necessary changes in the related roles and responsibilities. If there is any update needed in the learning path that should be followed, it needs to be reflected in next year's performance management plan.

Talent management needs to monitor the performance frameworks frequently to evaluate and validate the progress. furthermore, utilizing the documented inputs to supply the demand for internal vacancies to afford knowledge sharing, skills expansion promotion, opportunities, and job satisfaction for the employees.

## 6. Conclusion

### 6.1 Conclusion

This master's thesis aimed to get a deeper understanding of the experience of middle-aged employees working in the supply and finance unit that are going through DT. The research spots on investigating their mindsets, and the challenges they face during the digital skills upskilling programs that emerged through DT in the supply and finance roles. The master's thesis also aimed to propose a framework based on the result, that can be considered by firms when developing digital skills learning programs.

Supply and finance units were selected for this study because of the rapid and large influence of new technological changes, DT is seen to create great benefits in those domains. Many of the mundane tasks happening manually today such as financial forecasting, supply chain management planning, reporting, analysis, visualization, etc, would be done by robotics and neural algorithms. This would reduce the lead time for handling the firm's operation and provide more accuracy in predicting the outlook of businesses, it would also solve the massive growth in data and solve the problems of security and accesses rights. As an outcome of that, current roles are being evolved, and digital skills are demanded to be core for the employees working in supply and finance units. (Koch, 2021) (Lim et al., 2020) (Lu, 2021) (Yanamandra, 2019).

As consequence, the upskilling of the workforce is going to play a major role in the successful adoption of digital skills to meet the company's future digital vision because employees are the core of any transformation within organizations, in DT (Burchardt and Maisch, 2019) (Jackson and Dunn-Jensen, 2021).

Thereby, managements are launching digital skills learning programs to support the employees in leveraging technology with their work and enhancing their digital competencies to run at a fair speed and adapt to the ongoing changes. Middle-aged employees form a major part of the workforce and will continue to have a major contribution to the labour market in the future. With the rapid change in technology, studies referred that the middle-aged workforce has higher gaps in digital skills versus the younger (Martin, 2018), (Tams, Grover and Thatcher, 2014). Onboarding this group digitally is vital, to keep their rich knowledge and valuable working expertise, for a more professional handling of the company's business.

From the above-mentioned purposes, two research questions arose: **RQ1:** What is the employee mindset during the digital transformation journey within the organization? **RQ2:** What are the challenges that employees from the middle-aged groups experience during the digital skills upskilling programs?

For this, we have conducted an interpretive qualitative study, The data was collected through semi-structured interviews with participants from the supply and finance units working in ICT companies, who belong to middle- age workforce group. Lichtman 3C thematic analysis (Lichtman,2014) was used to analyze the results, five concepts were generated. Those concepts represent the findings of the master's thesis research and were interpreted and discussed with the help of the theoretical framework of Organizational learning Theory (Argyris and Schön, 1997).

We concluded with the answers to the research questions and a discussion of the findings, the answer for **RQ1** is this group of employees has a positive mindset about DT and can embrace it, they are aware of the potential benefits and the correlating changes. But they also experience challenges when they are requested by management to upskill their digital skills under the terms of DT umbrella. The answer for **RQ2** is that the challenges are:

- Incentive and Recognition.
- Organizational Communication.
- Working and Learning in parallel.
- Customized Learning Programs.

The experience of this group would be improved by developing digital skills learning frameworks that factor in the addressed challenges. People management needs to boost the motivation for this group to learn through several forms of incentives. Objectives, paths, and practicing opportunities need to be clearly communicated, and a two-way communication channel between management and employees has to exist to allow a feedback loop. Clear instructions and measurements need to be available for allowing time to integrate as part of working hours. Finally, offering learning formats that suites the needed style, skill levels of audiences, and their interests based on the chosen path rather than generalization considering a regular measurement for the progress of skills development.

Based on the above, our study proposes a framework (section 5.3) that firms may consider when developing digital skills learning initiatives.

## **6.2 Contribution of the study**

This interpretive study contributes to the field of information systems as it discusses the employee's reaction to the DT phenomenon, and how they respond to the initiatives of upskilling of digital skills evolved from the raise of interaction with advanced technological systems and tools (Walsham, 2006). Also, it provides a description and analysis of the phenomenon without any predictions. The theoretical and practical contribution of the master's thesis research is descriptive and explanatory (Gregor, 2006).

The practical contribution of this master's thesis study is to help the Supply, Finance organizations, and human resources, to improve the digital skills upskilling programs and frameworks, to enhance the employees' experiences, and provide positive experiments during the DT journey, particularly toward the middle age group of the workforce. It also contributes to the field of organizational learning by explaining the mindsets and challenges faced by middle-aged employees when they need to expand their digital skills and technological knowledge emerging from the DT of the organization. which would help decision makers to take corrective actions and create effective change management strategies to gain the desired benefits of DT. The framework developed in this study based on the outcome of the analysis can be used by firms to improve their digital skills learning initiatives.

This study can be also helpful in areas outside the supply and finance units, and in different countries. The research can also be used in studying the areas related to upskilling digital skills for workforce aging.

### **6.3 Future Research**

This conducted research focused on the Swedish workforce from the middle-aged group, who are working in Supply and Finance units within ICT companies. A limitation of this research is that ICT companies' workforces are likely to be influenced by IT in the overall organization. They are more exposed to technology than other companies' workforce. Future research suggests studying the same scope of the workforce in non-ICT companies or in areas outside of Supply and Finance units.

Similar research may be conducted outside Sweden in other European countries could also be of advantage for organizational learning and to improve the future of aging workforce challenges.

This research could be also duplicated on a different age group as it is valuable to get their opinions also about the challenges during digital upskilling programs.

This research is a qualitative design method using semi-structured interviews. Future research could be done using a quantitative design study through surveys to cover a scope of a wider range of the workforce to richness the data about the challenges.

### **6.4 Reflections**

This research allowed us to learn more about a topic that is both fascinating and beneficial to the organization. This master's thesis broadened our horizons and deepened our understanding of digital transformation and its role in the Supply and Finance departments. It helped us unfold the complexities and challenges that workforces face during upskilling of digital skills, and the role of companies in handling that. We spent a lot of time working on the literature study and trying to cover and connect different areas of digital transformation, such as supply, finance, people concern, demographic viewpoint, workforce aging challenges, different digital technologies and skillsets, and their roles.

As part of an academic project, we were concerned about collecting empirical data and obtaining all necessary approvals and consent. We were also concerned about interviewing participants and their reactions, but they responded nicely and were pleased that we were addressing such an important topic with them. We often worked with numbers in our professions, but this time we had to work with text. There are various text analysis approaches accessible, but we felt that 3C Lichtman's thematic analysis was more relevant to our situation and provided us with the tools we needed to handle and analyze the material. The results of the analysis were interesting and justified the purpose of our research in this area.

We have both contributed to this thesis, and we have aligned the distribution of the responsibilities based on our individual skills, academic knowledge, and time. Overall, both of us have contributed to all chapters.



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## 8. Appendices

### Appendix 1 : Literature review table

Year	Authors	Topic	Database
2019	Burchardt and Maisch	Digitalization needs a cultural change – examples of applying Agility and Open Innovation to drive the digital transformation.	Scopus
2019	Mergel, Edelmann and Haug	Defining digital transformation: Results from expert interviews.	Scopus
2019	Vial	Understanding digital transformation: A review and a research agenda.	Scopus
2018	Schwarz Müller	How Does the Digital Transformation Affect Organizations? Key Themes of Change in Work Design and Leadership	Scopus
2021	Jackson and Dunn-Jensen	Leadership succession planning for today's digital transformation economy: Key factors to build for competency and innovation	Scopus
2019	Fenech, Baguant and Ivanov	The Changing Role of Human Resource Management in an Era of Digital Transformation.	Scopus
2020	Dwivedi	Impact of COVID-19 pandemic on information management research and practice: Transforming education, work and life	Scopus
2021	Koch	Your 5-Year Upskilling Plan. Strategic Finance	ebsohost
2021	Gullers and Gref	Interim CFO as the leading change agent in a digital transformation of the finance function: A qualitative multiple case study approach	Diva/ Linnaeus University
2019	Yanamandra	A Framework of Supply Chain Strategies to achieve competitive advantage in Digital era	IEEE Xplore
2007	Thun, Größler and Miczka	The impact of the demographic transition on manufacturing	Emerald
2018	Ghobakhloo	The future of manufacturing industry: a strategic roadmap toward Industry 4.0	Emerald
2014	Tams, Grover and Thatcher	Modern information technology in an old workforce: Toward a strategic research agenda	ScienceDirect
2012	W Stedmon	Ergonomics/Human factors needs of an ageing workforce in the manufacturing sector. Health promotion perspectives	Researchgate
2002	Tikkanen	Working life changes and training of older workers	Academia
2015	Turner and Pennington	Organizational networks and the process of corporate entrepreneurship:  how the motivation, opportunity, and ability to act affect firm knowledge, learning, and innovation	Springer
1996	Buckler	A learning process model to achieve continuous improvement and innovation	Emerald
2022	Guido and Tamilla	Upskilling and Reskilling for the Future of Work: A Typology of Digital Skills Initiatives	isedj
2022	Gates and Wilson-Menzfeld	What Role Does Geragogy Play in the Delivery of Digital Skills Programs for Middle and Older Age Adults? A Systematic Narrative Review	Google scholar
2020	Lim et al.	Workforce Resilience: Integrative Review for Human Resource Development.	Google scholar
2021	Lu	Big data and supply chain digital transformation	IEEE Xplore
2019	Mgiba	Upskilling, and Reskilling of the Sales-Marketing Personnel in the Fourth Industrial Revolution Environmen	IEEE Xplore
2021	Wahab, Rajendran and Yeap	Upskilling and reskilling requirement in logistics and supply chain industry for the fourth industrial revolution	Google scholar
2021	Trenerry et al.	Preparing Workplaces for Digital Transformation: An Integrative Review and Framework of Multi-Level Factors	Google scholar
2018	Martin	Live Longer, Work Longer: The Changing Nature of the Labour Market for Older Workers in OECD Countries	Google scholar
2010	Boulton-Lewis	Education and Learning for the Elderly: Why, How, What. Educational Gerontology	Google scholar
2006	Boulton-Lewis, Buys and Lovie-Kitchin	Learning and Active Aging	Google scholar
2018	Arbogast, Cummins and McGrew	Older Workers and digitalization : Opportunities and challenges for life long learning	Google scholar
2018	World Economic Forum	The Future of Jobs Report 2018	Google scholar
2022	Deloitte	Finance Digital Transformation: Predictions for 2025	www2.deloitte.com

## **Appendix 2: Interview Guide**

### **Introduction:**

This study is a part of a master's thesis in information systems at Linnaeus University. The purpose of this master's thesis research is to understand the mindset, that employees from the middle-aged groups working in the supply and finance units experience during DT. In addition, this master's thesis explores the challenges this group face during the digital skills upskilling programs, as a consequence of DT where new demands and changes emerge, given the increasing involvement of advanced technology.

The purpose of this interview is to gather your opinions and suggestions, as a subject matter expert meeting the research criteria. We have identified the key questions that may provide sufficient answers for the study, and the purpose of my interview is to receive input. This interview is being recorded if accepted, or notes will be taken in a word document for analysis purposes to capture and understand your opinion, however, be assured that the recording and your identity will remain confidential. All collected information will only be used to create an analysis of the mentioned topic and remain anonymous, with no identifying information associated with the data. Companies and individual identifiers will not be published in any manner.

### **Questions:**

#### **Background/Demographic:**

1. How many years you have worked in the Finance / Supply function?
2. Which year did you change your previous role in this sector?

#### **IT Transformations experience:**

3. How many IT transformations you have seen within the company in your career?

#### **Need for Digital transformation:**

4. Do you see the need for Digital Transformation within the Supply/ Finance function?

#### **Digital skills:**

5. What different digital skills you have read or heard about like AI, Bigdata, etc.?
6. Where did you learn about it?
7. What are some of the problems do you think can be solved with digital skills during transformation in Supply / Finance?

#### **Challenges:**

8. Do you see challenges when it comes to learning new digital skills and what are they?
9. Do you see challenges on a personal level (like commitment on time and efforts, family level, etc.)?

#### **Driving successful digital Upskilling:**

10. What will be the top 3 things that you see your company should keep in mind or address while driving digital upskilling during Digital transformation in the Supply / Finance function, to be successful?

**Focused digital upskilling Programs for workers based on age:**

11. Do you think we need to have a segmented approach for the digital upskilling process for people in different age groups to be more focused and adapted to their learning needs?

**The future of the number of jobs in the Supply Finance unit:**

12. Do you think automation and digitalization will lead to a reduction in jobs within Supply and finance units?

**Motivation and enabling factors:**

13. What could increase the motivation of learning new digital skills at work?
14. Do you think E-learning platforms and programs deliver the purpose of learning digital skills?
15. Which are the enabling factors for working and learning new digital skills in parallel, and drive innovation?



## **Appendix 3: Informed Consent Form**

### **TITLE OF STUDY**

Upskilling of Digital skills during Digital Transformation - *A qualitative study about Mindset & Challenges of middle-aged group employees in supply and finance units.*

### **RESEARCHERS**

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Students of Master Program in Information Systems, Linnaeus University.

### **PURPOSE OF STUDY**

The purpose of this master's thesis research is to understand the mindset, that employees from the middle-aged groups working in the supply and finance units experience during DT. In addition, this master's thesis explores the challenges this group face during the digital skills upskilling programs, as a consequence of DT where new demands and changes emerge, given the increasing involvement of advanced technology.

### **STUDY PROCEDURES**

For the research, it is mandatory to conduct oral interviews, however considering the Covid-19 situation and hybrid working environment, some interviews can be conducted via video calls based on the interviewee's preference. After collecting the interview text, data analysis and the conclusions will be the next step to completing the study.

Each interview is expected to be 30-minute-long, and the duration of the full study is 3 months.

### **RISKS**

This study does not include information that could pose a risk for any of the participants. All data gathered from the participants will be strictly and solely to perform this research and will not be given or published anywhere other than for this research work. In addition, participants during the recording or noting process of the interview no names will be mentioned to protect their intellectual property rights.

You may decline to answer any or all questions and you may terminate your involvement at any time if you choose.

### **BENEFITS**

This study may enable Supply and Finance units of ICT companies in Sweden to develop successful strategies for digital skills upskilling during digital transformation considering the diversity of age groups and initiate and take a decision to design new or improve the existing digital upskilling frameworks based on the result. A copy of the final report will be given to all the participants to see the analysis and conclusion.

### **CONFIDENTIALITY**

For this research study, your comments will be mentioned research without mentioning your name or organization. Every effort will be made by the researcher to preserve your confidentiality including the following:

- Assigning code names for participants that will be used on all research notes and documents.

- Keeping notes, interview transcriptions, and any other identifying participant information in a locked file cabinet in the personal possession of the researcher. Participant data will be kept confidential.
- All data captured will be handled based on the GDPR.

#### CONTACT INFORMATION

If you have questions at any time about this study, or you experience adverse effects as a result of participating in this study, you may contact the researcher whose contact information is provided.

#### VOLUNTARY PARTICIPATION

Your participation in this study is voluntary. It is up to you to decide whether to take part in this study. If you decide to take part in this study, you will be asked to sign a consent form. After you sign the consent form, you are still free to withdraw at any time and without giving a reason. Withdrawing from this study will not affect the relationship you have, if any, with the researcher. If you withdraw from the study before data collection is completed, your data will be returned to you or destroyed.

#### CONSENT

I have read and understood the provided information and have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without cost. I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

Participant's signature \_\_\_\_\_ Date \_\_\_\_\_  
Researcher's signature \_\_\_\_\_ Date \_\_\_\_\_

## Appendix 4: Codes, Categories and Concepts

Codes – 75	Categories – 18	Concepts - 5
<p>Several years of experience, Open for changes , Lived and Survived several transformations , Need Digital Transformation , Digitalization Increase Efficiency , Improve operations , Reduce manual task , AIML , Data Science and analysis , Power BI and Visualization , Cloud Technologies , During Work , Read in Social media , Internet Videos , Saw in Presentations , Complex Supply chain issue , Planning and Forecasting , Increase Predictability , Reduce Human error , Reduce manual calculation , Increase accuracy</p>	<ul style="list-style-type: none"> <li>· Open to Change</li> </ul>	<ul style="list-style-type: none"> <li>· Embracing Digital Transformation</li> </ul>
	<ul style="list-style-type: none"> <li>· Willing to contribute</li> </ul>	
	<ul style="list-style-type: none"> <li>· Aware of Digital Skills</li> </ul>	
<p>Not enough trainings , varied Trainings speed based on Age groups, Training program based on Skillset and Prior experience , Create different learning methods , Understand audience before creating learning method , Match people expectation in courses , Learning plan based on Job role people involved in , Learning Platform Helps to some extent , Depends on Audience skillset , Help Partially , Classroom trainings are Important , Mixed learning Methods , Lack of Possibility to ask question in Webcourses , More Interactive classes needed , Use Hybrid learning methods</p>	<ul style="list-style-type: none"> <li>· Learning program based on Skillset and Experience</li> </ul>	<ul style="list-style-type: none"> <li>· Lack of Customised Upskilling Programs</li> </ul>
	<ul style="list-style-type: none"> <li>· Varied Pace learning program</li> </ul>	
	<ul style="list-style-type: none"> <li>· Hybrid Learning model (Web+classroom+On Job)</li> </ul>	
<p>No time to Learn due to workload , Get Slow with aging , Time Management , Work life Balance , Family time vs Learning time , Allocation of Time , Prioritize Learning over Work , Manager to allocate Learning time , Learning should be made equally Important , Promote Learning weeks , Reduce Work load</p>	<ul style="list-style-type: none"> <li>· Prioritisation between Working and Learning</li> </ul>	<ul style="list-style-type: none"> <li>· Working and Learning in Parallel</li> </ul>
	<ul style="list-style-type: none"> <li>· Performance pressure</li> </ul>	
	<ul style="list-style-type: none"> <li>· High commitment to Family time</li> </ul>	
	<ul style="list-style-type: none"> <li>· Aging factor</li> </ul>	
	<ul style="list-style-type: none"> <li>· Job Security</li> </ul>	
<p>Willingness to learn and Change, No motivation, Life Priorities, Create Incentive for Upskilling , Promotion, Increased Salary, Flexibility at work , Offer Diploma courses on upskilling program , Increase Knowledge , Map Learning with Performance goal , Reward and Recognition</p>	<ul style="list-style-type: none"> <li>· Incentives for Learning</li> </ul>	<ul style="list-style-type: none"> <li>· Lack of Incentives and Recognition</li> </ul>
	<ul style="list-style-type: none"> <li>· Monetary benefits</li> </ul>	
	<ul style="list-style-type: none"> <li>· career growth</li> </ul>	
<p>Lack of Change Management, Organization willingness to Invest in People , Ambiguity in Career path ,</p>	<ul style="list-style-type: none"> <li>· Lack of Communication</li> </ul>	<ul style="list-style-type: none"> <li>· Lack of Organizational communication (continune to next page..)</li> </ul>
	<ul style="list-style-type: none"> <li>· Purpose and Vision not clear</li> </ul>	

No Push from Organization , Lack of Clarity from Management , Purpose not defined by company , Implement Change where Needed , Clear Communication , Why What and How , Employee engagement at early stage , Invest on People and Training , Automation will reduce Job , Digitalization will change Job type , Digitalization will not reduce Job it will evolve Job roles , Certain roles will be obsolete	· Concern of Automation will reduce Jobs	
	· Missing change management	

## Appendix 5: Text to codes

Question 1	
Interview Text	Code
19 years	Several years in Supply & Finance
10 years	
11 years	
12 years	
14 years	
15 years	
17 years	
18 years	
25 years	
30 years	
36 years	
37 Years	
25 years	
30 years	
40 years	
Question 2	
Interview Text	Code
2012 changed role	Open for changes
2018 moved in new role	
2020	
2021	
2022	
15 years was an engineer before that.	
20 years in finance	
5 years, but was in another finance role	
Always working in finance	

last year, new finance role but I was in finance	
several roles in finance	

Question 3	
Interview Text	Code
3	Lived and survived several transformations
4	
7	
10 IT transformations	
12 transformations in IT such as changing to SAP, new systems, agile work, SOX	
13 IT transformations	
3 main transformations	
4 major, especially when performing period end closing in the past using old tools and then having different systems such as scala, i scala until SAP today.	
more then 10	
Several transformation, for example major IT one when getting an IBM PC, then seving the data from PCs to servers, then having internet,,etc	

Question 4	
Interview Text	Codes
Absolutely. We are implementing a lot of good things but perhaps we are not so well coordinated, and a lot of things developed are not deployed in a wide scale.	Need Digital Transformation, Digitalization Increase Efficiency , Improve operations , Reduce manual task
Definitely. Digitalization is fundamental for any company to simplify the daily operations but also to increase the resource efficiency.	
Needed	
yes	
yes, becasue data will be more accurate and better visualized, enable seeing the big picture with data growth, ease of monitoring changes, reduce manual work.	
yes, due to growth of data that needs analysis for professional conclusions, reduce manual tasks, and connect data from different sources.	

yes, it simplifies the work, but contribution is still limited from my end	
yes, simplification and automation for better quality work	
Yes, there still to many things done manually.	
yes, to remove the manual shuffling of reports and analysis, also to reduce the number of xl files being used today. B22	

Question 5	
Interview Text	Codes
AI, Automation, Big data	AIML, Data Science and analysis, Power BI and Visualization, Cloud Technologies , Data warehousing
AI, Big data, power BI, SAP HANA, ERP, share points , one drive, Microsoft teams, google meet. Apps such as Bank ID which is hard to survive without in Sweden.	
AI, data warehousing, OLAP, CUBE.	
AI, Machine learning, Big Data	
AI, ML, Big data, automated reports, etc	
AI, ML, Data Lake	
AI, power BI, SAP	
All and, cloud technique	
data analytics, AI, Automation	
Data Analytics, Data aggregation, Big Data, digital literacy, Artificial Intelligence, data modelling, dashboard creation,	
Data Modelling, Design & Software Engineering	
Every day there are new things, AI, ML, Power BI	
Not many though. Can't really connect any skills that I have read or heard about	
social media, google, Omni-channel, automation power BI, tableau, sales analytics, etc.	
Tableau, Qlik sense	

Question 6	
Interview Text	Codes
At work, training sessions, people, knowledge sharing reading newspaper and media to keep track on what is happening, curiosity.	During Work, Read in Social media, Internet Videos , Saw in Presentations
degreed, percipio, Skillsoft, Brilliant, intranet	
Internet and in my work	
internet, lectures, books, social media	
Linked in, Udemy.	
Mainly thru work	
mostly at work	
NA	
On job & Online Courses	
Through work, through presentations	
Within my job role	
work	
work, reading newspaper, commercial, and in social media.	

Work.
-------

Question 7	
Interview Text	Code
Better forecasting, better planning with reduced scrap, reduced tied-up capital in in- and out-bound buffers, overall better resilience in our supply chains, less stress in the organization, more time for employees to work on improvements and innovations.	Complex Supply chain issue, Planning and Forecasting, Increase Predictability , Reduce Human error , Reduce manual calculation , Increase accuracy
Data based decision making, preventive maintenance, accurate stocktaking, predictable supply chains, enhanced collaboration, automation, lack of sufficiently skilled workers	
Data processing, Data analysis, Complex Supply chain issues.	
data quality, better data translation, forecasting, solving complex problems by algorithms.	
Easier, quicker and real-time access of information. Reduce manual work. Better tool for analytic works etc.	
Human errors, managing data complexity	
increase forecast accuracy, reduce analytics activities performed by a person	
Keep track on data and easy extraction, get a clearer data understanding and the ability to combine different data set from different fields together. Ability ti do smart analysis. Cross analysis of different sectors. Maintain access rights and confidentiality of data.	
More efficient analysis, planning and execution	
Production plan that is on excel or anything follow ups that are currently on excel format. Excel formats are locally stored and needs to send or upload which is inefficient.	
Removing the routine work, if implemented correctly it will reduce the human errors, efficiency, add more valuable work.	
Speed, reduce manual work, reconciliation, forecasting, the system needs to work for us not the opposite	
Supply Lead Times Material Scraping Excess Procurement Product Forecast Material Planning Issues Customer orders processing	
Training, enabling the big picture understanding, fixing master data, increasing the competences to enter the data.	
Transparency so more people could have access to needed data. Efficiency, if we can make certain data available in reports or dashboards. More fact based decisions.	

Question 8	
Interview Text	Codes

Change management could be one obstacle. Then it's also a question of the will to invest on the resources so they have the opportunity to learn.	
doubt in people whether this is the correct path, difficulties adapting to a new transformation and learning new skills,	
I do not see any problem but believe high portion of education is needed for employee to increase digital skills and embrace new technology to get maximum output of new.	
It's very limited we don't really see a push for learning digital skills	
Need for a clear message from management about what to learn. Receiving clearer guidelines. Getting support from professional consultants that answers learners' questions.	
No challenge	
One challenge is to see the tree in the forest. A lot of learnings are launched but to know I need for my job role is not easy. Another challenge is to find time to learn. As it is up to the individual to be responsible for his/her learning it might get down prioritized due to urgent issues coming from management or other important stakeholders. Some of the basic learning should perhaps be mandatory to the whole organization or company.	Lack of Change Management, Organization willingness to Invest in People, Ambiguity in Career path, No Push from Organization , Lack of Clarity from Management , No time to Learn due to workload , Purpose not defined by company , Not enough trainings , Willingness to learn and Change , No motivation
Think this needs to be organized in some kind of training programs in order to set enough time for it.	
yes, complexity, usage of the tool, understanding the purpose.	
yes, its complex, lack of identified trainings, lack on individual hands on, we need training by doing. Its so much changing.	
yes, its vastly changing and risk of being outdated quickly, time, level of complexity, ways to handle.	
Yes, it's not enough to learn but also t understands how these skills will be used for all work, lack of training support, lack of guidelines, lack of learning by doing concept.	
yes, its quickly changing that continuously we here about new initiatives. Different opinions, no clear message on what to focus on	
Yes, there are few challenges: - Higher age group employees' willingness to upgrade to new skill sets - Digital dashboards not being used - Proper Trainings focusing on learning new skills - Time allocated by company on learnings	
Yes. Finding the time learn is always hard to find and there almost always resistance to change	



Question 9	
Interview Text	Codes
Age, keeping up learning all time, younger people have fresh competence priority challenge, interest. Also, the older feeling less experienced in fresh technology. Richness of working experience but warned out to change. Not afraid to change but too many happening overtime.	Get Slow with aging, Time Management, Work life Balance, Family time vs Learning time , Not enough Motivation , Life Priorities
age, the older the slower to learn, time.	
I think as the previous answer that the first step must be that management level are willing to invest on the resources, in which its free up time for the resources to learn new skills. Then what is remained as crucial is the personal interest.	
If organized in training programs with support from management, there should be ways to find time for it.	
Mostly I would say it is a time issue. If we you target to fulfil that is the basis for your judgement about work performance, it is easier to prioritize those before increasing your knowledge.	
Nothing to be highlighted.	
share time between family, work, study	
Taking out time from regular activates/family engagements for upgrading skills	
time - predefined learning schedules for ease of time management in prioritizing learning	
Time commitment	
Time to learn, prioritization but I am interested and curious to learn.	
time, I need more knowledge sharing from co-workers.	
Time, interest, ability to grasp the change, being slow with age, different life priorities, hesitation by getting older.	
yes, age as skills go slower, different priorities, moving to different life values.	
Yes, During WFH scenario its hard to concentrate on learning.	

Question 10	
Interview Text	Codes
1 Implement where needed. Not everywhere just because 2 Start small and evolve it 3 Get feedback from those affected	Implement Change where Needed, Clear Communication , Why What

<p>1) Change journey and communication about what we are doing in this area. We get some newsletter from time to time but live presentations are better. Clear purpose of what problem we are solving.</p> <p>2) Deployment takes time and need allocation of time. Many good initiatives never flies because we miss the deployment part.</p> <p>3) Change agents or ambassadors in the organization. People who can hands on help the different units to start using the data available.</p>	<p>and How , Allocation of Time , Employee engagement at early stage , Create Incentive for Upskilling , Prioritise Learning over Work , Invest on People and Training</p>
<p>1. Transform in a stepwise approach to let everyone to adapt to it. 2. Making sure that the transformation really gives benefits to the company. 3. Communicate the vision of our journey. What is our purpose, why are we doing this.</p>	
<p>Appoint subject matter experts in each unit. More communication and sharing of successful stories. Clear guidelines about the purpose and direction rather leaving it to personnel, free up time.</p>	
<p>automation, machine learning, data analytics</p>	
<p>Clear communication about the purpose, opportunity to practice the learnings, training</p>	
<p>communicate the benefit based on audience knowledge level, involve the user and stakeholder as early as possible, factor for learning curve, create incentives for knowledge gain, motivate and reward pioneers</p>	
<p>Communicate the clear vision, not to ask many things and trainings at the same time dedicate special groups to drive it.</p>	
<p>communication on Purpose, Progress, On-boarding</p>	
<p>Empty time for employees to learn, availability of superusers, trainings.</p>	
<p>Explaining the reason, transparency on messages, provide a value and not just to add a task. There is a need to express the purpose, introduction on why, there are alot of talks but lack of facts.</p>	
<p>Focus on problem statement Arrange proper trainings Dedicated budget and time for learning</p>	
<p>Improve learning programs, communicate clearly, take decision on what employees should focus on because addressing high level message about learnings may reduce motivation.</p>	
<p>Profitability, Customer centric approach, Market leadership</p>	
<p>Strategy, people and culture, Customer experience</p>	

Question 11	
Interview Text	Code
No	varied Trainings speed based on Age groups, Training program based on Skillset and Prior experience, Create different learning methods, Understand audience before creating learning method , Match people expectation in courses , Learning plan based on Job role people involved in
no, because it's not about age but it's about interest but also good to have measurements.	
no, but its connected with interests as it is different between personnel, trainings could improve and be designed differently.	
No, its not the age but based on experience and interest.	
No, not based on age rather based on existing skills. Some people are more advanced than others so having some classification such as Basic, Medium, Advanced would help to put the upskilling at the right level for the audience.	
not really but rather the interest, it is important to understand the audience and match it with their requirements and interests. This group need to interact with people to train them what to do and be supported with subject matters experts.	
Simply, Yes.	
Yes	
Yes that could be a factor to look into. But also, other segmentation could be relevant like, previous experience in other organizations like Design etc.	
yes, between recently graduated and senior people due to experience, people can segment themselves.	
yes, by the age you get more chances to perform different roles and skills while young people have a fresh experience.	
Yes, depends on capabilities to learn & implement there should be segmented approach.	
Yes, I believe that this would be a good approach. But at the same time, I believe many people need upskilling in this area.	

Question 12	
Interview Text	Codes
It will affect the amount of work in different job roles and people may need to move around in the organization, but more time can be spent on improvements and innovations and work-loads can better be even out. But whenever there is an efficiency gain proved over a year or two there will of course always be unsentimental forces within a company to do more with less.	Automation will reduce Job, Digitalization will change Job type , Digitalization will not reduce Job it will evolve Job roles , Certain roles will be obsolete

Many people tend to say no and explains like the digitalization will not reduce jobs but instead only changing the way your work. I don't believe that. With digitalization I believe we can have automated processes which results to some jobs will be obsolete.

No

no - job profile will change

No, the more details are given the more request, there is a risk to increase the workload.

No, it's not a reduction of jobs but roles will change

Not immediately but long term I think it will and should, otherwise this is a very costly initiative without payback.

Not necessarily, but this will absolutely reduce allot of the manual work done today.

not necessary, transactional work may disappear but new roles and tasks will come

Not really. It will help to get the work done efficiently and with minimum errors so that people can be more productive and can have more time for innovations.

yes

<b>Question 13</b>	
<b>Interview Text</b>	<b>Code</b>
All of the above, at the same time I believe this is the future so not sure special motivations are needed but important to enable time for digital upskill	Promotion, Increased Salary, Flexibility at work, Offer Diploma courses on upskilling program, Increase Knowledge , Map Learning with Performance goal , Reward and Recognition
Curiosity, Learning new things, job satisfaction, promotion and career growth. It gives a positive feeling	
Feedback, not only the salary you need to enjoy what you are doing, job satisfaction, having an open-minded teams and discussion	
If provided by goals and all improvements that comes with digitalization that is a motivation for many. Working always has meant to learn new things, that is the fun part of it. An Diploma could work well to certify training programs gone through.	
incentives, rewards, salary, games for most courses done or something	
increase in salary	
Increasing knowledge and efficiency at work resulted from using the digital skills	
Perhaps not motivating but put-up targets for learning and make them equally important to your performance as other goals you have today in our performance tracking tool	
Pointing the benefit and highlighting the value recognition, promotions that could be associated with incentives.	
Promotion, Salary increase, recognition	
Realization of necessity of learning play vital role and Reward & recognitions can serve the purpose very well.	
Salary increase or bonuses	
The motivation could be that Digitalization is inevitable. You need to adapt and learn the new skills compared to how you have learnt to use a smartphone. Then of course we can use a job stage increase or title change which should reflect that you have learnt those skills. Some kind of an awarding.	
The outcome from simplicity and knowledge increase. Motivation is individual, for my it's not important for my CV but I want to learn to gain more educational insights about digital tools.	
the reduction of routine work, it is an individual thing because there is no framework that can fit all, opportunities, clearer direction on the tangible outcome.	

Question 14	
Interview Text	Codes
60% , but still guidelines are needed on which content and courses to choose from	Learning Platform Helps to some extent, Depends on Audience skillset, Help Partially, Classroom trainings are Important , Mixed learning Methods , Lack of Possibility to ask question in Web courses , More Interactive classes needed
80% is good, employee response maybe different	
Depends on the aging group, for younger generation yes but for older generations no	
I do not think they have the same effect as targeted learning.	
Sometimes, there are improving and becoming more interactive.	
This should be complemented with classroom training as well if the upskilling needed is big.	
To some extent but not always. Interactive training where you have the possibility to ask questions should be a complement to some of the trainings.	
To some extent. In my opinion classroom trainings are more efficient.	
To some extents, yes.	
Yes	
Yes, but we need a super user to help when we are practising	
yes, if you know which course to take, content is good	
yes, they are good but it's hard to know which one to choose, also the lack of practise.	

Question 15	
Interview Text	Codes
A training program over time to allow ordinary job in parallel with training.	Manager to allocate Learning time, Learning should be made equally Important, Use Hybrid learning methods , Promote Learning weeks , Reduce Work load
As indicated earlier, make some of the learning mandatory which means that you need to allocate time for it. As a manager you can put learning assignments on an individual, but it depends very much on the manager then. I think it would be easier if Supply as an organization decided to go for certain courses.	
Curiosity, challenging tasks, saving money for company.	

good time management from individual, factoring learning into job assignment by manager
hybrid models to support different groups
Important to show how the learning can be beneficial/ help you to become more efficient in current work.
Interest, knowledge development.
It is good when there is a team of employees with mix high skills work experience and high skills digital experience.
Knowing its mandatory, learning in social context and as a team, company initiatives, promotions.
Learning sessions in office or a learning week
Prioritization of learning over work
The requested learnings need to be integrated to work and we need to be able to practise when doing the job.
Time allocation by manager and support from management
time, the advantage on learning different ways of doing the work, prioritization, feedback.
Working environment & Resources

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