From the employee perception view towards the digital transformation
Abstract

**Background:** Digitalization is the latest trend in the world. Companies are driving the process of digital transformation in order to meet the digital age. Many factors influence digital transformation, of which a review of previous research has identified digital technology and digital leadership as two important factors in digital transformation.

**Purpose:** The purpose of this thesis is to understand the impact of resisting the digital transformation of enterprises from the perceived dimensions of their employees.

**Method:** A deductive and quantitative approach was adopted. The online survey is the channel to collect primary data. The empirical data are sorted and analyzed by Excel and SPSS. To ensure the accuracy of the data, 253 raw data were sampled and finally collated into 173 data for further analysis.

**Conclusion:** Summarizes the findings of our article, which explores the factors influencing employees' attitudes towards resistance to digital transformation. The results found that employees' attitudes towards digital tools and digital transformation were positively correlated. The findings of this article have some limitations and are described in terms of the research methodology, the findings of the study. It also suggests areas for future research.
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Kaiyan Deng
Yaning Mo
Yue Yang
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1. Introduction

1.1 Background

Digitalization is growing faster than any innovation in our history in just 20 years. Not only developed countries have benefited from digitalization. Meanwhile, about 50% of the population in developing countries has benefited from digitalization and has transformed their societies (United Nations, 2022). The concept of digitalization is one of the most common themes nowadays. The technologies associated with this concept will be amplified by each other as they develop. Therefore, the rise of digital technologies has led to various changes in the way people work and live. Digital technologies have brought changes in all fields of activity. With the rise of digital platforms, it is no longer necessary to be physically present at work; instead, the network and the Internet may serve as a workplace.

The outbreak of the covid-19 pandemic in recent years, multiple national and local lockdowns, social isolation measures, government-led border closures, and a host of other measures have forced many enterprises to adapt their business models in a short period of time, or worse, fundamentally change the way they operate. As a result, more enterprises have chosen to digitally transform in order to ensure that their business is not affected by the pandemic, which has accelerated the digitalization of enterprises (Amankwah-Amoah et al., 2021). Moreover, enterprises undergoing digital transformation can help them improve efficiency and productivity, better manage resources, improve customer engagement and increase corporate revenue, bring in new markets, etc. (Mary, 2021).

The three regions at the forefront of digital development throughout the world are the Americas, Europe, and Asia. For the Americas, digital development is faster mainly because of its five advantages: technology leaders, innovative, tolerant culture, technology agnostic, market-driven, and speed. These aspects help enterprises in the Americas to renew their industries through digitalization. At the same time, the strong education and training aspects and the abundance of talent have contributed to a large pool of talented entrepreneurs, which has kept the region a world leader in terms of entrepreneurial spirit and creativity. This allows the Americas to stay at the forefront of digitalization (Yli-Viitala et al., 2020).
For Europe, the main reason for being at the forefront of digital development is that they started to follow the recommendations of the Organization for Economic Cooperation and Development (OECD) 20 years ago to focus on and address the issues arising from digitalization and digital transformation. As a result, about one-fifth of the European workforce can work from home and enjoy the benefits of digitalization nowadays (Vasilescu et al., 2020). Due to the economic impact of Covid-19, Europe has increased its deployment and investment in digital technologies and encouraged enterprises to undergo digital transformation, which has contributed to the development of digitalization in the European region (European Commission, 2021).

Digitalization in Asia is also developing rapidly. China in the region, for example, has the world's largest digital consumer market, making it a powerful digital competitor in recent years. The new edition of the Digital Rise Report (2021) by the ESCP European Business School's European Center for Digital Competitiveness analyzes the digital competitiveness of 140 countries and provides a global ranking. In recent years, China has soared to first place in terms of digital competitiveness in this ranking. The reason for this is China's comprehensive push for entrepreneurship and innovation. Its "China 2025" initiative provides state support for ten key areas to become a world leader (Philip, 2021).

According to China's state Internet information office issued the 2020 "digital China development report," China's government services, new crown mobility monitoring analysis, scientific research and deployment of medical supplies, and docking of supply and demand, industry and the government to speed up the use of various resources and reasonable development sustainability digital reform. Moreover, within the G20, the ranking reveals strong dynamics also regarding the two global digital superpowers: China has made significant progress in digital competition. It is also notable for its digitally empowered industries, which present opportunities for global development.

China has had strong digital competitiveness in recent years, which shows that many enterprises in China have been going through digital transformation in the past few years. There are three phases that enterprises need to go through for digital transformation which is: Phase 1 is digital coding, which refers to the digitization of devices and products. The
second stage, digitalization, refers to the transformation of business processes through digital technology to improve efficiency. The third stage, digital transformation, involves a strategic change in the business operating model. Each stage yields different dividends (Zheng et al., 2021).

Whether an enterprise succeeds or fails in going through all three stages of digital transformation, there are employees in the enterprise who are either quietly working on or preventing the digital transformation. Studies have shown that employee engagement, job satisfaction, and organizational commitment are critical to an enterprise's progress in completing its work (Nielsen & Randall, 2012). One of the most crucial aspects that businesses need to consider when it comes to implementing digital transformation is engaging their employees (Dalal et al., 2012). Therefore, if enterprises want to carry out digital transformation successfully, they need to understand employee perceptions of corporate change to remove these barriers to successful digital transformation. This study will then identify the barriers that prevent them from successfully implementing digital transformation.

1.2 Problem formulation
Based on the previous study, it is important for corporate enterprises to conduct digital transformation during the age of the fourth industrial revolution (Pereira et al., 2022). In the digital age, promoting the transformation of enterprises will also bring about significant changes for enterprises themselves (Fachrunnisa et al., 2020). The application of digital technology has fundamentally changed work structures and business processes (Hanelt et al., 2021). Digital technology is an indispensable part and plays an active role in the digital transformation of an organization (Tsah & Chen, 2021). Nevertheless, more importantly, digital leadership plays a key role in digital transformation and is one of the critical factors in its success (Kane et al., 2019). However, there is a great deal of literature exploring the relationship between leadership and digital transformation, although it often neglects the employee's perspective on digital transformation.

According to McClanahan (2020), research indicates that leadership behavior should focus more on employees. Hence it is very important to lead employees to embark on digital transformation (Weber et al., 2022). However, employee resistance is the main
reason for the failure to lead organizational change (Bovey & Hede, 2001). Therefore, based on previous literature on employees' reaction to organizational change and its impact, researchers found few relevant studies on employee perceptions of enterprise change and innovation, especially in digital transformation. Consequently, much uncertainty still exists about the relationship between employee perceptions and digital transformation. There remains a need for an efficient method that can illustrate how employee perceptions influence resistance toward digital transformation.

Moreover, recent studies have increasingly recognized that China in the digital age deserves further discussion (Gao, 2020). Yan (2021) describes the current situation of enterprises' digital transformation in the Chinese market from five dimensions strategy, resources, process, capability, and performance. Moreover, based Zheng (2021), it fully illustrates the impact of digital transformation in China and how to promote the strong development of China's domestic market. As with the previously mentioned literature, much of the current research is about the basic status and impact on the Chinese market. Based on this body of literature, and to further investigate the Chinese digital transformation landscape, the researchers have turned their attention to the Chinese market.

While the current state of digitization in China's business field, the opportunities, and challenges that digital transformation as a whole presents to enterprises have been studied. It is still worth from microfoundations’ aspects to explore further how internal employee perceptions affect the digital transformation of enterprises in China. Hence, the gap analyzed microfoundational perceptual mechanisms trying for resistance in the digital transformation of China.

1.3 Purpose
The purpose of this thesis is to investigate the impact of resisting the digital transformation of enterprises from the perceived dimensions of their employees, in order to try to provide theoretically informed recommendations for the development of digital leadership in the digital age. By studying the basic knowledge and general information on digitalization, digital transformation, the two main elements of digital transformation and its importance, as well as the relationship between digital leadership and employees.
Learn how the personal element influences resistance to organizational change by studying the basic concepts and general knowledge of resistance to organizational change. Also studying basic concepts and theoretical knowledge of microfoundations, keeping track of the personal elements of individuals have an impact on organizational change.

Look for the impact that the personal elements of employees bring to the development of organizational transformation, understand the impact specifically in terms of the perceived dimensions of employees. An attempt is made to examine how digital leadership should develop in the digital age in terms of the implications brought about by the above. For further study, utilizing the Chinese digital market context as a research environment to develop the knowledge.

In order to guide for exploring the study, the researchers propose the Research Question to this study:

*How do employee perceptions influence resistance towards the digital transformation in China?*

1.4 Definition

**Digitalization:** Digital transformation is a process that involves the use of various digital technologies to improve the efficiency and effectiveness of an enterprise's operations. It can also help transform the way that business is conducted. Digitization means converting all information types (text, sound, visual, video and other data from a variety of sources) into the digital language (Reis et al., 2020).

**Digital transformation:** The integration of digital technology in the digital economy to achieve essential business benefits is known as digital transformation. Digital transformation impacts an enterprise's structure and strategy to adapt business models to new technologies. Enterprises could consider harnessing the innovation ecosystem, redesigning internal structures, and increasing digital maturity for digital transformation (Fachrunnisa et al., 2020).
**Digital leadership:** Digital leadership is about driving digital transformation forward while giving subordinates more freedom. And digital leadership requires focusing on the entire enterprise rather than just on building digital infrastructure (Bach & Suliková, 2021).

**Digital technology:** Digital technologies include digital artifacts, digital platforms, and digital infrastructure. It can be a standalone software or hardware component on a physical device or part of an ecosystem on a digital platform. In addition, it is also a digital technology tool and system for providing communication, collaboration and other support for innovation (Nambisan, 2017).

**Resistance to change (RTC):** RTC is viewed as multidimensional and includes behavioral dimension, cognitive dimension, and affective dimension. The behavioral dimension refers to how individuals react to change, the cognitive dimension refers to their perceptions of change, and the affective dimension refers to how they feel about change (Erwin & Garman, 2010).

**Employee perceptions:** Employee perceptions is defined as a process by which employees manage and interpret their impressions of the sensory so as to give meaning to their environment (Panimalar & Kannan, 2013).

**Microfoundation:** Individual-level factors include the defined nature of the individual, such as personality, competencies, and skills (Felin, 2012). When applying the concept of microfoundations to the context of individuals and organizations, organizations can be seen as collections of individuals (Aime et al., 2010; Barney et al., 2013).
2. Theoretical framework

To ensure adequate literature support for this thesis, at least 80 academic articles were included in the thesis. In addition, the majority of the literature used is from 2000 to 2022 to ensure that relatively new literature is used in the thesis discussion. Based on the literature of employee perceptions, the literature cited in this literature review dates back as far as 1975. Because the issue of digital transformation is still relatively new, most of the literature was at the stage of around 2020.

After determining the research problem and purpose of this thesis, the academic literature of this thesis is mainly collected from two databases, namely Google Scholar and the school library–Primo of JU Library. In order to collect the academic literature efficiently, this thesis uses the following keywords relevant to the topic for query: “Digital transformation”, “Digital technologies”, “Digital leadership”, “Enterprise digitalization in China”, “Chinese employee”, “Employee perceptions”, “Employee resistance”, “Resistance to change”, “Microfoundations”, “Organization environment”, etc. In the literature review, the keywords “Digital transformation”, “Digital technologies”, “Digital leadership”, “Resistance to change”, “Employee perceptions” are explained as core concepts in conjunction with various academic literature as follows:

2.1 Digital transformation

Most enterprises today are undergoing digital transformation. The dividends generated by the digital transformation of enterprises have created larger niches, greater competition and new markets, prompting more enterprises to choose digital transformation (Galindo-Martin et al., 2019). Digital transformation is the application of new digital technology to large business improvements in operations and markets, such as increasing customer experience, streamlining procedures, or establishing new business models (Paavola et al., 2017). This phenomenon is termed as digitization, and it refers to business models that are driven by advances in digital technology's use in all aspects of human society (Stolterman & Fors, 2004). Today's environment is demanding and competitive, enterprises need to use digital technologies to achieve change and creative disruption to seek opportunities (Crupi et al., 2020).
The Chinese government sees the need to accelerate the digital transformation process of enterprises to drive technological progress, efficiency improvements and organizational change. To construct a new form for economic and social growth that heavily relies on digital technology (Xue et al., 2022). However, digital transformation has a consequence on more than simply business-related digital technologies, and their structure and strategy for adapting their business models to new technologies (Warner & Wäger, 2019). The three primary approaches to digital transformation involve concentrating on the customer value proposition, restructuring the business approach, or integrating both strategies. Strategic objectives, industry climate, competitive obstacles, and customer expectations all shape the optimal route for an enterprise (Berman, 2012). The three approaches to accomplish digital transformation are to tap into the innovation ecosystem, rethink internal structures, and improve digital maturity (Warner & Wäger, 2019).

Digital transformation for businesses requires retooling operating models, reinventing products and services using digital technologies, information and customer engagement (Berman, 2012). The challenges and obstacles that this process poses to enterprises are lack of appropriate financing possibilities, IT security issues, inadequate digital skills of employees, shortage of IT specialists in the external labor market, internal resistance to change, lack of knowledge of managers on how to accomplish change, the uncertainty of future digital standards, etc. These barriers are usually divided into organizational, legal and environmental factors, which are essential; however, the most important factors are human, technical and financial (Ramona et al., 2022).

There are two main factors that have been studied in human capital: individual factors and social factors. Individual factors include things such as individual knowledge, skills and abilities, while social factors include social capital, organizational culture and so on (McPherson et al., 2001). Much of the focus on micro-foundations fundamentally revolves around human resources, which is a critical aspect in an organization’s success or failure (Foss & Lindenberg, 2013). Microfoundations provide a perspective on the study from the individual to the organization, described further in the following parts.
In order to undertake digital transformation, enterprises need to develop management competencies, such as workflow design, business strategy training, and digital literacy competencies for human resource investments. Enterprise digital transformation should not be restricted to IT and information systems investments. However, at a superior stage, it should emphasize business operations, products, and business models (Olivia et al., 2020). Meanwhile, employees will need and request the acquisition of relevant competencies in order to use digital technologies in a variety of circumstances and for a number of purposes: new skills and information, work organization and managerial skills, and other characteristics that will become a vital aspect of development (Bikse et al., 2021).

2.2 Digital technologies

Digital technologies are key technologies for the realization of new products and services. These technology-based business approaches constitute the main enablers of powerful manufacturing systems and network concretization, providing high value-added, user-oriented products and services (Mourtzis et al., 2015). Digital technologies play an important role in digital transformation, enabling inter-firm collaboration, information storage and analysis, and improved customer service performance in almost every organization. They have a significant impact on customer service performance and enhance the ability to achieve service facilitation (Foroudi et al., 2017). Digital technologies are described as a collection of technology and approaches for digital modeling of global product development and realization processes in a lifecycle management system (Maropoulos, 2003).

Digital technologies are divided into three distinct while related elements: digital artifacts, digital platforms, and digital infrastructures. The digital artifact is typically a media content or component that is part of a new service or product and provides specific functionality or value to the end-user. A shared set of common services and architecture for hosting complementary products (including digital artifacts) is defined as a digital platform. Digital technology tools and systems that are infrastructured by digital, facilitate communication, collaboration, and/or processing capability to help in innovation and entrepreneurship (Nambisan, 2017).
2.3 Digital leadership

As mentioned above in digital transformation, one of the barriers to it is the lack of knowledge of managers on how to accomplish change. Due to the emergence of digital transformation in the enterprise, it needs a leadership style that allows for decision-making in complex environments, facilitates digital transformation and continuous digital innovation, and promotes and spreads a transformative digital culture throughout the organization (Kane et al., 2019). Digital leadership is a key skill that managers must have to undertake digital transformation. Through digital leadership, business leaders may create a clear and compelling perspective for the digitalization and implement projects (Saputra, 2021).

Digital leadership is the ability of an enterprise to leverage the digital, marketing, digital leaders' commercial and strategic leadership talents to lead and manage multidisciplinary teams (digital and non-digital skills) to accomplish enterprise digital transformation (Benitez et al., 2022). Digital leaders need to have management competencies such as workflow design, business strategy training, and digital literacy competencies for human resource investments (Olivia et al., 2020). Digital leadership is characterized by using the organization's digital resources to achieve organizational goals and objectives. Digital leadership may be at two levels: individual and organizational (Shah & Patki, 2020). Therefore, leadership in digital transformation is critical to carry and support an organization through its digital transformation journey. Effective digital leadership can help organizations establish better workflows and methods to allow for new operations.

Digital leadership is defined by the International Society for Technology in Education (ISTE) as competence in “professional practice”, “visionary leadership”, “a digital learning culture”, “digital citizenship”, and “systemic improvement” (AlAjmi et al., 2022). Westerman (2014) identifies the competencies needed for digital leadership as crafting a digital vision that is transformational, employee engagement and empowerment, concentrating on digital governance, and creating a digital leadership framework. Engagement and empowerment, a focus on digital governance and the creation of a digital leadership framework (Westerman, 2014).
Meanwhile, in another article, Westernman explains that the five competencies of digital leaders that positively impact organizational success are the ability to share power and teach people to make good decisions; the ability to foster a collaborative environment; the ability to adapt to change; the ability to communicate effectively; and the ability to establish credibility and trust (Westerman, 2014). And one of the most critical leadership competencies is the ability to develop a transformative digital vision and inspire others through engagement (Eva and Francesco, 2021).

2.4 Resistance to change
Large-scale breakthroughs in technology, industrial processes, management practices, or payment of salaries systems that fail to fulfill expectations or fail entirely are frequently attributed to resistance to change (Oreg, 2006). Piderit (2000) illustrated that resistance to organizational change is considered to be multidimensional and includes behavioral dimension, cognitive dimension, and affective dimension. These three dimensions interact with each other and can also contradict each other in all three dimensions at the same time. To further explain, employees' feelings, behaviors and thoughts do not necessarily change in unison. Such negative feelings may lead to non-negative behavior.

Resistance to change makes organizational change difficult. Wayne & Andy (2001) suggested that human factors are key, particularly cognitive and affective factors, in reducing the level of resistance to organizational change. Di et al., (2014) argue for the necessity to look at resistance to change from several perspectives, with a focus on the individual. Laumer et al., (2016) identified other common individual variables, such as age, gender or work experience, as also having an impact on resistance to change. Perceptions of microfoundations trace the relationship between individuals and organizations for reasons mentioned when a person possesses a certain ability, preference or skill that can be traced back to a person's level of education, parents or even genes. It can also be attributed to an employee's previous work experience, daily activity behavior, social and relational networks, etc. (Schaffer, 2003; Hodgson, 2012; Winter, 2012; Barney et al., 2013).
In research, there is no universally accepted definition of resistance to change, and much disagreement exists. This disagreement reveals the complexity of resistance, individuals and the relationships between them (Erwin & Garman, 2010).

2.5 Employee perceptions
Central to understanding organizations is the study of the interactions between individuals and organizations, looking more closely at the actual micro activities, behaviors and processes of organizations (Abell et al., 2008; Barney et al., 2013). It is surprising how interactions between individuals can lead to collective outcomes, whether positive or negative (Macy & Willer, 2002; Cederman, 2005; Felin et al., 2012). Employee perceptions depend on how they consider and understand the specific situation that changes cause and the impact of changes brought to them (Woodman, 1995).

Research by Jones et al., (2008) highlights the uncertainty associated with change. However, employees focus more on the positive or negative outcomes of change. In this process, employees' attitudes are usually positively correlated with perceived outcomes, meaning that they maintain a positive attitude towards outcomes they perceive as positive and conversely maintain a negative attitude towards negative outcomes (Cullen et al., 2014). Liu & Perrewé (2005) proposes a cognitive-emotional model of organizational change to demonstrate the impact of emotions on employees' personal attitudes and behaviors. Ashkanasy et al., (2002) also constructed two event-emotion matrices: positive and negative emotion matrices. According to Avey et al., (2008), the positive emotions of employees can have a positive impact on organizational change. Most literature focuses on arguing the benefits of positive emotion (Fredrickson, 1998; Fredrickson, 2001; Staw et al., 1994). However, the negative emotion occupies the leading status of resistance to change (Maitlis & Sonenshein, 2010; Kiefer, 2005; Shepherd & Cardon, 2009).

Fredrickson (2001) proposes that emotions arise from an individual's perceptions of certain events, which may be conscious or unconscious in the process. And further elaborates that the tendency to react is mainly expressed in 'subjective experiences,' 'facial expressions,' 'cognitive processing,' and 'physiological changes.' Generally, joy, interest, satisfaction, pride and love are considered as positive emotions, while negative emotions involve anxiety, sadness, anger and other emotions that plague the individual
(Cabanac, 2002). Cacioppo et al., (1999) noted that individuals with positive attitudes help to regulate and accept the behavior, and Fredrickson (2001) further states that they can be motivated to integrate into their environment and participate in activities. It has been found in the past literature that because positive emotions contribute to approaching behavior, individuals are able to try and explore new areas to a certain extent. Therefore, when an individual is confronted with a positive personal perceptions of an event, there is a certain degree to reduce resistance, acceptance and integration into events as soon as possible.

Since organizational change is usually related to the increase in employees' stress levels and insecurity (Dahl, 2011). A number of studies state that employees with a range of negative emotions such as tension, anxiety, and apprehension are more likely to resist enterprise change (Vakola et al., 2004; Helpap & Bekmeier, 2016). Employees who are personally inert and willing to blame themselves tend to avoid engaging in challenging and risky activities (Ellis & Harper, 1975) and are therefore prone to abandon difficult tasks and avoid self-responsibility, thus resisting the changes brought about by organizational change and innovation (Bovey & Hede, 2001).

Previous research has found that there is a negative emotion remaining skeptical and weary of various forms called cynicism (Dean et al., 1998), one of the driving forms of resistance to organizational change implementation as well (Bergström et al., 2014; Stanley et al., 2005; Ahmed, 2016). Reichers et al., (1997) argue that people become cynical and pessimistic about organizational change partly because of the experience of unhappy change failure. However, it is explored that when unable to cope with organizational change, emotionally resistant employees are more likely to leave (Aslam et al., 2015), while the insecurity caused by behavioral resistance increases employee withdrawal and reduces job satisfaction (Aslam et al., 2016). Moreover, Aslam et al., (2016) further explained that the main source of employee cynicism is the fear of the unknown caused by forced or compelled withdrawal from the comfortable workplace and showed that the behavioral and emotional resistance of employees could lead to the increase in negative feelings toward organizational change to resistance.
Furthermore, related to employment security, previous literature has highlighted that employee job security plays an important role in organizational change responses (Probst, 2003; Oreg, 2006; Burke & Greenglass, 2001). Kiefer & Müller (2003) analyzed that employees would worry about their status and development in the organization and have negative emotions about the change to resistance. For further identification, Kiefer (2005) identifies personal status as the one of main factors that affect emotion in change.

2.6 Hypothesis Development

The essence of digital transformation is a process of organizational change, leveraging digital technology to transform organizational value generation (Vial, 2019). As the overall objective of making organizational change is to improve performance (Boeker, 1997) as well as the novelty of digital transformation (Vial, 2019), leads enterprises to actively look for ways to transform successfully. Digital technology is a vital part of digital transformation (Foroudi et al., 2017). Another important element in digital transformation is digital leadership (Saputra, 2021). It follows that resistance may have an impact on organizational change. Because resistance can impede the process of transformation, although there is debate about the content of resistance to change influencing factors. Wayne & Andy (2001) identified the cognitive and emotional elements of the human factor as key factors in reducing organizational change.

However, when employees are part of the transformation, they may have negative feelings about the change, which may lead to negative behaviors and eventually cause resistance to the change. Employee perceptions are usually positively correlated with their perceived outcomes, i.e., positive employee attitudes correspond to positive outcomes (Cullen et al., 2014). Resistance is a rational expression of one's true preferences (Nord & Jermier, 1994). Research shows that when lower status members of an organization share a common understanding, it helps to promote organizational change (Haslam & Reicher, 2012). Some sources of resistance to change may be due to changes in employee perceptions that have an impact on organizational change (Nord & Jermier, 1994; Oreg, 2006). The process stage is considered most likely to influence employee perceptions (George & Jones, 2001; Robbins et al., 2000).
In the context of this thesis, the application of digital technologies in digital transformation in organizations is seen as a digital tool. The negative perceptions of employees are seen as resistance to digital transformation. From previous findings and existing knowledge, no studies have investigated what impact employee perceptions will have on resistance to digital transformation.

Therefore, the hypotheses are as follows:

**Hypothesis 1:** the functionality of digital tools has a positive effect on employees' resistance to digital transformation.

**Hypothesis 2:** employee perceptions of digital leadership have a positive effect on their resistance to digital transformation.

However, the nature of the constituent individuals, i.e., employees, and their interactions within or between organizations need to be carefully specified. The interactions between individuals may lead to collective outcomes, positive or negative, that are surprising (Macy & Willer, 2002; Cederman, 2005; Felin et al., 2012; Piderit, 2000). Considering the negative impact that employee perceptions have, probably will lead to positive results based on the previous findings, the followings are hypothesized:

**Hypothesis 3:** the functionality of digital tools has a negative effect on employees’ resistance to digital transformation.

**Hypothesis 4:** employee perceptions of digital leadership have a negative effect on their resistance to digital transformation.
3. Method

3.1 Empirical setting

3.1.1 Epistemology or philosophy

Epistemology is the structure of a body of knowledge or reasonable beliefs (Steup & Neta, 2005). Epistemology has evolved from the past to include positivist, realist, constructivist and other approaches. Realism refers to the view that assigns to known things an existence or nature that is independent of whether anyone perceives them or not (Hale, 2020). Constructivism is a cognitive model that can be used to construct epistemology, which is inter-subjective rather than objective knowledge compiled in manual construction, aggregation studies and hypothesis testing by the research (Thompson, 2002).

The two methodologies mentioned above can be seen as ways of studying the truth of a thing or theory. Positivism employs epistemology, which explains real events through empirical observation and logical analysis (Kaboub, 2008). It is a description of an event that is deduced from a class of highly correlated theories. Discovering explanatory or predictive knowledge is the aim of positivists. From these theories, together with observable facts, observations are made to derive descriptions of events. The occurrence or non-occurrence of these events is a test of the theory's validity, as well as what the theory potentially predicts and explains (Keat, 1971). The test of the validity of a theory is whether the predictions based on that theory are consistent with the information have been given. The positivist approach to research advocates the study of the relevance of micro-level factors in a number of specific contexts (Kaboub, 2008). This thesis presents four theoretical hypotheses by reviewing past scholarly research on the specific context of digital transformation and reviewing the micro-level findings of digital technology, digital leadership, resistance to change and employee perceptions as they relate to digital transformation. The results are analyzed by testing the validity of the hypotheses through the actual data collected and comparing the consistency of the theories obtained from the previously reviewed literature. Thus, a positivist approach is adopted in this thesis.

3.1.2 Deductive method
There are three different kinds of reasoning to draw inferences or conclusions from the evidence, which are deductive, inductive and abductive, respectively (Stephens et al., 2018). Inductive reasoning refers to ‘draw conclusions by going from the specific to the general’ (Bhandari, 2022). In addition, inductive methods provide a convenient way to analyze qualitative data (Thomas, 2003). By summarizing the raw data into a streamlined textual format, conclusions can be drawn and links to the research objectives can be established (Thomas, 2006). Related to Deductive reasoning, which is defined as developing and verifying a conclusion from a valid premise (Johnson-laird, 1999). However, the distinction between deductive and inductive approaches is that the former is used to evaluate an existing theory, whilst the latter is used to construct a theory from particular observations to a broad summary and generalization (Streefkerk, 2019).

Moreover, the abductive method begins with empirical phenomena that cannot be explained by the scope of the theory and yields the best prediction based on incomplete observations, while with a probability of conclusion existence (Saunders et al., 2012). Therefore, based on collecting information about employee perceptions of enterprise digital transformation as a hypothesis or theory, this study takes a deductive approach to test the theory by explaining the phenomenon of employee resistance to corporate digital transformation from a microfoundations perspective.

### 3.1.3 Research approach

Research methods can generally be divided into quantitative and qualitative analyses, and the analytical methods used to differ in the way data are collected (Gelo et al., 2008). In the process of selecting a research method, one can choose either one of these two approaches for analysis or a mixed approach (Saunders et al., 2019). Qualitative methods tend to reorganize the individual participants' personal views, experiences, and understandings, while quantitative methods try to explain whether the observed phenomenon and its relationship with the study confirm the predictions (Gelo et al., 2008). Quantitative analysis can be used as a powerful tool to confirm or validate what happened in the past and phenomena that may affect the future through the analysis of data (Nicholas, 2015). This research thesis focuses on exploring how employee perceptions resist digital transformation and requires the collection of a large amount of data to
explore how different employees resist mentally and behaviorally. Quantitative analysis was chosen to help this thesis establish relevant facts about the topic in the form of figures and charts.

Bryman (2006) noted that in the quantitative approach, collecting data through structured interviews and questionnaires often dominated. During the research process of the thesis, the researchers were unable to conduct structured interviews in the target market due to the impact of COVID-19. In addition, the interviews were able to explore in-depth, the sample size collected was too small to represent the true perceptions of the majority of employees. However, questionnaires can help researchers capture and collect data more broadly and more quickly. Therefore, in this thesis, the researchers carried out the survey and quantitative analysis to simplify the phenomenon of how employee perceptions resist digital transformation into numerical values for convenient statistical analysis.

3.2 Data collection

3.2.1 Primary & Secondary data

To better conduct the study, the researchers consider both primary and secondary data as data collection. The ordinary data collected for an existing specific research purpose is called primary data, such as interviews, questionnaires, observations, etc. (Rabianski, 2013). In this study, the researchers used a survey as the primary data. Due to the novelty of the topic of this study, no research has been conducted deeply in this field. The researchers felt that it was most appropriate to create and collect primary data specific to this research question. The primary data collection strategy used for the study was a web-based survey (Hox & Boeije, 2005). In this case, a self-administered questionnaire was chosen. This was due to the fact that it was easier to administer and less time-consuming, as well as easier to collect huge amounts of data and require less cost. The distribution method is online, and there exists a large number of web-based, which makes the questionnaires easy to design. Web-based tools enable researchers to create their own questionnaires online and to reach the required respondents through social media tools. Online surveys offer a variety of advantages, including greater geographical access and excellent adaptability to respondent groupings. The survey conducted is an example of
primary data, where the survey was sent out to collect data directly from those who responded to the survey, and questionnaires are also primary data.

Secondary data are data that have been created by other researchers with materials for their own purposes and are readily available to current researchers (Hox & Boeije, 2005). The use of secondary data can be used to further expand and enhance existing data (Horn, 2018). However, since no research has focused on the topic of employee resistance to digital transformation, there is no secondary data conducted in the thesis.

3.2.2 Survey

The researchers sent out a survey in order to gather information from employees to see how their perceptions affect resistance to digital transformation in China. The survey was conducted using Wenjuanxing, a questionnaire platform that is used very frequently in China. As the survey environment was in China, the researchers chose a questionnaire platform that Chinese people are more familiar with using. The researchers constructed 14 questions and then analyzed and presented this information. The researcher designed the questionnaire content in the form of single-choice, multiple-choice, fill-in-the-blank, matrix single-choice, and scale questions.

In order to better survey the population, the social networking software in China: WeChat, similar to Facebook, was used as the main channel for posting questionnaires (Zhang et al., 2020). The researchers posted the link to the questionnaire as well as the QR code in the group or on the dynamic home page to make it more convenient for the participants to fill out the questionnaire online. The questionnaire was posted for a week and 254 responses were collected. Since the target market is in China, the questionnaires are in Chinese for the convenience of the participants to read and fill out. The relevant statistics and analysis used for this study will be further explored after translation from Chinese to English.

The questions used in the survey were discussed and shaped based on the findings of previous research scholars on personal perspectives in order to gather as much dimensional and useful information as possible. They were formed so that the researchers
could see employees' personal perceptions of digital transformation in the organization. They are then analyzed in relation to the content of previous research collected by the researchers on resistance to change, personal perceptions, organizational change, and digital transformation.

The analysis of how previous research has influenced the resistance to change in the context of the digital transformation of enterprises. As mentioned earlier, in addition to the survey, the results of past research on relevant content by researchers were collected and integrated as research variables. These findings were collected and integrated from academic articles. The researchers considered China to be the most appropriate context for the study, since it is among the most advanced nations in terms of digital transformation and the digitalization process is in the world's leading position (Philip, 2021). The researchers read a variety of basic information on digital transformation, and because of the large number of Chinese enterprises undergoing digital transformation, the wide range of industries involved in the transformation, and the number of small, medium and large enterprises involved in the transformation, the researchers considered the chosen China to be the most suitable for this study.

3.2.3 Sampling procedures and samples

According to the research question, the researchers study the impact of employee perceptions on digital transformation. As a result, the target population to be surveyed is employees. The minimum age of the target survey population is 18 years. In the selection of the age group, the minimum target population was chosen to be university students with work experience. In China, the minimum age for higher education is 18 years old (Davey et al., 2007; OECD Indicators, 2021; icef Monitor, 2017). The survey was conducted using a snowball sampling method. This was carried out using snowball sampling in order to collect a greater degree of similar respondents, i.e., employees (Etikan et al., 2016). Respondents were sourced from researchers' friends, relatives, family, and colleagues, firstly; then throughout the social networks of the first respondents, for instance, their colleagues and friends.
The researchers of this thesis have filtered the data based on the response time and content of the responses and removed 81 data. Removed 16 data for response times under 120 seconds (average response time 450.7 seconds). Because too short a response time can affect the accuracy of the answer (Huang et al., 2012). 16 data on blind questionnaires with jumbled and invalid responses were removed (e.g., responses to question 6 of the questionnaire, responses on “none” or non-digital tools). Questionnaires 10-13 are multi-topic scale questions. According to Curran's method, half and more consecutive identical responses are considered invalid and are removed (Curran, 2016). The final data was filtered as described above, leaving 173 valid data for the following analysis.

3.3 Operationalization

The questions used in the questionnaire were mostly based on previous literature and adapted to the purpose of the study. In order to collect data as accurately as possible in relation to the purpose of the study. To measure employee perceptions, the researchers asked two questions: one was to evaluate the functionalities of digital tools in use in the workplace; the other was, to evaluate leaders’ digital leadership in the workplace. These items are based on previous research on two important factors influencing digital transformation (Berman, 2012; Ramona et al., 2022; Bikse et al., 2021; Dalal et al., 2012; Yli-Viitala et al., 2020; Saputra, 2021).

The independent variables were employee perceptions of digital tools and digital leadership, based on employee perceptions of how simple the use of digital tools and attitudes towards their use, and employees' positive or negative evaluations of the digital leadership shown by leaders in the workplace. This variable is measured by the following two questions: "Your opinion on the use of digital tools in your work environment," and "Please evaluate whether the following statements are realistic in relation to your perceived competence in digital leadership in the workplace". These questions are based on the integration of literature from the previous theoretical framework section (Foroudi et al., 2017; Olivia et al., 2020; AlAjmi et al., 2022; Jones et al., 2008; Cullen et al., 2014).
Both questions were measured by multi-item perceptual scales. In order to obtain as many aspects of employee perceptions towards the above two questions as possible, as well as to improve predictive validity (Diamantopoulos et al., 2012). Five items, “I am intimidated, frustrated or exhausted by using digital tools”, “I am sick of learning new digital skills and hearing about new digital skills”, “I don't know how to deal with the problems that arise with digital tools”, etc., representing the functionality of digital tools in the workplace. Six items are used to measure employee perceptions of the digital leadership of their leaders in the workplace: “My leader is well aware of the changes that the digital economy environment is bringing to organizations”, “Training in digital skills is sufficient to bring the skill level of my leaders up to the level required for management,” etc.

The dependent variable is employee resistance to digital transformation. Measuring employee resistance involves the measurement of employee perceptions. A single item is used to measure resistance. Good single-item scales will also have good predictive validity, as will multi-item scales (Bergkvist & Rossiter, 2009). The following question was asked, "You resist digital transformation."

All of the scale questions used a 5-point Likert scale (from strongly disagree to strongly agree), which is considered to be a valid and reliable measure of subjective preference thinking (Joshi et al., 2015). It was used to indicate the respondents' level of agreement with the questions.

3.4 Data analysis

After the data was collected, the data was presented in bar charts for the single-choice, multiple-choice questions, matrix single-choice questions, and scale questions. The researchers used excel to summarize and enter the data from the online questionnaire and gave each questionnaire a number. Finally, the statistical software Statistical Package for the Social Sciences (SPSS) was applied to test the hypothesis and further analysis was carried out.
PCA is a multidimensional statistical technique that analyzes the structure of observed variables and simplifies the data set into a new collection of variables called principal components in order to extract crucial information from a table (Abdi & Williams, 2010). In this questionnaire, the tenth question deals with five questions on employee perceptions of digital tools and the eleventh question deals with six questions on employee perceptions of digital leadership. In order to better analyze the two main variables of employee perceptions of digital tools and employee perceptions of digital leadership, a principal components analysis was conducted for questions tenth and eleventh respectively to demonstrate that several of the questions involved were related to the main variables.

The Spearman rho test is performed by using data from two variables and testing whether they are correlated with each other. Moreover, before using the Spearman correlation test, it is necessary to make sure that the set independent variable and the dependent variable can be ranked, the purpose of which is to observe whether the other variable follows a monotonic relationship when one of the variables is increased (Akoglu, 2018). Spearman correlation coefficients range from +1 to -1. Positive and negative signs indicate the direction of the correlation, and the strength of the correlation is 0 to +1 and 0 to -1 (Xiao et al., 2016). The three variables created in this thesis are employee perceptions of digital leadership, employee perceptions of digital tools, and employee resistance to digital tools.

3.5 Validity and Reliability

The degree of accuracy with which a method measures what it is designed to measure is referred to as validity. An experiment with high validity delivers results that are accurate representations of genuine traits, characteristics, and changes in the physical or social reality (Heale & Twycross, 2015). This article will analyze the data collected in the questionnaire and the content is thematically focused on ensuring the validity of the experiment. Further, the data is tested for significance between dependent and independent variables using a p-value. The p-value is the probability of rejecting or failing to reject the original hypothesis. The most commonly used p-value level is 0.05, which may be adjusted in some cases (Dahiru, 2008). A p-value below 0.05 signifies that the
relationship is significant and does not occur by chance. In this experiment, the p-value was set at 0.05, which is sufficient to go on to prove the hypothesis of a significant relationship.

Reliability is related to the consistency of measurements. It is guaranteed that there should be approximately the same response in each measurement. Although an exact calculation of reliability is not possible, estimates of reliability can be achieved through different measurement methods (Heale & Twycross, 2015). The Cronbach's alpha test will be applied in this thesis and functions as internal consistency assessment or multiple items' reliability, evaluations or assessments (Bonett & Wright, 2015). Alpha values for Cronbach range from 0 to 1, with higher values meaning that items measure the same dimensions. Conversely, a Cronbach's alpha value close to 0 means that some or all items selected are not measured from the same dimension (Bujang et al., 2018). In this experiment, the Cronbach alpha for the five questions on employee perceptions of digital tools was 0.887 and for the six questions on employee perceptions of digital leadership, the Cronbach alpha was 0.882. This demonstrates the high reliability of the questions in this study. The appendix shows below.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Cronbach's Alpha</th>
<th>N of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital tools</td>
<td>0.877</td>
<td>5</td>
</tr>
<tr>
<td>Digital leadership</td>
<td>0.882</td>
<td>6</td>
</tr>
</tbody>
</table>

*Table 1 Reliability on variables*

3.6 Ethical Consideration

To ensure the ethical nature of the study, this questionnaire was used to collect data in a completely anonymous manner and was used only for this thesis study. On the one hand, the participation of the participants in the questionnaire was voluntary and without any compulsion. They could also withdraw at any time if they felt uncomfortable during the process of completing the questionnaire. On the other hand, it was clearly stated on the first page of the questionnaire that the purpose of the questionnaire was for reference purposes only and that it was anonymous in strict accordance with the General Data
Protection Regulation and the Personal Information Protection Law of the People’s Republic of China, and would not cause any adverse effects on the individual. Finally, participants also have the right to be informed about their completed questionnaires, to be able to download and view their responses and to be informed about how the data will be used. The contact details of the researcher will therefore be provided in order to answer any questions that the participants may have regarding the questionnaire.

3.7 Limitation

There are still limitations in conducting the data collection process. First, the time period for collecting primary data was one week. Since the sample data were collected for a short period of time and were not large enough, and their distribution did not cover all regions of China, thus the results may differ from the established facts. A more accurate and in-depth study might have been obtained if more time was available for in-depth research. Secondly, the data collected in this questionnaire are some of the current thoughts related to digital transformation at the time of completion by the respondents, and different results may occur depending on the time of year or the number of completions. However, the respondents who participated in this study only took part in filling out the questionnaire once.

Lastly, one of the limitations of questionnaire surveys is that personal data may be inaccurate and the possibility that respondents may have provided incorrect answers or randomly selected answers in the course of answering the questionnaire cannot be ruled out. Thus, the data collected cannot be fully guaranteed to be filled in by the participants as they really are. Moreover, because of the novelty of the topic, respondents may not be familiar with the digital transformation of enterprises. Although the researcher gave hints in the questionnaire to facilitate the respondents' understanding, there were still cases where the respondents could not fully understand the answers they were given in the questionnaire. Finally, the researcher formulated the aspects and questions that the researcher hoped to understand when developing the design of the questionnaire, and due to the lack of comprehensiveness of the consideration, the possibility of the existence of certain issues may have been overlooked thus leading to the limited scope of the study.
4. Results

4.1 Findings from the survey

After sampling the data, the researchers were left with 173 data, which had a validity rate of approximately 0.68 (254 respondents were collected in total). In the first question of the survey the age of the respondents was divided into five categories, namely 18-25, 26-35, 36-45, 46-55, and above 55 (See Figure 1), with the majority proportion of respondents aged 45-55 with 28%, aged 26-35 with 26%, and 35-45 with 25%. And 18-25 taking up 8%, over 55 with 13%. Related to gender, respondents to the survey were very evenly split between the sexes, with almost half to half (female 45%, male 55%). The third question focuses on the education level of the respondents (See Figure 2), with high school and below taking up 3%, secondary school and college taking up 12%, undergraduate taking up the most (i.e., 49%) and finally postgraduate and above taking up 35% of the respondents. Combining the results of the demographic-related content of the respondents in the above questionnaire reveals that, with little difference in gender, the majority of respondents are young and middle-aged people aged 26 and above with tertiary education and above.

The fourth and fifth questions focused on the position of the respondents (See Figure 3) and the number of years of experience (See Figure 4). According to the bar chart, middle management and above occupy the most at 40%, interns the least at 3%, first-line managers and laborial staff occupying the same index with 27%, respectively. In addition, 3% chose others and stated that they had previous work experience. Moreover, the largest range of years of experience for questionnaire respondents was 20+ years at 45%. This was followed by 11-20 years at 25% and 6-10 years at 16%. Fewer respondents had worked for less than 1 year and 1-5 years, accounting for 6%, and 9%, respectively. The majority of respondents had at least six years of working age. Nearly half of them have more than 20 years of service and are in middle management or above in their enterprises.

In the sixth question of the questionnaire (See Appendix 8.1), digital tools used in the workplace were presented in order to set the scene and provide ideas for the next few questions on personal perceptions of digital tools. In addition to the 28 digital tools mentioned by the respondents, there are also more than 20 digital tools that have been
spontaneously researched and used in their enterprises. The frequency with which the same content appears in respondents' answers shows that, despite the differences in enterprises, the digital tools commonly used in the Chinese workplace are OA systems, ERP systems, and Enterprise procurement platforms.

According to question 7 (See Figure 5), which shows how proficient respondents are in using digital tools. The proportion of respondents who stated they were “Quite proficient” or “Even proficient” was 43% and 34% respectively. The percentage of respondents who are “Very proficient” in the use of digital tools is 12% and the percentage who are “Not proficient” is 9%. Only a small number (2%) indicated they were “Inexpert” in digital tools, trying to avoid using them. The vast majority of respondents possess proficiency with digital tools. Respondents generally have a high level of competence in using digital tools.

Related question 8 (See Figure 6), shows the difficulty of individuals facing digital transformation. 33% of the respondents did not find it difficult. “Digital tools themselves are not easy to operate” and “Limited personal knowledge and ability” are at 36% and 29% respectively. This was followed by the high cost of learning to use it (14%) and a reluctance to change their current working situation (13%). As well as a small number of people who felt that the difficulty lay in the individual's reluctance to accept new things (6%). In the “Other” option, five respondents (3%) answered here. From the researchers' coding, some enterprises have not yet offered access to use digital tools; a lack of trust in the functionality of digital tools leads them not to use them in the workplace. At the same time, there are also multiple factors that respondents cited as reasons for not using digital tools. However, these factors were not specified by the respondents. The lack of ease of use of the digital tools themselves and limited personal knowledge and competence were the two most important factors that the employees interviewed found difficult.

The ninth question was about the factors that promote the personal use of digital tools (See Figure 7), with 78% of the respondents citing improved office efficiency, 48% being requested by the enterprise or leaders, 35% improving their own abilities, 20% being used by colleagues around them and 12% personal preference. In the “Others” option, 1% thought the promotion was to adopt the digital era. Digital tools that increase productivity
are clearly the most popular among employees. Personal empowerment encourages employees to choose to use digital tools in order to do so. In addition, mandatory requirements from leaders can also be effective in promoting the use of digital tools by employees.

Question ten is about the respondent's perceptions of digital tools (See Figure 8). In question 10.1, 6% of respondents expressed being intimidated, frustrated or exhausted by using digital tools. 31% of respondents said generally, as well as the majority of respondents disagreed (31%) and strongly disagreed (40%). In 10.2, most people (42%) showed they strongly disagree with the aversion to learning new digital skills and hearing about them at all. 38% showed they disagreed, 16% said they were average, and only 5% fit this category better. In 10.3, 47% showed they totally disagreed with boycotting and opposing the use of digital tools, 37% of respondents showed they disagreed, 13% showed they even, and 2% showed they agreed. In the first three sub-question of digital tools, no taking up on strongly agreed.

Continuing looking through Question ten, 10.4 about individuals looking for ways to discourage the use of digital tools, more than half (55%) indicated that they completely disagreed, 34% of respondents disagreed, 8% chose fair, 2% agreed, and 1% strongly agreed. In 10.5, 2% of respondents completely agreed that they did not know how to deal with problems with digital tools, 13% agreed, 28% said even, 30% disagreed and 27% completely disagreed with the statement. Combining all data in this question, the level of resistance to digital tools among the employees interviewed is low. In other words, employees mostly do not resist the use of digital tools at work. Furthermore, the technical operational problems faced in using digital tools can be a problem for employees.

Regarding question 11, which focuses on how digital leadership is perceived from a personal perspective (See Figure 9). This question is divided into 6 sub-questions presented in the survey. In 11.1, concerned leaders are well aware of the changes that the digital economy environment has brought to the organization, with 10% strongly agree, 26% agree, 43% even, 8% disagree and 2% completely disagree. In the next question about leaders having the expertise needed to understand digital transformation, the majority of respondents agree (36%) and even (43%). Additionally, 8% strongly agree,
10% disagree and 2% totally disagree. In 11.3, 8% of the respondents strongly agree that the leader has fully mastered the basic operation of the digital system of the organization, while 28% agree, and the majority (47%) think it is even. 17% disagreed with the statement and 1% strongly disagreed.

Regarding 11.4, 8% strongly agree that the training of relevant digital skills is sufficient to bring the skill level of leaders to the level required for management, 33% agree, and 45% even. Those who disagree and strongly disagree account for 14% and 1% respectively. In 11.5, fifteen percent strongly agree with their leaders that digital tools are very useful to their organizations, 52% agree, 29% even, 3% disagree, and 1% strongly disagree. In the last question of 11, leaders actively promote digital transformation in their enterprises, 14% strongly agree, 38% agree, 43% generally agree, 3% disagree, and 2% strongly disagree. A comprehensive analysis of the 11 question respondents' responses shows that employees believe that their leaders have advanced the digital transformation of the enterprise to some extent. They have a certain level of digital knowledge and skills, which is effective to some extent for the digitalization of the enterprise.

In question 12 (See Figure 10), the vast majority (61%) consider that the enterprise they work for is only moderately digitized, 23% of respondents consider that the enterprise is mostly digitized, 13% consider that the enterprise is only marginally digitized and only a minority of respondents consider that the enterprise is completely digitized (2%) or not digitized at all (1%). Moreover, question 13 (See Figure 11) shows how satisfied respondents are with the digitalization of their business, with more than average respondents (57%) indicating average, 24% satisfied, 5% very satisfied and 12% dissatisfied, and only 2% very dissatisfied. Which indicates general employee acceptance of the enterprise's digitalization.

The final question (See Figure 12) shows personal views on resistance to digital transformation, with the majority of respondents indicating general (32%) and disagreement (25%). 18% of respondents agree with resistance to digital transformation in the enterprise, 22% strongly disagree with resistance to digital transformation, and only a minority strongly agree (2%) with resistance to digital transformation. It is a direct
reflection of the attitude of the majority of employees who do not resist digital transformation.

4.2 Principal Component Analysis

In order to look at the correlation between the questionnaire questions and the questions, to observe whether they were measuring the same thing, and to compress the size of the data set, principal component analysis was first used (Abdi & Williams, 2010). The author coded the five sub-questions of the tenth question as V101 through V105 and the six sub-questions of the eleventh question as V111 through V116.

The Correlation Matrix Table for V101 to V105 (Table 4.2.1) presents the matrix of correlation between variables. It can be seen that the output between V101-V102, V101-V103, V102-V103, and V103-V104 are above 0.700, indicating that there are high correlations between these sub-questions. The correlation output between V101-V104, V101-V105, V102-V104, V102-V105, V103-V105 and V104-V105 is around 0.40 to 0.60. As a result, factor analysis is acceptable for these variables. Since the determinant is greater than 0.00001 (0.036 in this case), there is no multicollinearity or singularity between the variables. Overall, there is a correlation between V101 through V105. This five sub-question of the tenth question can be seen as a whole variable for the Linear regression test.
Table 2 Correlation matrix on Digital tools

KMO Table and Bartlett's Test presents the results of the Bartlett and KMO tests. It shows that Bartlett's test of Sphericity Chi-Square is 562.702, p<0.001, so the correlation matrix is significantly different from the same matrix. In this case, the variables do not correlate with each other and the variables are suitable for factorization. KMO index = 0.798, indicating that this group of variables is very suitable for factor analysis.

<table>
<thead>
<tr>
<th>KMO &amp; Bartlett Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaiser-Meyer-Oklin Measure of Sampling Adequacy</td>
</tr>
<tr>
<td>Bartlett's Test of Sphericity</td>
</tr>
<tr>
<td>Approximate of Chi-Square</td>
</tr>
<tr>
<td>df</td>
</tr>
<tr>
<td>Sig.</td>
</tr>
</tbody>
</table>

Table 3 KMO and Bartlett’s test on Digital tools

Table 4 Component Matrix on Digital tools

Sub-questions V111 through V116 of the eleventh question correlation Matrix output shown below (Table 4.2.3). The output between V111-V112 is 0.728, indicating that there is a high correlation between these two sub-questions. The correlation output between V112-V115 is 0.368, which shows that it is appropriate to do factor analysis, the correlation between the two sub-questions is not strong. The other correlation outputs are all around 0.40-0.70, indicating that it is appropriate to do factor analysis. Since the determinant is greater than 0.00001 (0.043 in this case), there is no multicollinearity or
singularity between the variables. Overall, there is a correlation between V111 through V116. This six sub-question of the eleventh question can be seen as a whole variable for the Linear regression test.

Table 5 Correlation matrix on Digital leadership

<table>
<thead>
<tr>
<th></th>
<th>V111</th>
<th>V112</th>
<th>V113</th>
<th>V114</th>
<th>V115</th>
<th>V116</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Correlation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V111</td>
<td>1.000</td>
<td>0.728</td>
<td>0.611</td>
<td>0.555</td>
<td>0.483</td>
<td>0.637</td>
</tr>
<tr>
<td>V112</td>
<td>0.728</td>
<td>1.000</td>
<td>0.584</td>
<td>0.622</td>
<td>0.368</td>
<td>0.518</td>
</tr>
<tr>
<td>V113</td>
<td>0.611</td>
<td>0.584</td>
<td>1.000</td>
<td>0.600</td>
<td>0.406</td>
<td>0.497</td>
</tr>
<tr>
<td>V114</td>
<td>0.555</td>
<td>0.622</td>
<td>0.600</td>
<td>1.000</td>
<td>0.465</td>
<td>0.583</td>
</tr>
<tr>
<td>V115</td>
<td>0.483</td>
<td>0.368</td>
<td>0.406</td>
<td>0.465</td>
<td>1.000</td>
<td>0.626</td>
</tr>
<tr>
<td>V116</td>
<td>0.637</td>
<td>0.518</td>
<td>0.497</td>
<td>0.583</td>
<td>0.626</td>
<td>1.000</td>
</tr>
<tr>
<td><strong>Sig. (1-tailed)</strong></td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

KMO Table and Bartlett's Test presents the results of the Bartlett and KMO tests. It shows that Bartlett's test of Sphericity Chi-Square is 530.968, p<0.001, so the correlation matrix is significantly different from the same matrix. In this case, the variables do not correlate with each other and the variables are suitable for factorization. KMO index = 0.843, indicating that this group of variables is very suitable for factor analysis.

Table 6 KMO and Bartlett's test on Digital leadership
4.3 Correlation——Spearman rho test

The correlation between structures was investigated using Spearman's rho test. There is a correlation and statistically significant if the p-value is less than 0.05 (i.e., typically ≤ 0.05). On the contrary, a p-value more than 0.05 (i.e., typically ≥ 0.05) is statistically non-correlated. This means that all other constructs show a relationship and that the results are statistically significant and valid. A total of 173 samples were analyzed for the Spearman correlation test. In Table 4.3.1, the correlation coefficient between employee perceptions of digital tools and employee resistance to digital transformation enterprises is 0.167*. This illustrates that the correlation between the two variables is 0.167* at a 0.05 significance level. Also, the output is positive, showing that there is a positive correlation between the employee perceptions of digital tools and employee resistance to digital transformation.

Table 4.3.2 shows the correlation between the employee perceptions of digital leadership and employee resistance to digital transformation enterprises is -0.125. The correlation coefficient output is negative. The p-value is 0.101 which is greater than 0.05, then the correlation test has been rejected. Therefore, there is no relationship between the employee perceptions of digital leadership and resistance to digital transformation enterprises.
4.4 Linear regression

The relationship between different two variables is examined utilizing linear regression. In order to validate the hypotheses for the linear regression analysis, SPSS was conducted. Based on Principle Component Analysis and Cronbach Alpha, the 4 hypotheses mentioned in the relationship between digital tools and resistance to digital transformation and the relationship between digital leadership and resistance to digital transformation are to be validated and reliable. Therefore, when using linear regression analysis, the four hypotheses were confirmed.

From the Model summary table, the regression equation could explain 3.5% of the total variation. This table also provides values for R and R square, with a value of R of 0.215 indicating a smaller correlation, and R square is 4.6%. R square represents the degree of explanation of the independent variables on the dependent variables. Its value range is
between 0 and 1. the larger the value, the stronger the explanation ability (DeCoster & Claypool, 2004). It indicates that 4.6 % of the total change in the dependent variable employee perceptions of digital tools and digital leadership can be explained by the independent variable resistance to digital transformation. Its small value indicates insufficient explanatory power of the variable. Thus, employee perceptions of digital leadership and digital technology have weak explanatory power for resistance to digital transformation, suggesting a weak correlation.

Moreover, based on the ANOVA table, the F-value is 4.104 and the significance level is 0.018 (i.e., 0.018 < 0.05). As the p-value is less than 0.05, there is thus insufficient evidence to reject the association of digital leadership and digital tools on employee resistance to digital transformation. The values show that the results are statistically significant, suggesting that the results may not have occurred by chance. The researchers therefore looked further into the coefficient of each variable.

In hypothesis 1 and 3, *the functionality of digital tools has a positive (or negative) effect on employees' resistance to digital transformation*. The information necessary to predict resistance to digital transformation based on employee perceptions of digital tools is provided in Table 4.4.3. The statistical contribution of employee perceptions of digital tools to the model is determined by looking at the significance level. Since the significance level is 0.029, and lower than 0.05, thus hypothesis 1 and hypothesis 3 are seen as preliminary supported. Furthermore, in the linear regression analysis of digital technology, it was found that the dependent variable equals 2.623 plus 0.051 independent variable based on the understandedized B-value, implying that for every unit increase in digital tools, the value of resistance to digital transformation increases by a corresponding 0.051. According to the linear regression equation illustrates that the dependent variable resistance to digital transformation is positively related to employee perceptions of digital tools. Moreover, combined with the results from the Spearman rho test, the researchers concluded that a positive correlation between digital tools and resistance to change. To sum up the above, hypothesis 1 is supported and hypothesis 3 is rejected.

In hypothesis 2 and 4, *employee perceptions of digital leadership have a positive (or negative) effect on their resistance to digital transformation*. Based on Table 4.4.3 below,
it shows a low t-value (-1.282) and a high significance level of 0.202 (0.202 > 0.05), which means there is no relationship between each other. Therefore, hypothesis 2 and hypothesis 4 were rejected. The employee perceptions of digital leadership have no significant effect on their resistance to digital transformation.

**Model Summary**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R square</th>
<th>Adjusted R Square</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.215a</td>
<td>0.046</td>
<td>0.035</td>
<td>1.078</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), digital tools, digital leadership
b. Dependent variable: Resist to DT of companies

*Table 10 Model Summary*

**ANOVA**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>9.535</td>
<td>2</td>
<td>4.767</td>
<td>4.104</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>197.471</td>
<td>170</td>
<td>1.162</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>207.006</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent variable: Resist to DT of companies
b. Predictors: (Constant), digital tools, digital leadership.

*Table 11 ANOVA*
<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Construct</th>
<th>t-value</th>
<th>significance level</th>
<th>beta</th>
<th>B</th>
<th>supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td></td>
<td>4.852</td>
<td>&lt; 0.001</td>
<td>2.623</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H1</td>
<td>Digital tools—resist to digital transformation</td>
<td>2.198</td>
<td>0.029</td>
<td>0.169</td>
<td>0.051</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>(positive)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H2</td>
<td>Digital leadership—resist to digital transformation</td>
<td>-1.282</td>
<td>0.202</td>
<td>-0.099</td>
<td>-0.027</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>(positive)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H3</td>
<td>Digital tools—resist to digital transformation</td>
<td>2.198</td>
<td>0.029</td>
<td>0.169</td>
<td>0.051</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>(negative)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H4</td>
<td>Digital leadership—resist to digital transformation</td>
<td>-1.282</td>
<td>0.202</td>
<td>-0.099</td>
<td>-0.027</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>(negative)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Table 12 Linear regression results*
5. Theoretical Discussion

5.1 Basic data

China has a high degree of digital transformation and is at the forefront of digital transformation development (Philip, 2021). The results illustrate that the enterprises where the employees are surveyed are basically digitized or in the process of digital transformation. Digitalization permeates the work of employees. The thesis further investigates digitization in China from the perspective of employees' use of digitization tools. The study found that China has a great variety of digital tools and that around 28 digital tools are commonly used in the workplace, such as OA systems, ERP systems, SCRM, WMS, etc. Another interviewee mentioned that the enterprise has independently developed more than 20 digital tools. These confirm the previous finding.

The research group for this thesis is roughly distributed between the ages of 35-55, with a majority of people with undergraduate and postgraduate education and above. The vast majority of them have a basic or even proficient command of digital tools, while just a small proportion of them are unfamiliar. In addition, the study found that digital tools enable facilitation (Nambisan Satish, 2017). The results found that the factors that employees choose to use digital tools include improving their self-skills and being asked to use them by their leaders. In particular, helping to increase productivity is the main reason for using digital tools. These confirm that the role of digital tools can increase the effectiveness through work, developing new forms of society as well (Xue et al., 2022). Whereas interactions between colleagues, personal inclination to use, and the need to be responsive to the times are likely to be influential factors, although they have not been confirmed. Failure to confirm Werth et al., (2020) previous research ideas for the personal influencing factors on digital transformation.

The findings, on the other hand, suggest that employees perceive that most of the challenges they face at work as a result of digitalization stem from both the difficulty of operating the digital tools themselves and their limited personal ability to use them. There are also employees who believe that the learning costs of learning to use digital tools are too high, such as spending a lot of time and paying extra fees. There are also employees who face the challenges posed by digitalization because they are not willing to change
their existing traditional working patterns. Nearly half of the study group has more than 20 years of work experience, as well as around a third of it has 6-20 years of work experience. A previous study suggests that compared to young employees, older employees are more likely to be resistant to digital transformation (Schulz, 2019). Consequently, they may be a factor in resisting digital transformation, while the relevance of it has not been examined further in this article.

In order to better test the proposed hypothesis, a direct question on the scale of employees' resistance to digital transformation was set to obtain an intuitive picture of employees' attitudes. The results of the study were that around 80% of those surveyed were not resistant or even supportive of digital transformation, which means the majority of employees are not resistant to digital transformation. However, such results did not perform to answer our research questions. Therefore, this thesis answers the research question by formulating a hypothesis and testing it. Since employees who have resistance are not in the majority, it is possible that it is one of the reasons for the low significant level of this thesis.

5.2 Digital technology

Digital technology has evolved over a long period of time and its development in the 21st century has gone through four main phases: shaping new technology enterprises and consumer behavior, using consumers as key players in the digital environment, user-generated content and development of digital technology. As a response to the demands of managers and customers, disruptive technologies have emerged (Diaz et al., 2021). It may well be that as digital technology has progressed over time, it has led to a gradual acceptance and habituation to its presence in people's lives.

Digital technology products are tools that help to increase productivity by reducing workload. The explosion of the Covid-19 pandemic has led to a fundamental shift in the way people live and work, with home working allowing more frequent access to and use of interactive project websites, mobile applications, web video conferencing and other means of communication (Horst et al., 2021). The explosion of the pandemic has accelerated the adoption of digital technologies, digital working, remote collaboration
and other methods that have had a lasting impact on the way enterprises operate. This has also led to a gradual transition from offline face-to-face offices to hybrid office models or even fully digital offices. An increasing acceptance of digital tools has driven the digital transformation of enterprises. This is also in line with the results obtained in this thesis.

After conducting the correlation analysis and linear regression analysis, the researchers confirmed Hypothesis 1 and rejected Hypothesis 3. The results reflected that the two variables have a positive relationship, indicating that when the employees have positive perceptions of the functionality of digital tools, they will have a positive attitude to resistance to digital transformation, and vice versa.

The development of digital technology has provided great opportunities for many enterprises to grow, whether it is public safety, healthcare, education, urban planning, or providing goods and services to consumers. These are really making people feel the convenience that digital technology brings to their lives (Satish, 2017). The combination of digitization and data-based processes has created new conditions for fundamental questions about corporate activities, social governance, and how people understand and view the world around them (Flyverbom et al., 2019). These good development opportunities make today's enterprises more willing to go through digital transformation as well.

At the same time, employees are confident enough to adapt to the new digital environment, driven by the belief that it will be beneficial from the new digital workplace and even likely to bring happiness to their work-life (Meske, 2021). Employees who are more receptive to digital tools also allow enterprises to complete their digital transformation better. This positive push is also in line with the results derived from this thesis that employee perceptions of digital tools have a positive influence on enterprise digital transformations.
Despite the various obstacles that digital transformation can bring, employees are still confident that they can adapt to the new environment since they believe that it will bring improvement to their work-life.

5.3 Digital leadership

Digital transformation is an effective obstacle, which also could be seen as a leadership opportunity (Sunarsi & Erlangga, 2020). Digital leaders are distinguished from other leaders by their ability to clearly plan a digital transformation strategy for the business and to drive the transformation of the business from an individual to a holistic one (Magesa & Jonathan, 2021). Not only does digital leadership play a significant role in the success of digital transformation (Abbu et al., 2022), the role of employees is also highlighted in digital transformation (Cetindamar et al., 2021). According to previous studies, Kane et al. (2019) emphasized the role of digital leadership and pointed out that digital transformation is the result of the interaction between leaders and employees. And digitally mature enterprises tend to have strong digital leadership that leads the enterprise through the digital transformation from top to bottom (Araujo et al., 2021).

In the process of corporate change, leaders have an obligation to maintain a positive working atmosphere, motivate employees to be loyal to the enterprise and encourage change to be driven together (Winasis et al., 2021). Moreover, under the digital background, the degree of influence of leadership is related to the effectiveness and engagement of employees in the enterprise (Fitaloka et al., 2020). In other words, in the process of digital transformation, whether employees actively participate in or resist is related to leadership. In summary, it is evident from previous literature that digital leadership and the role of employees in digital transformation are related. However, the findings were not validated in this study.

There are two hypotheses about digital leadership, neither of which is supported according to the results. Hypothesis 2 and 4 could not be confirmed because of the high significance scores in the correlation and linear regression analysis. Based on the results, it was surprising that there is no relationship between these two variables. Therefore, in this study, the researchers conclude that the hypothesis that digital leadership is associated
with employee resistance to digital transformation in the Chinese business market is not supported.

The possibility leading to the results is the study market is located in China, which leads to biased conclusions given the uniqueness of the market. China is a country with a high power distance index of 80 (Hofstede, 2020), which means that relationships between superiors and subordinates are highly polarized (Daniels & Greguras, 2014). As a result, employees rarely resist tasks assigned to them by their superiors. The survey's findings revealed that the respondents' perceptions of leadership are mostly positive or neutral, which the researchers believe is one of the reasons for the rejection of the results of the linear analysis regarding hypotheses 2 and 4. There are some other factors that may have an effect on the results, such as culture, personalities, enterprise type, etc. These factors have not been researched in this thesis, while they could be researched in future studies.
6. Conclusion and discussion

6.1 Summary

The major goal of this research is to investigate the resistance to digital transformation from the perspective of employees. Digital tools and digital leadership were highlighted as two aspects of the research theme to be explored. An online survey was used to obtain primary data to answer the following research question: ‘How do employee perceptions influence resistance towards the digital transformation in China?’ In addition to this, theoretical frameworks were created to analyze the results of the survey and to further explore the role that digital tools and digital leadership play in resisting digital transformation in organizations.

As a result of the findings, the study proposed that employee perceptions of digital technology were positively associated with resistance to digital transformation. When employees are more receptive or skilled in the use of digital technology, there is a positive attitude towards digital transformation and thus less resistance. In addition, the researchers argue that the limitations of the research market, power distance, culture, enterprise types, and other factors influence the relationship between employee perceptions of digital leadership and resistance to digital transformation. Therefore, in this study based on the business environment in China, it is outlined that when employees have positive perceptions of digital technology, it helps to drive digital transformation in the enterprise. On the other hand, the relationship between employee perceptions of digital leadership and resistance to digital transformation is refuted.

6.2 Implication

The theoretical contribution of this thesis is to provide a new perspective to the study of digital transformation in enterprises, focusing on the resistance of employee perceptions of digital transformation. Through the findings, resistance to digital transformation is positively related to employee perceptions towards digital technologies. It is concluded that resistance to digital transformation is not related to digital leadership. Due to the low significance, the impact of digital tools on an enterprise's digital transformation can be seen as minimal. This rejects the findings of previous scholars who argue that digital
technology and digital leadership have a significant impact on digital transformation (Foroudi et al., 2017; Eva & Francesco, 2021).

The practical implications of this thesis are that it provides some potentially useful ideas for managers of enterprises when operating work on digital transformation. Most employees have the ability to be familiar with using digital tools. The findings of the study reveal that managers can make a more nuanced choice of digital tools adopted by their enterprises as well. More consideration should be given to the operability, functionality and efficiency of the digital tools in order to make them more acceptable to employees. Thus reducing resistance and facilitating the full coverage of the digital transformation in the enterprise. In addition, managers could provide training to employees on the digital tools adopted by the enterprise. Previous research proved that employee satisfaction is a very important factor for the enterprise's progress in completing its work (Nielsen & Randall, 2012). The results of the study found that employee resistance was associated with difficulties in learning new digital tools. Providing professional training by the enterprise will be effective in alleviating these difficulties and mitigating resistance.

6.3 Limitation

The thesis has several limitations regarding research content and data methods. The study results reported that in the Chinese business environment, employees rarely resist the digital transformation of enterprises. The negative emotions caused by cynicism, job satisfaction, job status and other reasons to resist the digital transformation of enterprises have not been further verified. This thesis adopts a quantitative approach and future research can complement the qualitative approach for further study. By reading other research literature, the researchers found that the factors that impact an enterprise's digital transformation are mainly employee perceptions of digital tools and digital leadership. Therefore, this thesis only investigated the impact of digital transformation from these two points without considering the impact of other influencing factors on the digital transformation of enterprises, such as workers' perceptions of work-life balance, wages and welfare, etc.
Moreover, the sample size for the study was only 254 overall in one week due to funding and the short time frame for collecting the survey sample. This resulted in the 254 sample size collected being insufficient to gather a comprehensive understanding of employee perceptions of digital tools and digital leadership in all digitally transformed enterprises in China. At the same time, the scope of respondents was limited by the fact that the survey used the snowball method. In addition, this survey does not classify the types of enterprises, which makes the applicability of this thesis's research to different types of enterprises unclear.

The scope of this thesis is limited to the Chinese region, and due to cultural differences, the usefulness of the findings of this study for other countries and regions is yet to be investigated. For example, most Chinese enterprises have power distance, Chinese culture focuses on the idea of collectivism, and euphemisms for problematic findings can make the results of the collected sample unremarkable. Finally, the sample was collected and surveyed during the Covid-19 pandemic in China. Due to rapid digital development, the results of the study may be different from those presented in this thesis if the same sample data are collected again after the pandemic.

6.4 Future study

This study contributes to the digital transformation of enterprises. However, because the topic of this study is relatively new, this article provides some directions for future research. Firstly, employee perceptions can be all-encompassing. This study examines two factors from employee perceptions, which are digital tools and digital leadership on the impact of digital transformation in enterprises. While employee perceptions are multi-faced, which is an important part of what enterprises need to know during their digital transformation. Therefore, future research could also follow up on employee perceptions not included in this study, such as work-life balance, compensation and benefits, leadership perceptions, organizational stability, etc.

Moreover, as resistance was not prominent in the study data results, future research could also further examine the impact of stronger resistance on digital transformation. It could
also test whether cynicism, job satisfaction, job status are resistance factors to digital transformation in enterprises.

Secondly, the survey's perceptions of digital tools and digital leadership may also vary by age. The age group surveyed in this study is mainly 26-55 years old, most of whom have a longer work experience, while only 13 samples have been collected from the age group 18-25 years old, who have just entered the workforce from school. In the future, there will be younger groups entering the work environment, growing up in the digital age, and in future research the attitudes of younger staff resisting digital transformation could be investigated based on the arguments in this study.

Lastly, according to the findings of this thesis, employee perceptions of digital tools were found to have a positive effect on digital transformation. In contrast, employee perceptions of digital leadership had no effect on digital transformation. Further research could build on this finding. Furthermore, future research could go further and investigate the impact of digital tools and digital leadership on the digital transformation of employees in different countries and regions. For example, the Americas and Europe regions mentioned in this study, where the world is also highly digitalized. As well, employees' attitudes towards digital transformation are influenced by differences in values, work habits, communication styles, social systems, Etc., which future research could further explore.
7. Reference


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8. Appendix

8.1 Survey Items

1. Your age [Single-choice] *
   ○ 18-25
   ○ 26-35
   ○ 36-45
   ○ 46-55
   ○ over 55

2. Your gender: [Single-choice] *
   ○ Male
   ○ Female

3. Your education level [Single-choice] *
   ○ High school and below
   ○ Post-secondary and college
   ○ Bachelor
   ○ Postgraduate and above

4. Your position is [Single-choice] *
o Middle management and above

o First-line management

o Laborial staff

o Internal

o Others ____________________ *

5. Your working years  [Single-choice] *

o Below 1 year

o 1-5 year

o 6-10 year

o 11-20 year

o More than 20 year

6. In your workplace, you currently use the following digital tools/systems: [Fill-in-the-blank questions] *

(such as OA system, distance education platform, industrial Internet Saas platform, ERP, SCRM, online channel, artificial intelligence etc.)

________________________________________

7. How proficient are you in using the digital tools mentioned above  [Single-choice] *

o Very proficient
8. How difficult it is for you to use digital tools in your work scenario: [Multiple Choice]*

☐ The digital tool itself is difficult to operate
☐ High learning cost of using it.
☐ Limited personal knowledge and ability
☐ Unwilling to accept new things
☐ Unwilling to change the current work status
☐ Other ________________*
☐ No difficulty in using digital tools

9. What factors do you think motivate you to use digital tools: [Multiple Choice]*

☐ The enterprise or the leader requires it.
☐ Colleagues around you are using it.
☐ Personal Preference.
☐ Improving your own capability.
☐ Improve work efficiency
10. Your opinion on the use of digital tools in your work environment: [Matrix Single-Choice question] *

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Normal</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I am intimidated, frustrated or exhausted by using digital tools</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>2</td>
<td>I am sick of learning new digital skills and hearing about new digital skills</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>3</td>
<td>I resist and oppose the use of digital tools</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>4</td>
<td>I will look for methods to stop the use of digital tools</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>5</td>
<td>I don't know how to deal with the problems that arise with digital tools</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
11. Please evaluate whether the following statements are realistic in relation to your perceived competence in digital leadership in the workplace [Matrix radio question] *

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Normal</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1）My leader is well aware of the changes that the digital economy environment is bringing to organizations</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>2）My leader has the expertise necessary to understand digital transformation</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>3）My leader has fully mastered the basic operation of the organization's digital system</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>4）Training in digital skills is sufficient to bring the skill level of my leaders up to the level required for management</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
5) My leader finds digital tools very helpful to the organization

6) My leader is actively driving digital transformation in the sector

12. What level of digital development do you think the enterprise you currently work for is? [Single-choice] *

No digitalisation at all  ○1  ○2  ○3  ○4  ○5  Fully digital

13. Your opinion on the level of digitisation of the enterprise you work for [Single-choice] *

Unsatisfied  ○1  ○2  ○3  ○4  ○5  Satisfied


Strongly disagree  ○1  ○2  ○3  ○4  ○5  Strongly agree

8.2 Survey Results
Figure 1. Age & Gender

Figure 2. Education level
Figure 3. Position

Figure 4. Working Age
Figure 5. Proficiency with digital tools

Figure 6. Difficult for using
Figure 7. Motivated factors

Figure 8. Opinion on the use of digital tools
Figure 9. Perceptions on digital leadership

Figure 10. Level of digital development of the current workplace
Figure 11. Opinion on current workplace digitized environment

Figure 12. Business Mode