


The Duality Determinants of Adoption Intention in Digital Transformation Implementation

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ABSTRACT

The COVID-19 pandemic has accelerated the trend of digital transformation (DT) among businesses. DT redefines business models, which significantly changes employees' work practices. If employees lack an appropriate mindset for DT, it can result in DT failure. However, little research has explored the intention of employees to embrace DT. This study proposes a dilemmatic dual-factor research model to examine the factors influencing employees' acceptance of DT, including management support and resistance to change in the outer/explicit aspect and perceived benefits and inertia in the inner/tacit aspect. The study found that the perceived benefits of DT positively impact employees' intention to accept DT, but resistance to change and perceived inertia are significant barriers. Moreover, management support alone is insufficient to encourage employees to accept DT. This study is distinct from prior research, which typically focuses on successfully implementing DT from the firm's perspective. Instead, the study offers valuable insights into promoting employee acceptance of DT.

KEYWORDS

Adoption Intention, Digital Transformation, Dilemmatic Dual-Factor Perspective, Employee Perception, Initial Adoption

INTRODUCTION

In today's business environment, advanced digital technologies such as cloud computing, the Internet of Things, blockchain, and big data analytics are widely utilized in business processes and have produced significant changes in economics and society, leading to the trend of digital transformation (DT) (Nambisan et al., 2017; Vial, 2019). The coronavirus disease 2019 (COVID-19) pandemic has further accelerated the development and progress of DT in several firms. The International Data Corporation (IDC) states that the COVID-19 pandemic has highlighted the value of DT, suggesting that firms turn this crisis into an opportunity to expedite their transformation (IDC, 2021, 2022). Most researchers and practitioners acknowledge that DT can help firms develop their digital capability and

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enhance their competitive advantage in the contemporary world (Verhoef et al., 2021; Vial, 2019; Wessel et al., 2021).

Researchers are paying more attention to these developments as the ubiquity and visible effects of DT and resultant new digital business models become increasingly evident. Researchers from different business disciplines have focused on reviewing and defining the DT phenomenon (Verhoef et al., 2021; Vial, 2019; Wessel et al., 2021). Recent studies have found that DT reflects a firm's ability to employ digital technologies to develop new business models and enhance business outcomes (Karagiannaki et al., 2017; Verhoef et al., 2021; Wessel et al., 2021; Westerman et al., 2014). DT, thus, is considered a powerful force that can fundamentally alter how firms conduct their business and the roles employees play in the work context (Wessel et al., 2021). In other words, DT can (re) define a firm's value proposition and create a new organizational identity (Wessel et al., 2021).

However, business remaking during DT often leads to significant changes in the micro-level work and work practices in which the firm's employees engage, rather than just changes in digital or information technology (IT) infrastructure (Tabrizi et al., 2019; Wessel et al., 2021). Therefore, the firm's top management generally asks its employees to engage in new work practices to align with the new value proposition. If not attended to, this may derail the entire DT (Wessel et al., 2021). Previous studies have suggested that employees often refuse to adopt new work practices due to inertia (Polites & Karahanna, 2012). Furthermore, some employees may perceive DT as threatening their jobs and consciously or unconsciously resist the changes (Tabrizi et al., 2019). If employees lack the right mindset to change and current work practices are flawed, DT will significantly magnify these flaws (Tabrizi et al., 2019). Therefore, how employees react to such changes remains a critical issue and is key to successfully implementing DT.

However, prior studies on DT have primarily focused on defining and reviewing the phenomenon (Kraus et al., 2022; Verhoef et al., 2021; Vial, 2019; Wessel et al., 2021), or on exploring the determinants of DT from the firm perspective (Akhtar et al., 2022; AlNuaimi et al., 2022; Ciampi et al., 2022; Davison et al., 2023; El Sawy et al., 2020; Ghobakhloo & Iranmanesh, 2021; Porffirio et al., 2021; Singh & Hess, 2020; Ta & Lin, 2023). Few studies have examined the determinants driving employees to accept DT and new digitalized work practices (Vial, 2019; Wessel et al., 2021). This is a significant gap in the literature, as understanding these determinants is essential for ensuring the successful implementation of DT initiatives. Thus, this study addresses this gap by investigating the facilitators and hindrances employees face during DT implementation. We adopt a dilemmatic dual-factor perspective (Turel, 2015), considering both the outer/explicit and inner/tacit influences on employees' perceptions of DT. We argue that these dual factors can push and pull employees towards or away from DT and that the study of these factors is essential for driving employees to adopt DT.

Specifically, from the outer/explicit aspect of the employee's view, management support for the changes brought about by DT often leads employees to be more willing to accept new digital technologies and work practices (Bala & Venkatesh, 2016). However, prior research has also indicated that employees often explicitly resist organizational changes like DT (Ali et al., 2016; Kim & Kankanhalli, 2009). This is because the changes caused by DT often make employees perceive a threat to their routine work (Tabrizi et al., 2019). Accordingly, management support and resistance to change can be considered dilemmatic outer/explicit facilitators and hindrances that affect employees' intention to accept DT. From the inner/tacit aspect of the employee's view, a significant facilitator is that DT and a new work practice can provide employee benefits (Jimenez-Martinez & Polo-Redondo, 2004). Nevertheless, employees may also perceive that they are unfamiliar with DT and the new work practice, creating internal inertia and causing them to refuse DT. Inertia represents the practices employees are accustomed to from their previous jobs (Polites & Karahanna, 2012). Thus, perceived benefits and perceived inertia can be considered dilemmatic inner facilitators and hindrances that affect employees' intention to accept DT.

Previous studies have explored user behaviors and intentions using adoption models or push-pull-mooring models. The former aims to understand the reasons behind individuals' acceptance or rejection

of IT or information system (IS), shedding light on the adoption process and influential factors. The latter proposes push, pull, and mooring factors to uncover motivations and considerations that shape user behaviors and choices regarding IT/IS. However, our dilemmatic dual-factor model recognizes that user behavior and intention are influenced by a combination of two opposing considerations, emphasizing that decision-making includes weighting and reconciling conflicting determinants. The idea is more appropriate than the two models in our research context because employees must evaluate the pros and cons of DT for themselves. While they are motivated to enhance their work performance, they are also hesitant to disrupt their existing routines excessively. Hence, our proposed model acknowledges and highlights the inherent tension and trade-offs between competing factors, a more comprehensive framework for addressing our research issue.

Overall, our study provides several contributions to the literature on DT. First, a scarcity of research focuses on the employee's perspective to apprehend their reactions and mindset toward embracing DT (Vial, 2019; Wessel et al., 2021). Our study directly addresses this knowledge gap. The perspective of the employee is critical as DT typically involves significant changes at the micro-level of work and work practices (Verhoef et al., 2021; Vial, 2019; Wessel et al., 2021). Second, we present a comprehensive overview of the facilitators and hindrances (from outer/explicit and inner/tacit aspects) that employees confront during the DT implementation process. By using the dilemmatic dual-factor idea, this study offers a more nuanced understanding of these factors. Third, we offer several practical recommendations for firms that are considering DT implementation. They are based on our findings and the experiences of other organizations which have successfully implemented DT initiatives. Finally, we respond to calls for more DT empirical studies (Kraus et al., 2022; Nadkarni & Prügl, 2021; Verhoef et al., 2021).

The remainder of this paper is organized as follows. After reviewing literature on the dilemmatic dual-factor perspective, DT, and the major research constructs, we propose our research model and hypotheses and describe our research methods and measurements. We then present the data analysis and results and, finally, share our research conclusions, implications, future research directions, and limitations.

LITERATURE REVIEW

Theoretical Foundation

We adopt the dilemmatic dual-factor perspective to explain how outer/explicit and inner/tacit factors facilitate or hinder an employee's intention to adopt DT (Turel, 2015; Turel et al., 2013; Turel & Zhang, 2011). The core idea of this perspective is that individuals often face a dilemma of whether to accept or resist an objective (Turel, 2015; Turel et al., 2013; Turel & Zhang, 2011). These apparent opposing decisions can coexist and are relevant to explaining people's mental state (Turel, 2015). Previous studies have shown that IT/IS acceptance/adoption and resistance/avoidance can exist independently and are not entirely negatively correlated (Liang & Xue, 2009; Van Offenbeek et al., 2013). Turel (2015) further argued that seemingly opposing ideas are not always poles on a continuum but can coexist and may have different predictors and outcomes. As a new behavioral attitude aligns with an existing attitude, the new attitude does not always replace the existing one but instead creates a dual-attitude concept. For example, in human interactions, those interacting may reflect each other's feelings and form new attitudes about the relationship. This new mindset, such as ending the relationship, does not totally replace the previous one right away (Ajzen, 2001). Cenfetelli (2004) debated dual-factored concepts and revealed that inhibiting and enabling perceptions of technology use are distinct from each other, independent, but can coexist.

In this study, we apply the concept of duality of attitudes in initial adoption to investigate employees' acceptance intention of DT. Since the brain can comprehend two opposing opinions simultaneously and independently, the dilemmatic dual-factor approach to positive and negative phenomena is more accurate than considering acceptance and non-acceptance of DT as opposite

extremes on a continuum (Cacioppo & Berntson, 1994). Furthermore, opposing intents and actions, such as trust/distrust (Kramer, 1999) or job satisfaction/dissatisfaction (Herzberg, 1966), may be associated with different factors. Thus, non-acceptance intentions may be driven by different factors than those driving acceptance intentions, leading to different behaviors. This duality of attitude and consequent conflicting intentions are more significant in situations where the behavior appears to be problematic (e.g., accepting DT and new work practice) (Cacioppo & Berntson, 1994). In such cases, people's intentions are usually formed to meet their current needs, even though the balance between the behavior in the issue and the intentions of what individuals believe they should do is also considered (Wyma, 2004). Therefore, this study considers the employee's perspective to understand their situation in the firm. Employees typically face influence from both the outer/explicit aspect (e.g., the firm) and the inner/tacit aspect (e.g., the employee's individual perception). We argue that both aspects have dilemmatic dual factors that influence how the employee perceives DT. Specifically, we propose the opposite outer/explicit facilitator and hindrance, namely management support and resistance to change, as well as the opposite inner/tacit facilitator and hindrance, namely perceived inertia and perceived direct and indirect benefits.

Digital Transformation

Over the last two decades, firms in various sectors have started exploring how new digital technologies can transform their business models to gain an edge over their competitors (Davison et al., 2023; Fitzgerald et al., 2014; Kohli & Melville, 2019). These digital technologies include cloud computing, the Internet of Things (IoT), blockchain, big data analytics, and so on (Nambisan et al., 2017; Vial, 2019). In recent years, the business models of many firms have become intertwined with digital technologies, leading to radical changes in their work practices, structures, products, and services (Davison et al., 2023; Wessel et al., 2021). As a result, DT has become a well-known concept worldwide.

Researchers have attempted to explore and define what DT is and is not (Wessel et al., 2021). In early studies, DT was defined as using technology to fundamentally enhance enterprise performance (Karagiannaki et al., 2017; Westerman et al., 2014; Westerman et al., 2011). Recently, Vial (2019) proposed a clearer definition of DT as “a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computation, communication, and connectivity technologies” (p. 121). This definition implies that a firm with DT needs to radically transform its operational processes and business models to provide higher value to customers and meet changing market demands. Wessel et al. (2021) further articulated that DT involves two critical elements. First, DT (re)defines a firm's value proposition, and second, DT is characterized by the emergence of a new organizational identity.

While DT fundamentally changes business models and value propositions from the firm's perspective, it also radically changes micro-level work and work practices from the employee's viewpoint. Recent DT studies have focused on reviewing the literature and the boundaries of DT (Kraus et al., 2022; Nambisan et al., 2017; Verhoef et al., 2021; Vial, 2019; Wessel et al., 2021). Some studies have focused on driving DT from the firm's perspective (AlNuaimi et al., 2022; Ghobakhloo & Iranmanesh, 2021; Porfirio et al., 2021; Ta & Lin, 2023). For example, AlNuaimi et al. (2022) proposed that digital transformational leadership can lead to DT through organizational agility and that digital strategy can prompt the effects of digital transformational leadership and organizational agility on DT. However, fewer studies argue from the employee's viewpoint to determine how to drive employees to accept DT and new digitalized work practices. Hence, based on the dilemmatic dual-factor perspective and the literature related to DT, this study identifies critical factors that affect employees' intentions to embrace DT. These factors are classified into outer/explicit and inner/tacit facilitators and inhibitors. We identify two dilemmatic factors from the outer/explicit aspect—management support and resistance to change—and three dilemmatic factors—perceived inertia,

perceived direct benefits, and perceived indirect benefits from the inner/tacit aspect. We discuss each factor in the following subsections.

Management Support

Management support is widely recognized as a key facilitator that affects employees' adoption of technologies in firms, as evidenced by previous research (Agarwel, 2000; Sharma & Yetton, 2003; Thong et al., 1996). This study defines management support as the degree to which employees think that management is engaged to the implementation of DT in the firm (Sharma & Yetton, 2003). The crucial role of management in successful digital technology implementation is well-documented (Bala & Venkatesh, 2016; Kim & Kankanhalli, 2009; Wang et al., 2006), and this study posits that management support remains critical in the context of DT due to its potential to significantly impact business models and work practices (Vial, 2019; Wessel et al., 2021). To effect changes in work practices, it is essential to influence employees' attitudes and behaviors. Research suggests employees are more willing to try new digital work practices when management provides emotional and behavioral support (Bala & Venkatesh, 2016). Moreover, employees are more likely to perceive opportunities for career advancement or rewards when they believe that management supports and conveys benefits to them at work (Bala & Venkatesh, 2016). Therefore, management support is crucial in shaping employees' psychological thoughts and behaviors toward accepting DT.

Resistance to Change

Resistance to change means that employees have an adverse reaction or an intentional act to defy management and changes related to a new practice (Ali et al., 2016; Kim & Kankanhalli, 2009). This study defines resistance to change as the employee's intentional acts to defy DT (Ali et al., 2016). We consider resistance to change as one of the most important of an employee's outer and explicit hindrance because it manifests as an outward and reluctant reaction exhibited by employees in response to management support. As a certain number of employees exhibit resistant reactions, this may further lead to an increased prevalence of similar reactions conducted within the broader employee cohort (Ali et al., 2016; Kim & Kankanhalli, 2009). Resistance to change also reflects that employees attempt to maintain the status quo when they face pressure to change (Ali et al., 2016). In fact, resistance to change is employees' on-going behaviors and situations, perceived as a negative or stressful feeling (Ali et al., 2016). Such a feeling is likely to lead employees to refuse to embrace DT. Of course, prior studies have demonstrated that resistance to change is a critical negative factor when implementing new digital technologies (Ali et al., 2016; Kim & Kankanhalli, 2009; Lapointe & Rivard, 2005). Hence, it is crucial to help employees understand the value of DT and to reduce their anxiety to minimize resistance (Kim & Kankanhalli, 2009; Ragu-Nathan et al., 2008; Venkatesh & Bala, 2008). However, resistance to change remains a significant issue during DT implementation due to the comprehensive changes in work practices it entails (Vial, 2019; Wessel et al., 2021). Due to unconscious attitudes and insufficient knowledge, employees may find it challenging to respond effectively to new job tasks with new digital work practices (Venkatesh & Bala, 2008). As a result, resistance to change may offset employees' positive intentions towards DT.

Perceived Inertia

Perceived inertia refers to the tendency to stay and continue on a current path of action even when there are better possibilities and incentives to change, due to a lack of motivation or a strong emotional attachment to the old way of doing things (Polites & Karahanna, 2012). This phenomenon can explain employees' habituation to old practices, despite knowing that they may not be the most efficient or effective method of completing a task (Prakash & Das, 2021). In this study, perceived inertia reflects an individual's attitude that the implementation of DT may yield uncertain or negative results, which may lead to a conscious unwillingness to accept it.

Furthermore, although perceived inertia and resistance to change may appear to be similar phenomena, they are fundamentally distinct in their underlying nature and implications. Resistance to change involves active or passive reactions that hinder the implementation of DT. Conversely, perceived inertia is a cognitive construct that represents an employee's attitudes or perceptions regarding their inability or unwillingness to change and is not a reaction to DT but rather an overarching mindset. As such, we consider perceived inertia to be an important hindrance from an employee's inner/tacit perspective.

Perceived Direct Benefits

In marketing research, perceived benefits are widely used to capture the positive relationship between customers and a product/service. During the purchasing process, customers typically have expectations based on their positive perception of the product/service, which is referred to as perceived benefit (Monroe & Krishnan, 1985). In management information systems (MIS), prior studies have demonstrated that perceived benefits can positively impact users' intentions to employ diverse information technologies, such as mobile payments (Liu et al., 2012). In this study, we further divide perceived benefits into perceived direct and indirect benefits. Perceived direct benefits refer to the advantages employees immediately experience while adopting DT at work. The direct benefits of DT generally reflect the benefits that are easiest to identify and measure; they are easily understood by everyone and are also the first to be experienced. For example, using the technology of electronic data interchange can significantly improve the efficiency of information exchange and reduce the time spent processing documents (Jimenez-Martinez & Polo-Redondo, 2004; Kuan & Chau, 2001; Lee & Wang, 2016). Accordingly, the direct advantages of DT from the employee's perspective can be the improvement of their individual task efficiency or reduction in clerical mistakes.

Perceived Indirect Benefits

We further define perceived indirect benefits as the extent to which employees perceive that their firms obtain better competitive advantages when adopting DT. In contrast to perceived direct benefits, perceived indirect benefits are less tangible and unrelated to employees' work practices. Indirect benefits are often associated with better organizational efficiency within cooperation and collaboration with suppliers and customers (Verhoef et al., 2021; Vial, 2019; Wessel et al., 2021). In other words, perceived indirect benefits are the ways in which a firm can alter its commercial methods and business strategies to stay ahead of its competitors (Jimenez-Martinez & Polo-Redondo, 2004). Accordingly, perceived indirect benefits mainly refer to the firm's employees recognizing the strategic and competitive advantages brought by DT (Kuan & Chau, 2001).

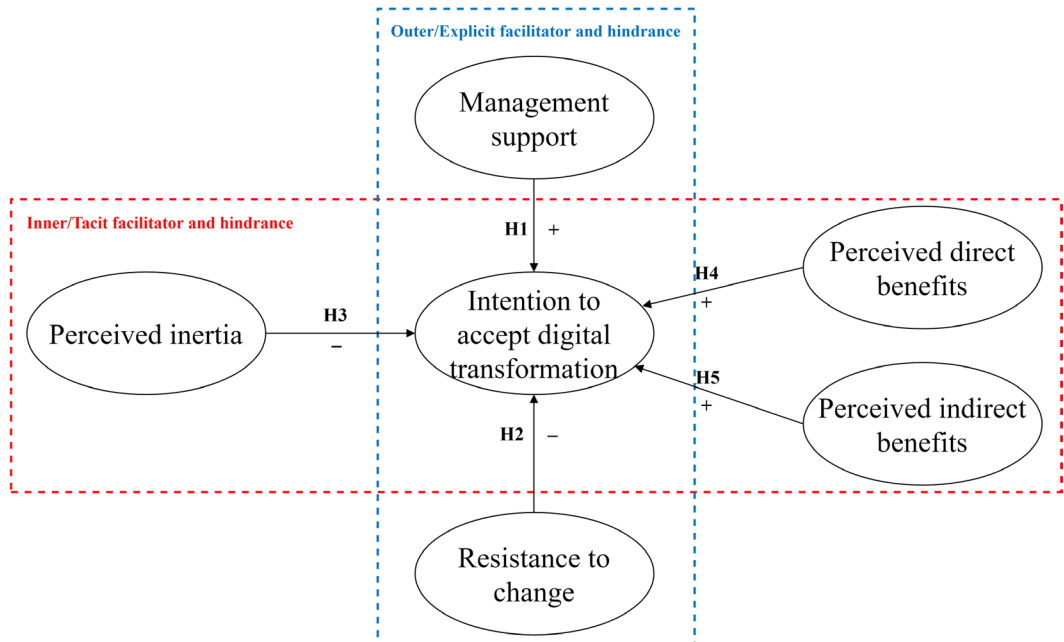
RESEARCH MODEL AND HYPOTHESES

This study develops a research model based on the dilemmatic dual-factor perspective from the employee's point of view. Specifically, we propose the drivers of the employee's intention to accept DT from its outer/explicit and inner/tacit aspects. For the former, management support and resistance to change are dilemmatic facilitators and hindrances, respectively. For the latter, perceived inertia and perceived direct and indirect benefits are dilemmatic facilitators and hindrances that influence the employee's intention to accept DT. The research model is depicted in Figure 1, and research hypotheses will be developed in the following subsections.

Hypotheses From the Outer/Explicit Aspect of the Employee's View

In general, management has a greater capacity and social status to influence employees' intentions, behaviors, and resource allocation within the firm. Viewing this from a psychological safety perspective (Edmondson, 1999), management support acts as a psychological engagement method, helping

Figure 1. Research model



employees to develop a sense of psychological safety and structural assurance. Specifically, with strong support from management for DT, employees may see embracing new digital work practices as an opportunity to gain rewards and promotions (Bala & Venkatesh, 2016). As management becomes more involved in DT, employees will feel a sense of psychological well-being and be more willing to try new digital technologies and practices in their working environment. Moreover, the perception of management support can further give employees the feeling that they are free to use the different functions of digital technologies to get their jobs done (Bala & Venkatesh, 2016). Although prior studies have demonstrated that management support is effective in promoting the adoption of information technology with new work models, DT involves more essential and comprehensive changes in the micro-level works and work practices, which may make management support play a more crucial role in overcoming potential obstacles. Therefore, we posit the following hypothesis:

H1: Management support is positively associated with the intention to accept DT at work.

As mentioned earlier, DT is the process of integrating digital technologies with a current business model, which often creates significant resistance to DT (Vial, 2019). For instance, we can take enterprise resource planning (ERP) as an example of DT. Implementing an ERP system requires the adopting firm to implement a best practice (Lee & Chang, 2020; Wang et al., 2006), leading to a change in the extant organizational identity. Major business processes, such as procurement, material management, manufacturing, sales, financial accounting, and strategic planning, will likely be fundamentally altered (Klaus et al., 2000). Employees' perception of the complexity of ERP further exacerbates their emotional responses to organizational change, increasing resistance to accepting ERP implementation (Freeze & Schmidt, 2015). Like ERP implementation, DT often faces resistance, which may be more significant since the influence of DT on the firm is more comprehensive and fundamental (Vial, 2019; Wessel et al., 2021). This is because employees often prefer to maintain their current status or situation based on the perspective of status quo bias (Kim & Kankanhalli, 2009;

Samuelson & Zeckhauser, 1988). Employees may thus negatively react to new digital technologies and practices since their cognitive misperception and psychological commitment may lead them to wonder whether the new practices would be complex (Samuelson & Zeckhauser, 1988). They would perceive that their skills related to the previous practices will be lost as a result of successful DT. Such awareness of losses will likely increase their negative reactions, reducing employees' intention to embrace DT. Thus, we posit the following hypothesis:

H2: Resistance to change is negatively associated with the intention to accept DT at work.

Hypotheses From the Inner/Tacit Aspect of the Employee's View

Prakash and Das (2021) argued that when a firm introduces a new work practice, employees often feel pressure to change their work practices. This often results in a strong emotional connection to their current practices, as in the status quo bias perspective suggested by Samuelson and Zeckhauser (1988). This bias may cause employees to prefer adhering to their incumbent practices, even when they recognize that these are not the most effective or efficient way to accomplish tasks (Polites & Karahanna, 2012). In addition, incumbent practices can also be considered as many interlocking individual-level habit sequences (Becker, 2004). When engaging in habitual practices automatically, employees will not reevaluate those habits and the context. Instead, they will simply continue with their existing habitual practices (Polites & Karahanna, 2012). Thus, when DT initiators mention that DT can reshape work practices, employees generally ignore that because they tend to continue their existing work practices. Therefore, inertia may offset the enabler of DT and create a negative influence on the acceptance of DT. Consequently, we propose the following hypothesis:

H3: Perceived inertia is negatively associated with the intention to accept DT at work.

Fischhoff et al. (1978) indicated that people tend to evaluate the benefits of a given technology based on their expected outcomes, which helps them embrace it. In other words, people tend to accept new technology when they can expect that it will provide benefits for them. For example, when a firm implements electronic data interchange technology, employees may expect to experience better data precision, data security, and application procedures, which will help them achieve better work efficiency and make fewer clerical mistakes (Kuan & Chau, 2001). These individual benefits lead employees to embrace the new technology. Accordingly, when employees perceive that DT can provide them with direct benefits at work, they are more likely to embrace it.

Furthermore, since individuals are the only ones who can judge how digital technologies may or may not be utilized, any intent to accept or not accept DT begins with an individual's self-determination (Meske & Junglas, 2021). As a result, perceived direct benefits will likely influence employees' willingness to accept DT at work. Therefore, the following hypothesis is proposed:

H4: Perceived direct benefits are positively associated with the intention to accept DT at work.

DT can change micro-level work practices and (re)define value propositions and organizational identity (Wessel et al., 2021). However, these new value propositions and organizational identity may not be directly recognized by employees, even though they substantially benefit the adopting firm regarding strategic and competitive advantages and corporate image. While indirect benefits may not directly favor employees, new value propositions can increase the adopting firm's long-term profitability (Verhoef et al., 2021; Vial, 2019), which in turn can lead to improved internal service quality and ultimately benefit employees (Sasser et al., 1997). Thus, when the adopting firm can demonstrate how DT benefits the firm, its employees are likely to recognize how their own benefits may come from improved internal service quality. Therefore, we propose the following hypothesis:

H5: Perceived indirect benefits are positively associated with the intention to accept DT at work.

RESEARCH METHODOLOGY

Questionnaire Development

Our research data were collected using a carefully developed survey instrument, which consisted of three parts. The first part explained the purpose of the study and ensured that only individuals who had experience with DT at work were eligible to participate in our survey. The second part collected data on all indicators of our research constructs, including intent to implement DT, inertia, perceived direct benefits, perceived indirect benefits, resistance to change, and management support, using a seven-point Likert scale. The final part aimed to understand the demographic variables of the respondents. The measures used in the survey are summarized in Appendix A.

We developed measures according to the guidelines suggested by MacKenzie et al. (2011). First, we reviewed the literature and developed and adapted measures suitable for our study, achieving face validity. The main adaptation for measures was to ensure that all items were relevant to personnel implementing DT in the workplace. To ensure content validity, each of the three researchers (a MIS professor, a doctoral student, and a graduate student) independently evaluated the content of the items. The researchers discussed each construct and its items jointly until they reached an agreement. Although the researchers had diverse opinions on the construct's items, they referred back to the operationalized definition and jointly discussed adopting and adapting the items to reflect the definition. After compiling an English version of the questionnaire, a bilingual researcher (a graduate student) translated the survey items into Chinese. To ensure translation quality, we conducted a pilot study with a professor and doctoral and graduate students to improve the questionnaire quality, including clarity, order of items, descriptions, and confusing wording. We operationalized all constructs using multi-item reflective measures with a seven-point Likert scale anchored from strongly disagree (1) to strongly agree (7).

We also collected demographic data from the respondents, including gender, age, education level, occupation, industry type currently served, experience with DT in the workplace, types of DT implemented, time of DT introduction, and the number of imported DT projects. In this study, these variables are considered control variables, allowing us to better control for the background of the respondents.

Sample and Data Collection

This study investigates the factors influencing individuals' intentions to accept DT at work and their acceptance or rejection of DT in their own firm. We conducted an online survey to collect data for several reasons: first, the Internet can break through geographical barriers; second, online surveys tend to have higher response rates than traditional surveys (Kaplowitz et al., 2004); third, online surveys are more cost-effective and responsive (Denscombe, 2006); and finally, there is no limit to the number of respondents who can participate in the survey. We made the online questionnaire publicly available on major job discussion forums in Taiwan, including Facebook job discussion groups, the biggest bulletin board system in Taiwan (i.e., PTT), the biggest open discussion platform (i.e., Dcard), and other online platforms. Additionally, we established an incentive mechanism to attract respondents and increase the response rate. We asked participants to provide their email addresses in the questionnaire and randomly selected ten participants from the valid sample to receive a USD 3.3 gift card upon survey completion. This reward mechanism was used to encourage knowledgeable people to complete our questionnaire.

Furthermore, to ensure respondents had experience with DT, we included a self-screening question at the beginning of the questionnaire: "Have you implemented or been implementing DT? Common types of DT include big data import, artificial intelligence import, marketing technology

import, electronic supply chain import, financial technology import, industry 4.0 import, metaverse import, and others.” If a respondent had not experienced DT, we did not include them in our sample.

Sample Outline

Overall, we received 195 responses. After removing respondents without experience in DT and incomplete answers, we obtained a valid sample of 148. Table 1 presents the demographic characteristics of eligible participants. The sample is 54% male and 46% female. The majority of participants are aged between 18 and 35. Furthermore, 56% of respondents have a college-level education, and 39% have a master’s degree or higher. As such, the participants are highly educated. Additionally, most respondents work in the manufacturing industry (25%) or the high-tech industry (22%). The respondents come from various types of DT technologies, with big data import (25%), artificial intelligence import (20%), marketing technology import (17%), electronic supply chain (12%), and financial technology introduction (11%) being the most common. In terms of the duration of implementing DT in the firm and workplace, most participants have less than one year of experience (36%) or 1–3 years (39%). Therefore, introducing DT in the workplace has become a trend in recent years, and participants are adapting to new work practices in this context. Ultimately, we believe that the respondents are sufficiently representative.

Nonresponse Bias

We assessed nonresponse bias using the method recommended by Armstrong and Overton (1977). By considering the last group of respondents to be most similar to non-respondents, we compared the first and last quartiles of respondents to test for response bias. The t-test revealed no significant differences between our key research variables’ first and last quartile samples ($p > 0.05$). We also conducted a chi-square test (Shiau et al., 2020) to compare the gender and age variables between the first and last quartile samples, which yielded insignificant results ($p > 0.05$). Thus, we conclude that nonresponse bias is not a serious concern in this study.

DATA ANALYSIS AND RESULTS

We employed SmartPLS Version 4.0.9 to validate measurements and test hypotheses using a partial least squares structural equation model (PLS-SEM). PLS-SEM is a more appropriate choice than covariance-based SEM (CB-SEM) when the sample size is relatively small, the research model is relatively complex, the sample distribution is non-normal, prediction accuracy is critical, and there is a scarcity of theory for applications (Gefen et al., 2011; Hair et al., 2019; Khan et al., 2019; Shiau & Chau, 2016; Shiau et al., 2019; Shiau et al., 2020). These circumstances led us to adopt PLS-SEM. Given that DT is a relatively new trend in the general environment, the number of Taiwanese firms implementing DT in the workplace is relatively small, resulting in a small population of employees who have begun to use new digital work practices. Furthermore, our research model is complex and difficult to examine using CB-SEM. We estimated the measurement model using a factor weighting scheme and the structural model using a path weighting scheme (Hair, Hollingsworth, et al., 2017; Hair, Hult, et al., 2017) and conducted non-parametric bootstrapping with 10,000 replications with no sign changes to obtain the estimates (Hair, Hollingsworth, et al., 2017; Hair, Hult, et al., 2017).

Common Method Variance

To address common method variance (CMV), we employed two approaches. First, we used Harmon’s single-factor test, as Podsakoff et al. (2003) recommended. CMV is a concern when a single factor accounts for more than 50% of the variance (Shiau et al., 2020). Therefore, we conducted a principal component factor analysis, and the results showed that the largest factor accounted for 39.989% of

Table 1. Demographic characteristics of the response sample

Characteristics	Frequency	Percent (%)
Gender		
Male	80	54%
Female	68	46%
Age		
18-25 years	49	33%
26-35 years	48	32%
36-45 years	21	14%
46-55 years	25	17%
56-65 years	5	3%
Education level		
Junior High school	3	2%
Senior High school	5	3%
College & University	83	56%
Graduate or above	57	39%
Firm sector		
Manufacturing industry	37	25%
High-tech industry	33	22%
Financial/Insurance	21	14%
Wholesale &retail trade	20	14%
Education	9	6%
Health care industry	8	5%
Other	13	9%
Missing	7	5%
Firm size		
200 and below	45	30%
201-400	22	15%
401-800	9	6%
801-1600	20	14%
1601 and above	49	33%
Missing	3	2%
Types of DT		
Big data import	75	25%
Artificial intelligence	60	20%
Marketing technology	51	17%
Electronic supply chain	37	12%
Financial technology	32	11%
Industry 4.0	30	10%
Metaverse	8	3%
Other	7	2%

continued on following page

Table 1. Continued

Characteristics	Frequency	Percent (%)
Time of implementing DT		
1 year below	54	36%
1-3 years	57	39%
3-5 years	23	16%
5 years above	14	9%
Current rank in the firm		
Grass-root employee	97	66%
Middle management	34	23%
Top management	17	11%

the variance. No factors accounted for more than 50% of the variance, indicating that the threat of CMV was low.

We used the measured latent marker variable (MLMV) approach as a second method to correct for CMV in our survey, following Chin et al. (2012). The MLMV approach involves collecting multiple items that have no nomological relationship with the research items. We selected MLMV indicators carefully and adapted the items used to measure “trying new features” in Microsoft Office (Sun, 2012) to Microsoft Word, which employees commonly use. We then conducted construct level correction (CLC) to partially rule out the CMV effects in the structural model (Chin et al., 2012). CLC involves creating a CMV control construct for each construct in the research model, using the same set of MLMV items. The CMV construct is modeled as impacting each model construct, leading to more accurate estimates of the structural paths can be obtained (Chin et al., 2012). Following the guidelines of Chin et al. (2012), the results of the structural model are free from CMV.

Measurement Validation

We followed the guidelines from Henseler et al. (2016) and Hair, Hult, et al. (2017) to assess the validity and reliability of the items and constructs. All items had path loadings higher than 0.7 and were significant at a 1% level, except for one item of perceived indirect benefit and one item of MLMV. Therefore, we deleted these two items from the subsequent analysis. The Cronbach’s alpha, composite reliability (CR), and rho_A estimates in Table 2 were all above 0.7 for all constructs, indicating good internal consistency and the reliability of the scales (Hair, Hollingsworth, et al., 2017; Hair, Hult, et al., 2017; Henseler et al., 2016). We also examined convergent validity using the Fornell and Larcker (1981) average variance extracted (AVE) criterion. All AVEs exceeded the minimum threshold value of 0.50 (see Table 2) (Hair, Hult, et al., 2017), indicating the convergent validity of our constructs. The combined results demonstrate the validity and reliability of our measures.

To establish discriminant validity, (1) items should load more highly on the construct they intend to measure than on other constructs, (2) the square root of the AVE by each construct should be larger than the inter-construct correlations, and (3) the heterotrait-monotrait ratio of correlation (HTMT) should be smaller than 0.9 (Hair et al., 2019). Appendix B shows that all items loaded more highly on their intended construct than on others. The square root of the AVE for each construct in Table 3 was greater than 0.819 and greater than the correlations between the construct and other constructs, indicating that the constructs share more variance with their indicators than with other constructs. All HTMT values in Table 4 were smaller than 0.9, suggesting a clear distinction between the constructs. Therefore, our measures demonstrated sufficient discriminant validity.

Table 2. Convergent validity

Construct	Items	Factor loading	Cronbach's α	rho_A	CR	AVE
Intention to accept DT	IADT1	0.903	0.896	0.896	0.935	0.828
	IADT2	0.916				
	IADT3	0.910				
Management support	MS1	0.858	0.889	0.892	0.923	0.751
	MS2	0.886				
	MS3	0.894				
	MS4	0.826				
Resistance to change	RC1	0.836	0.919	0.928	0.943	0.805
	RC2	0.919				
	RC3	0.931				
	RC4	0.900				
Perceived inertia	PI1	0.922	0.922	0.923	0.951	0.866
	PI2	0.953				
	PI3	0.916				
Perceived direct benefits	PDB1	0.904	0.801	0.819	0.885	0.723
	PDB2	0.919				
	PDB3	0.711				
Perceived indirect benefits	PIB1	0.792	0.837	0.849	0.891	0.671
	PIB2	0.825				
	PIB3	0.846				
	PIB5	0.813				
MLMV	MLMV1	0.922	0.893	0.905	0.933	0.824
	MLMV2	0.921				
	MLMV3	0.879				

Table 3. Discriminant validity: Fornell-Larcker criterion

	IADT	MLMV	MS	PDB	PIB	PI	RC
IADT	0.91						
MLMV	0.252	0.908					
MS	0.478	0.289	0.866				
PDB	0.531	0.158	0.393	0.85			
PIB	0.612	0.183	0.623	0.583	0.819		
PI	-0.586	-0.052	-0.246	-0.377	-0.356	0.93	
RC	-0.604	-0.12	-0.286	-0.432	-0.454	0.714	0.897

Note: Diagonal bold values are the square roots of AVE of each construct.

Table 4. Discriminant validity: Heterotrait–Monotrait (HTMT)

	IADT	MLMV	MS	PDB	PIB	PI	RC
IADT							
MLMV	0.279						
MS	0.534	0.325					
PDB	0.628	0.183	0.467				
PIB	0.698	0.201	0.715	0.717			
PI	0.643	0.057	0.267	0.439	0.403		
RC	0.661	0.134	0.31	0.499	0.505	0.777	

Structural Model

To evaluate for multicollinearity, we examined each set of exogenous constructs separately for each subpart of the research model, as suggested by Hair, Hult, et al. (2017). Our analysis revealed that all the variance inflation factors (VIF) of endogenous constructs in our model were less than three, which is well below the threshold of five recommended by Hair, Hult, et al. (2017). Therefore, our results suggest that there is no multicollinearity issue in our model.

To assess the significance of the path coefficients in the structural model, we utilized SmartPLS, which generated 10,000 samples through a bootstrapping technique that employed the PLS algorithm, a path weighting scheme, and a bias-corrected and accelerated confidence interval (CI), as recommended by Aguirre-Urreta and Rönkkö (2018). The results of the structural model estimation are displayed in Figure 2. Our analysis revealed that the full model has an R^2 value of 59.2% for the intention to accept DT.

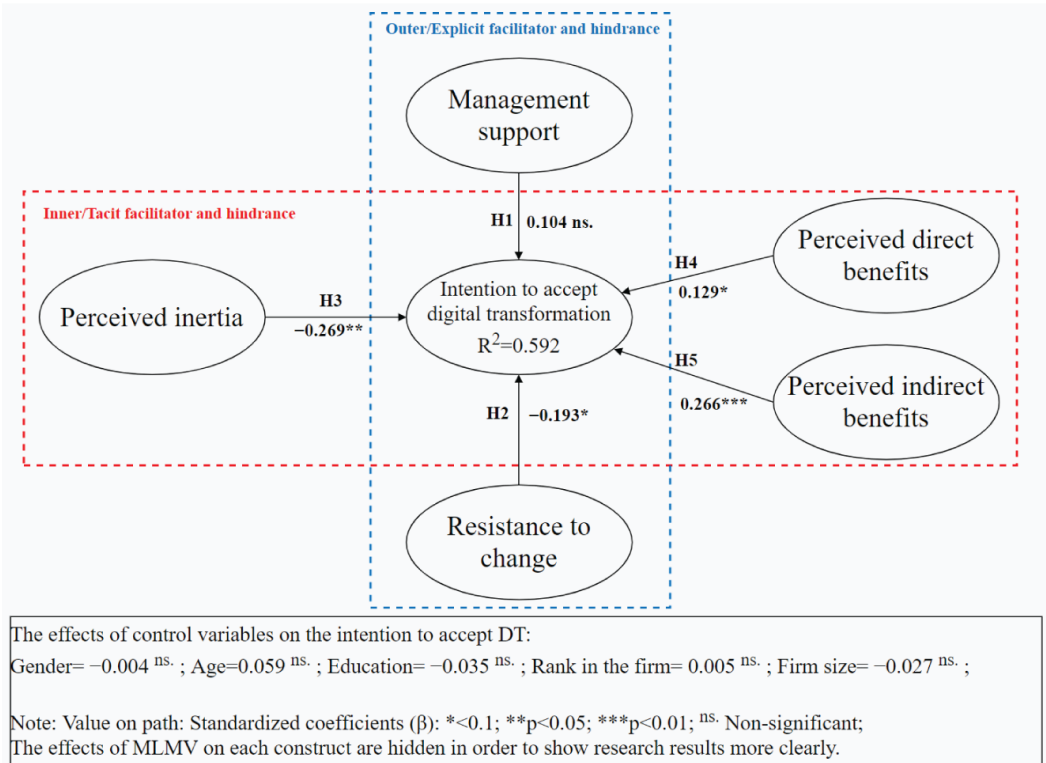
Our results indicate that while management support does not significantly facilitate the employee’s intention to accept DT ($\beta = 0.104, p > 0.1$), resistance to change can significantly hinder it ($\beta = -0.193, p < 0.1$). Therefore, we reject Hypothesis 1 but support Hypothesis 2. Despite prior studies emphasizing the importance of management support in promoting the adoption and implementation of information technologies and systems, our findings suggest that it may not be enough to change employees’ mindsets and encourage them to embrace DT and new digital practices. We discuss this issue in the following section. Additionally, our research results reveal that perceived inertia can harm the intention to accept DT ($\beta = -0.269, p < 0.05$), supporting Hypothesis 3. Furthermore, the perceived direct benefits ($\beta = 0.129, p < 0.1$) and perceived indirect benefits ($\beta = 0.266, p < 0.01$) significantly facilitate the employee’s intention to accept DT. As a result, both Hypothesis 4 and Hypothesis 5 are supported. Lastly, all control variables were found to be insignificant.

Post Hoc Analyses

Following the main analysis, we conducted post hoc analyses to investigate potential relationships among the research constructs in our study. Initially, we explored the moderating effects of management support on the associations between perceived direct and indirect benefits and the intention to accept DT. To test these moderating effects, we used a two-stage approach and created an interaction term using the standardized method recommended by Hair, Hult, et al. (2017). However, our results did not provide evidence of such moderating effects. Subsequently, we assessed the moderating effect of perceived inertia on the relationship between resistance to change and the intention to accept DT. Our findings confirmed the existence of this moderating relationship ($\beta = 0.111, p < 0.05$).

Subsequently, we examined potential indirect effects among our research constructs, as the constructs representing the outer/explicit aspects may impact the intention to accept DT through the inner/tacit aspects and vice versa. Our analysis revealed that management support could influence

Figure 2. Structural model



the intention to accept DT through perceived indirect benefits ($\beta = 0.135, p < 0.05$) but not through perceived direct benefits ($\beta = 0.043, p > 0.05$). Furthermore, we found that perceived inertia could affect the intention to accept DT through resistance to change ($\beta = -0.137, p < 0.1$).

Based on our findings that perceived inertia can play dual roles as both an exogenous construct and a moderator that affects the relationship between resistance to change and the intention to accept DT, we propose a further examination of its complex interplay. This additional analysis will enable us to better understand the combined moderating and mediating paths of perceived inertia in relation to resistance to change and intention to accept DT. To investigate these relationships, we utilized the path analysis and PROCESS module of SmartPLS 4.0.9 (Hayes, 2018; Sarstedt et al., 2020), employing the standardized method, 10,000 percentile bootstrapping, and two-tailed tests. Our results indicate that perceived inertia can positively affect resistance to change ($\beta = 0.684, p < 0.01$), which, in turn, negatively influences the intention to accept DT ($\beta = -0.293, p < 0.05$). Furthermore, we found that perceived inertia can also moderate the relationship between resistance to change and the intention to accept DT ($\beta = 0.14, p < 0.05$). Therefore, the total effects of perceived inertia on the intention to accept DT are -0.507 at the $p < 0.01$ level. We will discuss these results in the following section.

IMPLICATIONS AND CONCLUSION

This study explores employees' intentions to accept the implementation of DT in the workplace. We developed our research model and hypotheses based on the dilemmatic dual-factor perspective from the employee's point of view. We identified the employee's outer/explicit and inner/tacit facilitators and barriers affecting the intention to accept DT. Recent studies on DT have focused mainly on

reviewing and defining the phenomenon (Verhoef et al., 2021; Vial, 2019; Wessel et al., 2021). Some empirical studies have adopted a strategic and innovative perspective from the firm's point of view to understand DT implementation (Akhtar et al., 2022; AlNuaimi et al., 2022; Ciampi et al., 2022; Davison et al., 2023; El Sawy et al., 2020; Singh & Hess, 2020). However, fewer studies examine the employee's perspective to understand how to affect their reactions and mindset toward embracing DT. This is critical because DT generally involves significant changes in micro-level work and work practices (Verhoef et al., 2021; Vial, 2019; Wessel et al., 2021). Therefore, our research results fulfill this knowledge gap and contribute new insights to the literature and practice by showing how to facilitate employee acceptance of DT and offset potential barriers.

Theoretical Implications

As the world enters the digital era, firms in almost every sector have launched a series of projects to explore utilizing new digital technologies to gain a competitive advantage. Researchers have also indicated that DT can redefine or reshape, adopting firms' business models, products/services, and practices (Verhoef et al., 2021; Vial, 2019; Wessel et al., 2021). Therefore, firms must establish internal management procedures to handle such complex transformations. One critical approach is to formulate a DT strategy as a central principle and appoint a chief digital officer to oversee the implementation of DT within the firm (Davison et al., 2023; Matt et al., 2015). Although we have gained a better understanding of what DT is and how to develop a DT strategy from the firm's point of view, we know little about how to encourage employees to embrace DT and implement it in their daily work. Specifically, no studies have focused on employees' intentions within firms to either reject or embrace new digital technologies and work practices, which can hinder the dissemination and infusion of DT in the firm. Therefore, based on the dilemmatic dual-factor perspective, this study proposes outer/explicit and inner/tacit facilitators and barriers and explores in depth how such positive and negative forces impact the intention to accept the implementation of DT.

In terms of the outer/explicit facilitator and hinderance, we found that while management support fails to facilitate the intention to accept DT, resistance to change harms such intention. This result contradicts prior studies that have generally demonstrated that management support is a critical facilitator for successful IT/IS adoption and implementation (Gangwar et al., 2014; Nah et al., 2001; Shao et al., 2017). However, our post hoc analyses reveal that management support can still influence the intention to accept DT through perceived indirect benefits, suggesting a more nuanced role of management support in DT acceptance.

Our results indicate that management support might not be sufficient to change employees' mindset towards accepting DT. One possible reason for this is that DT involves comprehensive and fundamental changes in work practices (Verhoef et al., 2021; Wessel et al., 2021), often requiring employees to learn new knowledge and skills. Therefore, management may need to exert additional efforts to transform employees' mindsets. For example, they may need to attend to individual employees' needs and provide direct communication and guidance (Shao et al., 2017). Additionally, management can illustrate how DT benefits the firm through improved collaboration with customers and suppliers and better commercial methods and strategies. This underscores the need for management to focus on multiple support aspects beyond simply providing resources and encouragement for IT/IS adoption and implementation. Otherwise, DT may elicit employees' resistance to change, as we proposed in Hypothesis 2. Consequently, this study suggests that the role of management support in DT acceptance may not be limited to direct facilitation but could also encompass indirect pathways. This expands the understanding of how management support contributes to DT adoption and highlights the importance of considering indirect benefits in future research.

As prior research has suggested (Ali et al., 2016; Kim & Kankanhalli, 2009), we find that resistance to change can indeed make employees less willing to accept DT. Our research results further imply that resistance to change may compromise the positive effect of management support on the intention to accept DT. As Wessel et al.'s (2021) study of Beta shows, "a number of employees quit

the company as they considered the change in the direction of the company to be in misalignment with their competence. (p. 115)” Therefore, more comprehensive training programs for employees may be required to transform their resistant mindset. Additionally, management can communicate that DT can increase the firm’s competitive advantage, which can facilitate employees’ intention to accept DT, as the result of Hypothesis 5 suggests.

Similar to prior studies (Polites & Karahanna, 2012), this study also confirms that perceived inertia is critical in impeding employees’ intention to accept DT. However, this study extends the research context from IT/IS adoption and implementation to DT, contributing to the explanatory boundary of the literature. Our results also highlight the importance of understanding the psychological factors influencing employees’ intention to change. For instance, the theory of planned behavior (Ajzen, 1985) suggests that an individual’s intention to engage in a behavior is influenced by their attitude towards the behavior, their subjective norms (i.e., social pressure to perform the behavior), and their perceived behavioral control (i.e., perceived ease or difficulty of performing the behavior). In the context of DT, employees’ perceived inertia can be considered a barrier to their perceived behavioral control, which, in turn, can influence their intention to accept the change. Understanding these inner factors can help firms develop more effective strategies to promote DT, such as addressing employees’ concerns, providing training and support, and creating a culture of innovation and continuous learning.

Furthermore, we found that perceived inertia can negatively influence the intention to accept DT through resistance to change and can also moderate the relationship between resistance to change and the intention to accept DT. These findings on the dual role of perceived inertia contribute to a more comprehensive understanding of the construct and the complexity of DT adoption processes. Future research can highlight the need for firms to proactively address and manage perceived inertia among employees to facilitate DT adoption.

Additionally, the research results show that perceived direct and indirect benefits can facilitate employees’ intention to accept DT. However, perceived indirect benefits are significantly more related to the intention to accept DT ($\beta = 0.266, p < 0.01$) than perceived direct benefits ($\beta = 0.129, p < 0.1$). From the perspective of neoclassical economics, individuals are bounded by rationality and opportunism and thus generally pursue maximizing their individual interests. However, our results do not reflect this assumption but instead show that individuals are more willing to accept change (i.e., DT) because of collective benefits (i.e., indirect benefits). This somewhat reflects what Wessel et al. (2021) proposed: that the firm needs to initiate a new identity claim and leverage it to promote DT. In other words, when employees embrace a new identity in the digitalized firm, they are likely to accept DT.

Overall, this study confirms that management support and perceived direct and indirect benefits are positively related to the acceptance of DT intentions. Resistance to change is negatively correlated with the acceptance of DT intentions. Therefore, the research framework and analysis results of this study can provide valuable insights for academic institutions conducting further research on this topic, as well as serve as a reference for businesses seeking to implement DT-related research in the future.

Practical Implications

DT involves the integration of digital technologies into all areas of a firm, which fundamentally changes how it operates and delivers value to its customers (Hanelt et al., 2021; Vial, 2019; Wessel et al., 2021). With the emergence of advanced technologies such as artificial intelligence (AI), blockchain, and IoT, the pace of DT has accelerated. For example, AI has the potential to revolutionize decision-making and automate tasks in various industries, while blockchain can enable secure and transparent transactions. IoT can enable the connection of devices and the gathering of data that can be used to optimize operations and enhance customer experiences. However, failing to undertake DT can result in a firm being unable to keep up with changing trends in the business environment (Hanelt et al., 2021) and losing its competitive advantage. Therefore, firms of all sizes must prioritize DT to stay competitive and relevant.

While many firms in various industries strive to adapt to the rapidly evolving environment, DT implementation requires significant organizational changes. For the successful implementation of DT, it is critical to consider the perceptions of internal employees. The attitudes of employees towards new digital technologies and work practices can significantly impact the success of DT within the organization. Employees who are open and receptive to change can benefit the organization by embracing new working methods and enhancing their skills. This study provides practical recommendations that firms can consider for a successful DT implementation.

First, we suggest that firms provide adequate training programs to employees on new digital technologies and work practices. This can foster a culture of continuous learning and improvement, involving employees in the decision-making process and establishing clear communication channels to address concerns and gather feedback. By following these recommendations, firms can create a more supportive and collaborative environment for DT implementation, leading to less resistance to change and increased productivity and innovation. Additionally, as suggested by McKinsey & Company, most transformation failures are caused by incomplete planning, contradictory goals, and imprecise methods (Bughin et al., 2018). Therefore, we also recommend that firms appoint a chief digital officer and organize a dedicated team to drive transformation initiatives and provide a comprehensive resolution for employees (Davison et al., 2023; Wessel et al., 2021).

Second, firms can assist employees in overcoming perceived inertia and reduce their resistance to change. One approach is to create awareness and understanding. As previously suggested, firms can conduct training sessions or workshops to educate employees about the direct and indirect benefits of DT and how it can improve their work and the organization's performance. Managers can also recognize that employees may have different levels of perceived inertia and resistance to change and adopt a personalized approach to support and meet individual employees' specific needs and concerns, helping them embrace DT initiatives. Firms can foster a culture of innovation by encouraging employees to share their ideas and suggestions for DT, empowering them to contribute to the change process. This requires top management support. We further recommend that firms involve employees in the planning process for DT initiatives by seeking their feedback and input. This may increase employees' sense of ownership and involvement in the change process, mitigating their perceived inertia and negative reaction. Moreover, change management strategies should be designed with a comprehensive understanding of the roles of perceived inertia and resistance to change in the DT adoption process, which may involve addressing employees' concerns and providing adequate resources and support throughout the change process. Finally, firms may offer incentives and rewards to employees who actively participate in DT initiatives, such as bonuses or promotions, which can help reduce perceived inertia by providing employees with direct benefits for their involvement.

Limitations and Future Research

Our research has several limitations worth noting. Firstly, the study may be limited in scope due to geographic restrictions. Data was primarily collected from Taiwanese employees. Thus, the generalizability of research results may be limited to countries in Pacific Asia. Future studies may conduct multi-country research to collect data from different countries and compare the differences in the effects of facilitators and hindrances on the intention to accept DT.

Second, prior studies have proposed various constructs that affect employees' intention to accept various objects. Several possible facilitators and hindrances may influence employees' intention to embrace DT from different theoretical perspectives. Nevertheless, based on the dilemmatic dual-factor perspective, this study provides useful insights into the literature by showing the effects of dilemmatic positive and negative factors on the intention to accept DT. Future studies may explore more facilitators and hindrances affecting this intention, such as disappointment of expectations, regret, pressure, satisfaction, and others. Moreover, our study may neglect some potential control variables that could impact the relationships between the constructs of this study. Future research should consider incorporating other theoretical control variables to account for potential confounding

factors. Additionally, future research may compare the path coefficients of our research constructs with other constructs to identify more significant and critical facilitators and hindrances from the employee's perspective. It is possible that further investigation may uncover even more critical facilitators and hindrances than those we have proposed.

Third, we utilized cross-sectional data to assess our research model, and while the proposed research hypotheses were derived theoretically, the results still reflect associations rather than causality. Future research may seek to test and extend our research model using longitudinal data.

Fourth, this study relied on perceptual measures, which may not accurately reflect the theoretical constructs we examined. However, employees' perception largely determines their perspectives, decisions, and reactions, so this limitation may not be severe.

Fifth, our questionnaire contained over twenty-five items, which could cause participant fatigue. This may result in lower response rates, hasty responses, or incomplete data. Future research can address this issue by reducing the number of measurement items to streamline the survey and minimize respondent fatigue.

Lastly, nonresponse bias may be present in our study, potentially underrepresenting certain employees' perspectives and experiences. This could skew the findings and limit their generalizability. We conducted a nonresponse bias analysis to tackle this issue and found no statistically significant bias.

CONCLUSION

This study explored employees' willingness to adopt DT in the workplace. We developed and tested a model that illustrates how outer/explicit and inner/tacit factors affect employees' intention to accept DT. The results revealed that both types of factors play a significant role in employees' acceptance intention. We found that perceived direct and indirect benefits of DT had a positive impact on employees' acceptance, while resistance to change and perceived inertia were significant obstacles. The research also revealed that management support alone is insufficient to encourage employees to accept DT. This study is distinct from prior research, which typically focused on how firms could successfully implement DT. Instead, this study provides valuable insights into how employees' intentions can be understood and promoted in the context of DT.

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COMPETING INTERESTS

The authors of this publication declare there are no competing interests.

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APPENDIX A

Questionnaire Items

Intention to Accept DT (Agarwal & Karahanna, 2000)

- IADT1. I plan to embrace the support of the DT in the future.
- IADT2. I intend to continue using the support of the DT in the future.
- IADT3. I expect my use of the support of the DT to continue in the future.

Perceived Inertia (Prakash & Das, 2021)

- IN1. I will continue using my existing method (without the support of the DT) to solve my problem at work because it would be stressful for me to make changes.
- IN2. I will continue to use my existing method (without the support of the DT) to solve my problem at work simply because I have done so regularly in the past.
- IN3. I will continue to use my existing method (without the support of the DT) to solve my problem at work even when I know that this may not be the best (most efficient/most effective) way to do it.

Management Support (Bala & Venkatesh, 2016)

- MS1. The management supports the implementation of DT in our firm.
- MS2. The management understands the potential benefits of DT in our firm.
- MS3. The management encourages the use of DT in our firm.
- MS4. The management provides necessary help/resources for DT in our firm.

Perceived Direct Benefits (Kuan & Chau, 2001)

- PDB1. The implementation of the DT can improve my operation efficiency.
- PDB2. The implementation of the DT can speed up my work process.
- PDB3. The implementation of the DT can reduce my administrative errors.

Perceived Indirect Benefits (Kuan & Chau, 2001)

- PIB1. The implementation of the DT can improve our firm's image.
- PIB2. The implementation of the DT can enhance our firm's competitive advantage.
- PIB3. The implementation of the DT can benefit other business practices.
- PIB4. The implementation of the DT can improve our customer services. (deleted)
- PIB5. The implementation of the DT can improve the relationship with our business partners.

Resistance to Change (Freeze & Schmidt, 2015)

- RC1. I will not comply with the change to the new way of working with our DT.
- RC2. I will not cooperate with the change to the new way of working with our DT.
- RC3. I oppose the change to the new way of working with our DT.
- RC4. I do not agree with the change to the new way of working with our DT.

Marker Variable Word Usage Experience (Sun, 2012)

MV1. I played around with features in Microsoft Word.

MV2. I used some Microsoft Word features by trial and error.

MV3. I tried new features in Microsoft Word.

MV4. I figured out how to use certain Microsoft Word features. (deleted)

APPENDIX B

Cross-loadings of the constructs

	Intention to accept DT	Management support	Perceived direct benefits	Perceived indirect benefits	Perceived inertia	Resistance to change	MLMV
IADT1	0.903	0.45	0.497	0.592	-0.495	-0.522	0.31
IADT2	0.916	0.422	0.484	0.522	-0.536	-0.574	0.191
IADT3	0.91	0.434	0.469	0.557	-0.57	-0.554	0.185
MS1	0.43	0.858	0.352	0.573	-0.254	-0.313	0.254
MS2	0.42	0.886	0.386	0.566	-0.318	-0.324	0.242
MS3	0.457	0.894	0.349	0.56	-0.175	-0.223	0.224
MS4	0.343	0.826	0.269	0.453	-0.095	-0.12	0.286
PDB1	0.483	0.34	0.904	0.459	-0.335	-0.392	0.11
PDB2	0.468	0.338	0.919	0.497	-0.326	-0.387	0.184
PDB3	0.399	0.326	0.711	0.544	-0.3	-0.317	0.105
PIB1	0.49	0.553	0.416	0.792	-0.291	-0.391	0.167
PIB2	0.455	0.537	0.481	0.825	-0.318	-0.409	0.069
PIB3	0.584	0.55	0.549	0.846	-0.311	-0.426	0.213
PIB5	0.453	0.39	0.452	0.813	-0.243	-0.244	0.127
PI1	-0.535	-0.22	-0.284	-0.322	0.922	0.711	-0.067
PI2	-0.523	-0.195	-0.36	-0.316	0.953	0.696	-0.044
PI3	-0.574	-0.267	-0.404	-0.353	0.916	0.591	-0.034
RC1	-0.448	-0.196	-0.301	-0.302	0.613	0.836	-0.097
RC2	-0.55	-0.268	-0.402	-0.385	0.601	0.919	-0.17
RC3	-0.552	-0.26	-0.46	-0.464	0.653	0.931	-0.136
RC4	-0.602	-0.292	-0.374	-0.459	0.694	0.9	-0.029
MV1	0.266	0.264	0.175	0.166	-0.058	-0.141	0.922
MV2	0.21	0.278	0.144	0.201	-0.041	-0.086	0.921
MV3	0.204	0.243	0.105	0.126	-0.04	-0.095	0.879

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