

Enhancing employees' readiness for digital transformation: findings from SEM and fsQCA approaches based on the planned behavior perspective

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Abstract

Purpose – This paper is aimed at discussing how to enhance the readiness for digital transformation (RDT) of employees, helping enterprises to overcome the internal resistance to change. Based on the theory of planned behavior (TPB), this study constructs an antecedent linkage model of RDT.

Design/methodology/approach – Data were collected via a two-stage questionnaire survey from 285 employees undergoing digital transformation. Structural equation modeling using AMOS tested the net effects of antecedents, while fuzzy-set qualitative comparative analysis (fsQCA) identified causal configurations for RDT.

Findings – (1) Employee involvement, digital transformational leadership, digital transformational self-efficacy and psychological resilience can significantly enhance RDT, while threat perception of digital transformation negatively affects RDT; (2) No single antecedent constitutes a necessary condition for high RDT; (3) Three configurations, namely “Organizational empowerment – Threat mitigation,” “Organizational empowerment – Self-efficacy” and “Leadership guidance – Confidence and tenacity,” can generate high RDT and (4) Two configurations, namely “Organizational incapacity – Lack of literacy” and “Organizational incapacity – Threat pressure,” result in non-high RDT.

Originality/value – This study investigates the impact of the coupling of antecedents on employees' RDT from the perspective of planned behavior, which is essential for laying the micro foundation for the digital development of enterprises.

Keywords Digital transformation, Readiness for change, Theory of planned behavior, SEM, fsQCA

Paper type Research article

1. Introduction

The acceleration of digital transformation has emerged as a critical enabler for enterprises aiming to establish sustainable competitive advantage. Nevertheless, digital transformation within enterprises simultaneously presents novel opportunities for development and a suite of pressures and challenges. For instance, a global survey conducted by the Boston Consulting Group, encompassing over 850 firms, revealed that a mere 35% of companies have successfully realized their digital transformation objectives [1]. Addressing this issue, scholarly research underscores the necessity of mature digital capabilities, a robust digital culture, and a digital mindset for the successful implementation of digital transformation



(Kozanoglu and Abedin, 2021). Despite this, the extant research predominantly concentrates on top-down management and leadership perspectives, with a relative paucity of literature addressing the employee level (Butt *et al.*, 2024). From a micro-individual perspective, the digital illiteracy and obsolescent attitudes among organizational members, particularly grassroots employees, constitute a significant factor contributing to the failure of organizational digital transformation initiatives (Klein *et al.*, 2024).

For example, in the catering services sector, the adoption of digital technologies like online reservation systems, which potentially enhance employee-customer interactions, might also be perceived by employees as an extra source of work stress and could cause deviations from established procedures. This reveals a considerable gap in fostering employees' RDT regarding emotional responses, cognitive orientations, and behavioral dispositions. The absence of readiness for change may direct employees' focus to the "dark side" implications of digital transformation (Marsh *et al.*, 2022). Therefore, cultivating a workforce that is prepared and receptive to digital transformation is pivotal for the smooth execution of enterprises' digital transformation initiatives.

The Employees' RDT concept derives from the domain of change management. While prior research has centered on the organizational level, assessing the preparedness of organizations for transformation initiatives, studies at the individual level remain underexplored (Tangwaragorn *et al.*, 2024; David *et al.*, 2024). This imbalance hinders a unified understanding of digital transformation within organizations. We draw on the literature concerning employees' attitudes towards change and define RDT as the degree to which employees accept, tolerate, and actively engage in their organization's digital transformation efforts (Holt *et al.*, 2007). Based on this foundation, we systematically reviewed the antecedents of employees' readiness for change. These antecedents can be categorized into three dimensions: organizational, leadership, and individual. At the organizational level, key antecedents include organizational culture (Haffar *et al.*, 2023), team fairness (Kebede and Wang, 2022), and interpersonal justice (Koehler *et al.*, 2024). Leadership-level antecedents encompass leader-member exchange (Sethi *et al.*, 2023), leaders' championing behavior (Sadaric and Skerlavaj, 2024), and communication behaviors (Endrejat *et al.*, 2021). Finally, at the individual level, antecedents such as psychological capital (Luo *et al.*, 2022), job satisfaction (Yang *et al.*, 2024), and affective commitment (Alqudah *et al.*, 2022) have been identified.

Our review identifies two critical gaps in the existing theoretical framework. First, most studies on the antecedents of employees' readiness for change have been conducted within the context of traditional change management. Unlike conventional organizational change, digital transformation emphasizes intelligent business processes, digital operations, and data-driven strategies, which introduce new job requirements and pressures (Tursunbayeva and Chalutz-Ben Gal, 2024). Consequently, findings from traditional change management research may not fully capture the unique challenges of digital transformation, potentially limiting their applicability in this context. Second, the antecedents of employees' readiness for change are not independent. Instead, antecedents at different levels can interact and exert a synergistic effect on RDT. However, the extant research on the antecedents of employees' attitudes towards change mainly consists of qualitative studies or quantitative research employing traditional regression analyses (Klein *et al.*, 2024; Alqudah *et al.*, 2022). These studies typically focus on the isolated effect of a single factor or the interaction effects of no more than three factors (Weber *et al.*, 2022), failing to conduct an in-depth exploration of the synergistic effects among multiple factors. This limitation impedes the formulation of a systematic strategy for enhancing employees' RDT.

Given that RDT results from employees' systematic evaluation of their environment and circumstances, it is imperative to integrate the net effect concept with the configurational concept. Guided by the Theory of Planned Behavior, this study systematically investigates the antecedent mechanisms influencing RDT. The core research questions explored in this inquiry are as follows:

- RQ1. Is there a significant net effect relationship between each antecedent and RDT?
- RQ2. Can any antecedent serve as a necessary condition for RDT?
- RQ3. What configurations of antecedents satisfy the sufficiency criteria for achieving high or non-high levels of RDT?

The challenges in addressing these issues are multifaceted. Firstly, the mechanisms by which antecedents influence RDT have been inadequately explored, requiring a systematic investigation within a cohesive theoretical framework. Secondly, accurately assessing and effectively addressing employees' RDT is challenging, demanding comprehensive field studies within transforming organizations to collect robust primary data. Lastly, the complexity of examining the antecedent linkage mechanisms to RDT calls for methodological innovation to overcome the limitations of traditional methods in handling complex causal relationships and to analyze both the direct and configurational effects of multidimensional antecedents.

To address the aforementioned challenges, this study collected data from 285 employees within enterprises undergoing digital transformation. By utilizing SEM and fsQCA, the study investigates both the direct effects and configurational influences of various antecedents on RDT. This aims to provide nuanced insights that can inform and refine corporate digital transformation strategies at a granular level. Furthermore, this research contributes to the existing literature by bridging the current knowledge gap concerning employee attitudes toward change in the digital economy and by deepening the conceptual understanding of factors influencing RDT.

2. Theory and hypothesis development

2.1 Employees' RDT

The construct of employees' attitudes toward change comprises a sophisticated set of concepts. As research in this area deepens, a relatively consensus-based definition of employee change attitudes has emerged: It represents employees' overall positive or negative evaluation of the change initiatives by an organization, including cognitive appraisals, emotional responses, and behavioral intentions related to it (Bouckennooghe *et al.*, 2009).

Employees' RDT is a key construct within the domain of employee change attitudes. It denotes the extent to which employees accept, tolerate, and welcome change (Holt *et al.*, 2007), emphasizing the beliefs, attitudes, and intentions of organizational members toward digital transformation. Employees' RDT is considered to be in the unfreezing stage. Furthermore, it serves as a fundamental prerequisite for the organization's overall readiness to change. This study categorizes RDT into three dimensions based on its content structure: emotional readiness, cognitive readiness, and intentional readiness (Bouckennooghe *et al.*, 2009). Emotional readiness pertains to employees' affective responses to digital transformation. Cognitive readiness concerns employees' beliefs in the anticipated positive outcomes of it. Intentional readiness reflects the level of employees' willingness to commit resources to it.

2.2 Identification of antecedent conditions

The TPB proposes that behavioral attitudes, subjective norms, and perceived behavioral control influence the psychological processes of employees in behavioral decision-making (Ajzen, 1991). Scholars have applied the TPB to explore employees' willingness to participate in organizational change (Soffer *et al.*, 2023). This study conducts a comprehensive comparison of theoretical literature and empirical materials to delineate the basic assumptions and explanatory logic of the TPB as a suitable theoretical basis for exploring the antecedents of RDT. Utilizing both deductive and inductive methods (Ketchen *et al.*, 1993), we identify antecedent conditions.

First, a deductive approach based on the TPB and tailored to the characteristics of employees' change attitudes generates antecedent selection perspectives including change evaluation, personal valence, subjective norms, change efficacy, and individual traits. (1) Both change evaluation and personal valence belong to behavioral attitude, which refers to employees' evaluations of the potential action outcomes (Ajzen, 1991). The difference between them is that change evaluation captures employees' positive or negative assessments of the organizational change's rationale (Srisathan and Naruetharadhol, 2022), being more oriented towards organizational interests, while personal valence focuses on whether employees can benefit from or be harmed by the change (Armenakis and Harris, 2009), being more self-interest oriented. (2) Subjective norms pertain to the perceived pressure from significant others (Wu *et al.*, 2025). In the context of digital transformation, it specifically refers to the social support or influence provided by subjects such as managers. (3) Both change efficacy and individual traits can be classified under perceived behavioral control, that is, the individual's perception of their ability to perform the behavior. However, there are characteristic differences in their applicable scenarios and functions. The former reflects employees' confidence in adapting to digital transformation challenges and is a control belief in the specific context (Hu *et al.*, 2023). The latter emphasizes the significance of characteristics like employees' personality and literacy and is a control point with general characteristics (Choi, 2011). Integrating task-specific and general psychological dispositions contributes to comprehensively explaining the driving mechanism of antecedents on RDT (Ajzen, 1988).

Second, considering the multitude of potential antecedents to RDT and guided by digital transformation practices, this study employs an inductive method to identify five specific antecedents: employee involvement (change evaluation), threat perception of digital transformation (personal valence), digital transformational leadership (subjective norms), digital transformational self-efficacy (change efficacy), and psychological resilience (individual traits). It is worth noting that digital transformational self-efficacy reflects employees' confidence in their capabilities to effectively engage in change (Shao *et al.*, 2024), which can be metaphorically described as the "spear of offense." In contrast, psychological resilience pertains to employees' capacity to endure and rebound from the pressures associated with digital transformation (Shin *et al.*, 2012), serving as the metaphorical "shield of defense." These functionally distinct constructs exhibit synergistic complementarity.

2.3 Theoretical hypotheses of net effects

2.3.1 *Employee involvement in digital transformation (EID)*. Employee involvement refers to the extent to which employees are permitted to participate in the decision-making, implementation, and improvement processes associated with an enterprise's digital transformation (Selimovic *et al.*, 2021). Based on the TPB, an optimistic attitude can strengthen positive behavioral beliefs and improve their stance towards digital transformation (Ajzen, 1991). Sufficient involvement can enhance employees' understanding and foster a positive attitude towards change (Monferdini and Bottani, 2024), which aligns with the connotation of "change evaluation" and can promote the improvement of RDT (Zheng *et al.*, 2025). First, personal involvement allows employees to communicate with the organization, deepening their understanding of the purpose and expected outcomes of digital transformation (Selimovic *et al.*, 2021). As a result, employees are more likely to develop favorable expectations toward the change and demonstrate higher levels of RDT. Second, employee involvement enables them to recognize the urgency and significance of the enterprise's digital transformation efforts and the organization's expectations for their support, prompting their participation in the change. Third, employee involvement empowers employees by making them aware of their influence within the enterprise, bolstering their confidence and resolve to navigate digital transformation (Ullrich *et al.*, 2023). Therefore, we can hypothesize:

H1. Employee involvement positively impacts RDT.

2.3.2 *Threat perception of digital transformation (TPD)*. Threat perception of digital transformation denotes the perceived loss or uncertainty among employees resulting from digital transformation, encompassing risk threats such as privacy violations and status conflicts (Bala and Venkatesh, 2016). The TPB emphasizes that individuals tend to form negative attitudes towards things that may bring adverse results and reduce resource investment in them (Ajzen, 1991). Threat perception, a negative “personal valence” of employees towards digital transformation (Armenakis and Harris, 2009), can hinder the improvement of RDT. Scholars have recognized the multiplicity of stressors that digital transformation inflicts on employees (Marsh *et al.*, 2022). For instance, the inherent risk threats in digital transformation have elicited anxiety (Klein *et al.*, 2024), leading employees to adopt a state of passive adaptation or to actively resist change (Bausch *et al.*, 2024). Digital transformation creates onerous pressure sources, such as heightened workloads and job eliminations, imposing new demands (Tursunbayeva and Chalutz-Ben Gal, 2024). These pressures shape employees’ pessimistic expectations for their career development after digital transformation, which can hinder the improvement of RDT. Therefore, the following hypothesis is posited:

H2. Threat perception of digital transformation negatively impacts RDT.

2.3.3 *Digital transformational leadership (DTL)*. Digital transformational leadership represents the fusion of managers’ digital thinking with traditional transformational leadership (Palmucci *et al.*, 2025; Odai *et al.*, 2025). It shapes employees’ emotional experiences, cognitive dispositions, and behavioral intentions by establishing a digital transformation blueprint (AlNuaimi *et al.*, 2022). Combining with the TPB (Ajzen, 1991), digital transformational leadership can leverage normative guidance and resource support to cultivate employees’ “subjective norms,” which in turn influence their RDT. Digital transformation can cause practical issues such as dehumanized management and privacy risks, which may trigger negative states including insecurity (Buonocore *et al.*, 2025). In response to this, digital transformational leadership, endowed with robust capabilities and centered on a shared vision of digital transformation, motivates employees to actively engage in the process through digital context interaction, cultivation of digital literacy, and provision of digital resources (Majumdarr *et al.*, 2024). On this basis, employees not only gain the resource foundation to cope with the challenges of transformation but also perceive the strong force of social expectations. This perception cultivates stronger normative beliefs, motivating them to strive for an improvement in their level of RDT. Therefore, the following hypothesis is posited:

H3. Digital transformational leadership positively impacts RDT.

2.3.4 *Digital transformational self-efficacy (DTS)*. Digital transformational self-efficacy pertains to employees’ perceptions of their capability to effectively navigate the challenges associated with digital transformation (Liu and Kamioka, 2025). It conceptually corresponds to the “change efficacy” component proposed earlier. In the framework of the TPB (Ajzen, 1991), self-efficacy represents a form of control belief, enabling employees to adapt to the challenges brought about by digital transformation (Kromah *et al.*, 2024). Firstly, digital transformational self-efficacy influences employees’ emotional management capacity (Chen *et al.*, 2025), activating positive psychological responses, thereby enhancing their emotional readiness. Conversely, low self-efficacy may lead employees to experience an emotional deficit, characterized by a sense of inadequacy in coping with change. Secondly, self-efficacy serves as a positive cognitive resource (Hu *et al.*, 2023). Employees with high self-efficacy facing the ambitious goals of digital transformation can sustain a confident mindset. They exhibit stronger belief in successful digital transformation. Thirdly, employees with digital transformational self-efficacy are more inclined to engage in tasks that present challenges and opportunities (Liu and Kamioka, 2025). They maintain a proactive stance towards novelty, actively engage in digital initiatives that align with organizational directives and enhance their

sense of self-worth (Shao *et al.*, 2024; Ye *et al.*, 2024), thereby demonstrating a strong intentional readiness. Therefore, the following hypothesis is posited:

H4. Digital transformational self-efficacy positively impacts RDT.

2.3.5 Psychological resilience (PR). Psychological resilience refers to an individual's capacity for managing stressful situations and restoring psychological equilibrium (Sürücü *et al.*, 2023), belonging to the general "individual traits". Digital transformation places elevated demands on employees' skills, cognitive patterns, and the allocation of time and energy. Combined with the TPB, in the face of the anticipated adverse pressure, employees with abundant resources possess stronger control beliefs and are better prepared to adapt to digital transformation (Ajzen, 1991). Compared with self-efficacy, psychological resilience not only helps employees cope with the challenging pressure but also enables them to adapt to the obstructive pressure in the process of transformation. In the process of digital transformation, psychological resilience can enhance employees' control beliefs and boost their RDT. On one hand, resilience empowers employees to maintain stability and optimism amidst the pressures of digital transformation (Zhu *et al.*, 2024), and mitigates job displacement fears and anxiety about traditional skill obsolescence. On the other hand, resilience involves traits like responsibility and long-term orientation (Rego *et al.*, 2021). Employees with robust resilience are inclined to avoid myopic behaviors that prioritize personal interests. They are likely to recognize and actively engage in constructive organizational initiatives, such as digital transformation, which facilitates the enhancement of RDT (Al-Ghazali and Afsar, 2022). Drawing on these insights, the following hypothesis is posited:

H5. Psychological resilience positively impacts RDT.

2.4 Matching relationship among antecedent conditions

According to configuration theory, the organizational change environment is characterized by escalating complexity and systematization. There exists a dynamic relationship of interlinkage and evolution between antecedents and outcomes (Huang *et al.*, 2024). It is often the case that no single antecedent is adequate to comprehensively enhance RDT. Instead, the alignment of attributes and the collaborative interplay among different antecedents can exert a more potent promotional effect on RDT. For instance, both digital transformational leadership and digital transformational self-efficacy independently contribute to the enhancement of RDT, and their synergistic integration can yield an effect greater than the sum of its parts (Chen and Kouhsari, 2025). Moreover, the impact of the same antecedent can vary under different combinations and configurations. For example, threat perception of digital transformation impedes the enhancement of employees' readiness, yet under the auspices of organizational supportive factors such as employee involvement and digital transformational leadership, the detrimental effects of this perceived threat may be alleviated (Wolff *et al.*, 2024).

In summary, this study establishes a theoretical framework, depicted in Figure 1.

3. Research design

3.1 Methods

This study adopts an integrative method for the research design, with its methodological flowchart presented in Figure 2. Based on obtaining the original data through two-stage research and conducting a systematic analysis of the reliability and validity of the data, this study respectively investigates the net effect and configuration effect between the antecedents and RDT.

On the one hand, the SEM method is utilized to explore the net effect relationship. Relevant literature indicates that SEM is proficient in inspecting linear relationships between variables,

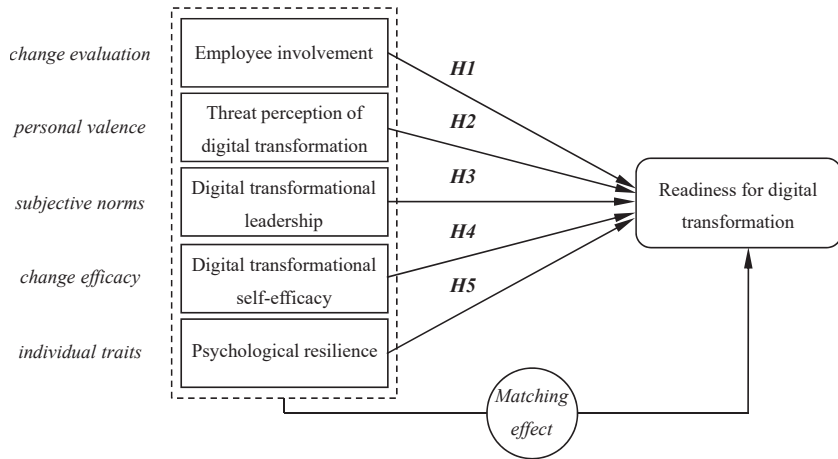


Figure 1. Theoretical framework. **Source(s):** Authors' own work

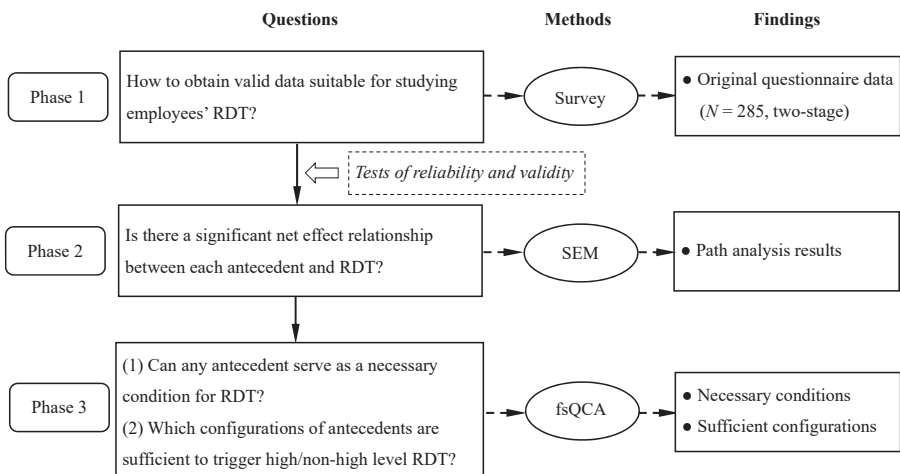


Figure 2. Methodological flowchart. **Source(s):** Authors' own work

making it suitable for testing exploratory models and theoretical hypotheses (Zyphur *et al.*, 2023). It provides precise parameter estimates, which facilitates an understanding of the net effects between antecedents and RDT. Nevertheless, SEM relies on assumptions such as the independence of independent variables, unidirectional linearity, and causal symmetry. Consequently, it might be insufficient in elucidating the complex nonlinear interactions among antecedents and their outcomes.

On the other hand, to address the limitations of SEM in verifying causal concurrent relationships, the integration of fsQCA proves to be indispensable for exploring the interactive and synergistic effects of antecedents. The advantages of fsQCA are numerous: (1) It adeptly handles complex issues such as configuration equivalence and data asymmetry through comparative analysis of the attribute characteristics across diverse case objects (Ragin, 2008);

(2) It combines the advantages of qualitative and quantitative approaches, addressing the generalizability concerns of small-sample qualitative research and compensating for the lack of depth in quantitative research.

3.2 Sample and data collection

The sample for this study encompasses multiple provinces and cities across China, including Shandong, Zhejiang, Sichuan, and Shanghai, spanning various sectors such as manufacturing, transportation, software, and information services. Considering the translation issue of the questionnaire, the research team conducted a pre-survey in Shandong Province in March 2024, collecting a total of 80 questionnaires. Based on the feedback from the pre-survey, the wording of the questionnaire items was refined to enhance clarity and accuracy. In the formal research stage, the team selected enterprises for the study by identifying companies actively engaged in or planning digital transformation through official channels such as annual reports, academic forums, and prior research findings. Subsequently, enterprise representatives were contacted via on-site visits or online communications to explain the research objectives and establish a collaborative relationship. Ultimately, the study's sample population comprises employees directly engaged in digital transformation. It is anticipated that they will adopt new digital workflows, such as advanced accounting software and CRM systems, following the transformation. Their RDT proves crucial for the success of the enterprise's digital endeavors and guarantees the representativeness of the sample.

To mitigate common method bias and examine the temporal relationship between variables, a two-wave time-lagged design was implemented. Upon establishing contact with the respondents, we gathered their email details while assuring them of anonymity and confidentiality. To ensure precise matching for the anonymous dissemination of questionnaires, a unique identifier consisting of a timestamp and a random number was furnished to the respondents. They were then reminded to input the same code during subsequent surveys to facilitate data matching. Throughout the two rounds of survey endeavors, the research team engaged in communication with the respondents via online email and successfully completed both the distribution and collection of the questionnaires. The first wave (T1) was conducted in April 2024, where respondents provided antecedent conditions such as employee involvement and demographic details. The second wave (T2) took place in May 2024, following up with the initial respondents to assess their RDT. A total of 400 questionnaires were distributed, and after excluding invalid ones, 285 valid responses were obtained, yielding a valid response rate of 71.25%. The demographic details of the respondents are presented in [Table 1](#).

The sample population exhibits a balanced gender distribution, with males comprising 50.18%. Regarding age, the 26–35 age bracket had the largest proportion of 44.91%. In terms of job position, the sample included a significant number of front-line employees, which accounted for 52.63%. The distribution of working years was also balanced, with individuals having 3 years or less of experience constituting 35.09% and those with over 10 years constituting 30.88%. Educationally, the largest group consisted of undergraduates, representing 55.33% of the sample. The sample spanned various industries, with the manufacturing sector being the most represented, at 24.91%.

To address potential non-response bias in the questionnaire survey, the study employed an independent samples *t*-test by dividing the questionnaires into two groups based on the chronological order of their return. The analysis revealed that the *t*-values for gender, age, education, job position, industry sector, and tenure were 1.124 ($p = 0.262$), -0.345 ($p = 0.730$), 1.281 ($p = 0.201$), 0.185 ($p = 0.854$), 0.947 ($p = 0.344$), and -0.392 ($p = 0.696$), respectively. No significant differences in the above characteristics were found among the sample subjects across groups ($p > 0.05$), indicating that non-response bias is unlikely to affect the validity of the results.

Table 1. Demographics of the respondents

| Characteristic | Items | Count | Percent | Characteristic | Items | Count | Percent |
|-----------------|-------------------------|-------|---------|-----------------|----------------------|--------|---------|
| Gender | Male | 143 | 50.18% | Age | 20–25 | 80 | 28.07% |
| | Female | 142 | 49.82% | | 26–35 | 128 | 44.91% |
| Job position | Front-line employees | 150 | 52.63% | 36–45 | 62 | 21.75% | |
| | Front-line managers | 59 | 20.70% | >45 | 15 | 5.26% | |
| | Middle managers | 51 | 17.89% | Tenure | ≤3 | 100 | 35.09% |
| | Senior managers | 25 | 8.77% | 4–10 | 97 | 34.04% | |
| Industry sector | Manufacturing industry | 71 | 24.91% | >10 | 88 | 30.88% | |
| | Transportation industry | 37 | 12.98% | Education | High school or below | 6 | 2.11% |
| | Information services | 26 | 9.12% | Junior college | 21 | 7.37% | |
| | Education industry | 22 | 7.72% | Undergraduate | 152 | 53.33% | |
| | Other industries | 129 | 45.26% | Master or above | 106 | 37.19% | |

Source(s): Authors' own work

3.3 Measures and reliability test

This investigation employed a Likert 5-point scale to quantify variables. The items were sourced from established scales and were moderately tailored to align with the context of digital transformation. In light of the linguistic discrepancies between Chinese and English, the study engaged cross-cultural experts and industry practitioners to execute a meticulous translation and pre-testing of the scale. This process was undertaken to guarantee that any language differences would not adversely affect the measurement outcomes.

To measure the involvement degree of sample employees in digital transformation, this study drew on the original scale of [Bouckennooghe et al. \(2009\)](#) and designed 4 items such as “I am regularly informed on how the digital transformation project is going”. Regarding the measurement of threat perception of digital transformation, this study drew on the research of [Bala and Venkatesh \(2016\)](#) and designed a total of 4 items such as “I feel that the digital transformation project might actually degrade my status in the organization”. This study drew on the scale of [AlNuaimi et al. \(2022\)](#) to measure the digital transformational leadership level of the team where the samples were located, and designed 6 items such as “Our leaders provide a clear digital transformation vision for the organization’s members to follow”. Through the digital context adaptation of the change self-efficacy scale of [Ng and Lucianetti \(2016\)](#), this study designed a total of 4 items such as “Wherever the digital transformation project takes place, I’m sure I can handle it”. For the measurement of the resilience, we drew on the psychological capital scale of [Luthans et al. \(2007\)](#) and designed a total of 6 items such as “I usually handle the pressure at work with ease”.

Drawing on the research of [Bouckennooghe et al. \(2009\)](#), a RDT scale containing three dimensions was compiled. (1) Three emotional readiness items such as “I have a good feeling about the digital transformation project” were designed. (2) Three cognitive readiness items such as “Most digital transformation projects that are supposed to solve problems around here will not do much good (reverse proposition)” were designed. (3) Three intentional readiness items such as “I want to devote myself to the process of digital transformation” were designed. The results of the scale reliability test are shown in [Table 2](#). It can be seen that both the composite reliability and Cronbach’s α values of each construct exceed 0.7, suggesting a good level of reliability.

Table 2. Analysis of reliability and convergent validity

| Construct | Indicator loading | Composite reliability | Cronbach's α | AVE |
|--|-------------------|-----------------------|---------------------|-------|
| Employee involvement in digital transformation (EID) | | 0.898 | 0.893 | 0.689 |
| EID1 | 0.857 | | | |
| EID2 | 0.877 | | | |
| EID3 | 0.861 | | | |
| EID4 | 0.716 | | | |
| Threat perception of digital transformation (TPD) | | 0.890 | 0.888 | 0.670 |
| TPD1 | 0.748 | | | |
| TPD2 | 0.857 | | | |
| TPD3 | 0.880 | | | |
| TPD4 | 0.781 | | | |
| Digital transformational leadership (DTL) | | 0.899 | 0.902 | 0.600 |
| DTL1 | 0.691 | | | |
| DTL2 | 0.654 | | | |
| DTL3 | 0.840 | | | |
| DTL4 | 0.799 | | | |
| DTL5 | 0.839 | | | |
| DTL6 | 0.805 | | | |
| Digital transformational self-efficacy (DTS) | | 0.890 | 0.885 | 0.670 |
| DTS1 | 0.853 | | | |
| DTS2 | 0.879 | | | |
| DTS3 | 0.764 | | | |
| DTS4 | 0.771 | | | |
| Psychological resilience (PR) | | 0.916 | 0.915 | 0.644 |
| PR1 | 0.812 | | | |
| PR2 | 0.806 | | | |
| PR3 | 0.798 | | | |
| PR4 | 0.843 | | | |
| PR5 | 0.774 | | | |
| PR6 | 0.780 | | | |
| Readiness for digital transformation (RDT) | | 0.960 | 0.894 | 0.727 |
| RDT1 | 0.883 | | | |
| RDT2 | 0.880 | | | |
| RDT3 | 0.919 | | | |
| RDT4 | 0.856 | | | |
| RDT5 | 0.855 | | | |
| RDT6 | 0.774 | | | |
| RDT7 | 0.796 | | | |
| RDT8 | 0.900 | | | |
| RDT9 | 0.796 | | | |

Source(s): Authors' own work

4. Results

4.1 Validity test, correlation coefficient and common method bias test

Using AMOS 24.0, this study conducted a validity test and analyzed for common method bias. First, confirmatory factor analysis was performed, yielding five alternative models, as detailed in Table 3. The results showed that Model M5, which adopted a second-order factor structure for the RDT variable, met all the required fit indices ($\chi^2/df = 2.231 < 3$; CFI = 0.916, TLI = 0.907, IFI = 0.917, all exceeding 0.9; RMSEA = 0.066 < 0.08). Subsequently, based on

Table 3. Confirmatory factor analysis

| Model | Factors | χ^2 | <i>df</i> | χ^2/df | CFI | TLI | IFI | RMSEA |
|-------|---|----------|-----------|-------------|-------|-------|-------|-------|
| M1 | EID + TPD + DTL + DTS + PR + ER + CR + IR | 3833.856 | 495 | 7.745 | 0.523 | 0.492 | 0.526 | 0.154 |
| M2 | EID + TPD + DTL + DTS + PR, RDT(ER, CR, IR) | 3054.224 | 491 | 6.220 | 0.634 | 0.607 | 0.636 | 0.136 |
| M3 | EID, TPD, DTL, DTS + PR, ER + CR + IR | 1727.271 | 481 | 3.591 | 0.822 | 0.805 | 0.823 | 0.096 |
| M4 | EID, TPD, DTL, DTS, PR, RDT(ER + CR + IR) | 1693.684 | 479 | 3.536 | 0.827 | 0.809 | 0.828 | 0.094 |
| M5 | EID, TPD, DTL, DTS, PR, RDT(ER, CR, IR) | 1061.794 | 476 | 2.231 | 0.916 | 0.907 | 0.917 | 0.066 |

Note(s): EID = Employee involvement, TPD = Threat perception, DTL = Digital transformational leadership, DTS = Digital transformational self-efficacy, PR = Psychological resilience, RDT = Readiness for digital transformation, ER = Emotional readiness, CR = Cognitive readiness, IR = Intentional readiness

Source(s): Authors' own work

the connotative characteristics of the variables, we designed four competing models: Model M1 (all constructs combined), M2 (all antecedents combined), M3 (self-efficacy and psychological resilience combined), and M4 (RDT changed to a first-order factor). Through comparison, it was found that the Model M5 had the best fitting effect. Moreover, this model was consistent with the expected theoretical framework and was considered suitable for subsequent analysis.

The results of the correlation coefficients and discrimination validity are presented in Table 4. The correlation coefficients of employee involvement ($r = 0.673, p < 0.001$), threat perception of digital transformation ($r = -0.330, p < 0.001$), digital transformational leadership ($r = 0.631, p < 0.001$), digital transformational self-efficacy ($r = 0.702, p < 0.001$), and psychological resilience ($r = 0.461, p < 0.001$) with RDT were all statistically significant.

Subsequently, the validity of each construct was tested. On the one hand, according to Table 2, the average variance extracted (AVE) values of the variables range from 0.600 to 0.727, all of which are higher than the threshold of 0.5. Meanwhile, the standardized factor loading values of each item are higher than 0.6 (ranging from 0.654 to 0.919), indicating good convergent validity.

On the other hand, according to Table 4, we adopted two criteria, Fornell-Larcker and HTMT, to test the discriminant validity. (1) Using the Fornell-Larcker criterion, the square root of the AVE of each variable is higher than the correlation coefficient between it and other variables; (2) Using the HTMT criterion, the HTMT of each construct is lower than 0.85 (Henseler *et al.*, 2015). Both testing criteria indicate good discriminant validity (Ma *et al.*, 2025).

To address common method bias, the latent error variable control method was employed. This involved including a method factor in Model M5 (refer to Table 3). The addition of this method factor did not result in significant model improvement ($\chi^2/df = 2.215, CFI = 0.918, TLI = 0.908, IFI = 0.918, RMSEA = 0.065$), suggesting that common method bias was not a significant concern.

4.2 Results of SEM analysis

The SEM was constructed using AMOS 24.0. After taking gender, age, education, job position, tenure, and industry sector into account as control variables (Cetindamar *et al.*, 2021;

Table 4. Means, standard deviations (SD), correlation coefficients and discrimination validity

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | Mean | SD |
|------------------------|----------|-----------|----------|----------|----------|-------|-------|-------|
| <i>Fornell-Larcker</i> | | | | | | | | |
| EID | 0.830 | | | | | | 3.886 | 0.669 |
| TPD | 0.191*** | 0.818 | | | | | 3.236 | 0.880 |
| DTL | 0.631*** | -0.123* | 0.775 | | | | 3.587 | 0.774 |
| DTS | 0.614*** | -0.239*** | 0.579*** | 0.818 | | | 3.665 | 0.833 |
| PR | 0.376*** | -0.019 | 0.477*** | 0.393*** | 0.802 | | 3.211 | 1.029 |
| RDT | 0.673 | -0.330 | 0.631 | 0.702 | 0.461*** | 0.852 | 3.808 | 0.679 |
| <i>HTMT</i> | | | | | | | | |
| EID | 1.000 | | | | | | | |
| TPD | 0.213 | 1.000 | | | | | | |
| DTL | 0.705 | 0.140 | 1.000 | | | | | |
| DTS | 0.690 | 0.270 | 0.640 | 1.000 | | | | |
| PR | 0.415 | 0.061 | 0.525 | 0.432 | 1.000 | | | |
| RDT | 0.751 | 0.373 | 0.695 | 0.782 | 0.507 | 1.000 | | |

Note(s): In the Fornell-Larcker criterion, the off-diagonal values are correlation coefficients, while the diagonal values are the square roots of the AVE of each variable; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source(s): Authors' own work

Shah and Shah, 2010; Zhou and Shi, 2025), all fitting indicators surpass the recommended thresholds ($\chi^2/df = 1.973$, CFI = 0.916, TLI = 0.900, IFI = 0.917, RMSEA = 0.059). The industry sector comprises four categorical variables: manufacturing, transportation, information services, and other industries. The path analysis results are shown in Table 5 and Figure 3. Given the relatively substantial number of variables, covariance paths between variables were omitted from the diagram to ensure clarity.

Employee involvement has a significant positive effect on RDT ($\beta = 0.230$, $p = 0.001 < 0.01$), and hypothesis H1 is established. Threat perception of digital transformation has a significant negative effect on RDT ($\beta = -0.208$, $p < 0.001$), and hypothesis H2 is established. Digital transformational leadership significantly positively affects RDT ($\beta = 0.259$, $p < 0.001$), and hypothesis H3 is established. Digital transformational self-efficacy has a significant positive effect on RDT ($\beta = 0.468$, $p < 0.001$), and hypothesis H4 is established. The positive effect of psychological resilience on RDT reaches a significant level ($\beta = 0.148$, $p = 0.004 < 0.05$), and hypothesis H5 is established.

4.3 FsQCA analysis

Given that all constructs in this study were operationalized by means of the Likert scale, calibration adjustment is essential. In light of the paucity of mature theories and empirical knowledge, and drawing on established procedures in QCA research, we adopted the 5th, 50th, and 95th percentiles of the measured values as the calibration points for fully-out, cross-over, and fully-in membership, respectively (Ragin, 2008). This approach better reflects the characteristics of the actual data and avoids potential issues arising from the direct use of extreme values, which may be influenced by outliers. As a result, this method may provide increased robustness in calibration. The calibration points are presented in Table 6.

4.3.1 Necessity analysis. Necessary conditions represent the extent to which an antecedent is essential for achieving a specific outcome level. In accordance with the fsQCA method, if the consistency level of a certain antecedent exceeds 0.9, it can be regarded as this antecedent constituting a necessary condition for high or non-high level RDT (Schneider and Wagemann, 2012). The necessity analysis results based on fsQCA3.0 software revealed that the consistency levels of each antecedent are all below

Table 5. Test results of SEM

| Structural path | β | Standard error | Critical ratio | p | Result |
|---|---------|----------------|----------------|--------|------------|
| <i>Core variables</i> | | | | | |
| Employee involvement → RDT | 0.230 | 0.056 | 3.233 | 0.001 | Support |
| Threat perception of digital transformation → RDT | -0.208 | 0.027 | -4.284 | <0.001 | Support |
| Digital transformational leadership → RDT | 0.259 | 0.042 | 3.846 | <0.001 | Support |
| Digital transformational self-efficacy → RDT | 0.468 | 0.044 | 6.412 | <0.001 | Support |
| Psychological resilience → RDT | 0.148 | 0.026 | 2.868 | 0.004 | Support |
| <i>Control variables</i> | | | | | |
| Gender → RDT | 0.052 | 0.041 | 1.270 | 0.204 | Nonsupport |
| Age → RDT | 0.178 | 0.009 | 1.245 | 0.213 | Nonsupport |
| Education → RDT | -0.019 | 0.031 | -0.453 | 0.651 | Nonsupport |
| Job position → RDT | 0.076 | 0.022 | 1.701 | 0.089 | Nonsupport |
| Tenure → RDT | -0.235 | 0.010 | -1.643 | 0.100 | Nonsupport |
| Industry sector_1 → RDT | -0.106 | 0.050 | -2.430 | 0.015 | Support |

Note(s): Due to space limitations, only the test results of one category of the categorical variable industry sector are reported, where “Industry sector_1” refers to the manufacturing industry

Source(s): Authors’ own work

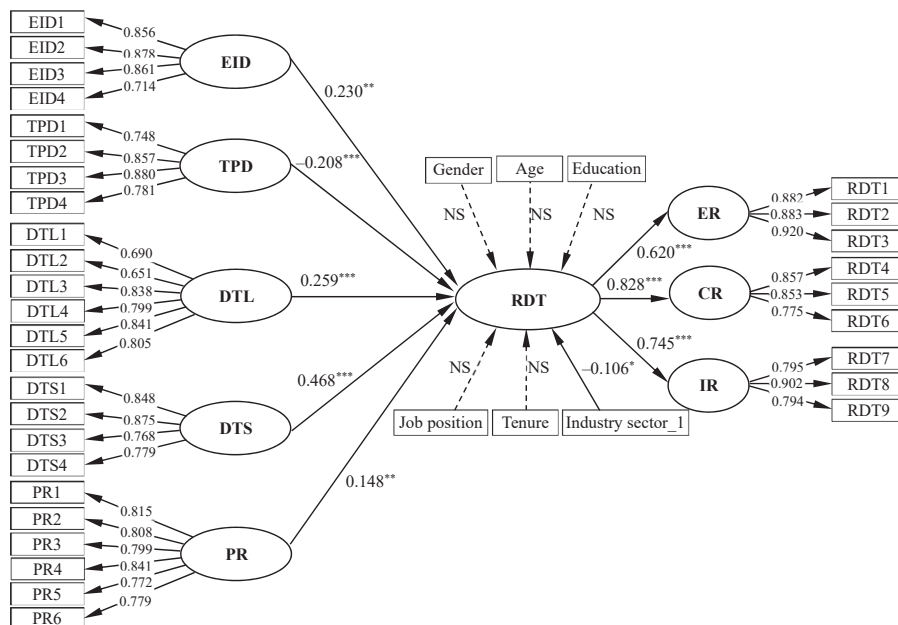


Figure 3. AMOS-generated structural path diagrams. **Note(s):** * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. **Source(s):** Authors' own work

Table 6. Fuzzy set calibration points of constructs

| Sets | Fuzzy set calibration points | | |
|---|------------------------------|------------|----------|
| | Fully-out | Cross-over | Fully-in |
| Employee involvement | 2.750 | 4.000 | 5.000 |
| Threat perception of digital transformation | 2.000 | 3.250 | 4.750 |
| Digital transformational leadership | 2.167 | 3.667 | 5.000 |
| Digital transformational self-efficacy | 2.000 | 3.750 | 5.000 |
| Psychological resilience | 1.333 | 3.333 | 4.833 |
| Readiness for digital transformation | 2.256 | 3.889 | 4.778 |

Source(s): Authors' own work

0.9 (ranging from 0.566 to 0.867), indicating that no single antecedent is a necessary condition for a high or non-high level of RDT.

4.3.2 Sufficiency analysis. Truth table analyses were performed using fsQCA3.0. Prior to the analysis, three threshold standards were set: (1) The original consistency threshold was fixed at 0.80, consistent with the common standards in QCA research (Rihoux and Ragin, 2009). (2) Given the considerable number of cases (over 100), the case frequency threshold was set at 2, ensuring that at least 75% of cases were incorporated in the analysis (Rihoux and Ragin, 2009). (3) The PRI consistency threshold was set to 0.70, in accordance with the recommendations of Du and Kim (2021).

In the absence of consistent conclusions or theoretical expectations, the analysis supposed that the presence or absence of any antecedent could impact RDT outcomes. The fsQCA software generates three solutions of varying complexities: the complex solution, the intermediate solution, and the parsimonious solution. The intermediate solution was selected for reporting due to its equilibrium between theoretical meaningfulness and parsimony. The antecedent configurations are presented in Table 7. Core conditions emerge in both the intermediate and parsimonious solutions, while peripheral conditions only surface in the intermediate solution. Notably, digital transformational leadership was persistently present in the high RDT group and absent in the non-high RDT group, highlighting its crucial role in enhancing RDT.

(1) Configuration results of high level RDT

The truth table analysis focused on high level RDT as the outcome, yielding three antecedent configurations with consistency scores above 0.9. The overall solution consistency was 0.929, and the overall solution coverage reached 0.704, exceeding the standard thresholds of 0.8 for consistency and 0.5 for coverage. Based on the core and peripheral conditions of each configuration, the pathways to high RDT were named as follows: the “Organizational empowerment – Threat mitigation” model (HL1), the “Organizational empowerment - Self-efficacy” model (HL2), and the “Leadership guidance – Confidence and tenacity” model (HL3).

Configuration HL1 (EID*~TPD*DTL → RDT) shows that a high level of RDT results from a configuration with employee involvement and absence of threat perception as core conditions, complemented by digital transformational leadership as a peripheral condition. On one hand, digital transformational leadership and employee involvement foster organizational empowerment in RDT by “strengthening subjective norms” and “optimizing change evaluation,” respectively. Specifically, digital transformational leadership provides clear directional guidance and essential resource support to facilitate change adaptation (Lin, 2024). Employee involvement, in turn, enables employees to be involved in strategic decision-making and the formulation of digital transformation plans (Ullrich et al., 2023), thereby endowing employees with experiential knowledge to accurately appraise the opportunities and challenges of digital transformation. On the other hand, the non-high threat perception reflects reduced employee anxiety regarding risks such as job substitution, thereby sustaining positive affect, cognitive outlook, and willingness to engage in digital transformation, which can be

Table 7. Results of configuration analysis

| Antecedents | High level RDT | | | Non- high level RDT | |
|---|----------------|-------|-------|---------------------|-------|
| | HL1 | HL2 | HL3 | NL1 | NL2 |
| Employee involvement | ● | ● | | ⊗ | ⊗ |
| Threat perception of digital transformation | ⊗ | | ⊗ | | ● |
| Digital transformational leadership | ● | ● | ● | ⊗ | ⊗ |
| Digital transformational self-efficacy | | ● | ● | ⊗ | ⊗ |
| Psychological resilience | | ● | ● | ⊗ | |
| Consistency | 0.953 | 0.943 | 0.964 | 0.921 | 0.942 |
| Raw coverage | 0.525 | 0.624 | 0.454 | 0.601 | 0.564 |
| Unique coverage | 0.040 | 0.140 | 0.039 | 0.144 | 0.077 |
| Overall solution consistency | 0.929 | | | 0.913 | |
| Overall solution coverage | 0.704 | | | 0.678 | |

Note(s): ● = core condition present, ● = peripheral condition present, ⊗ = core condition absent, ⊗ = peripheral condition absent, blank = presence or absence of causal condition

Source(s): Authors’ own work

conceptualized as “enhancing personal valence.” In accordance with the TPB theory, it is proposed that subjective norms and behavioral attitudes interact and jointly exert an influence on the behavioral outcome (Ajzen, 1991). Hence, the synergistic alignment of these antecedents exerts a potent empowerment effect on RDT.

Configuration HL2 (EID*DTL*DTS → RDT) suggests that a configuration with high employee involvement, digital transformational leadership, and digital transformational self-efficacy as core conditions can lead to a high level of RDT. Similar to HL1, configuration HL2 also emphasizes that digital transformational leadership and employee involvement enhance change awareness, participation and adaptability. It posits that organizations should furnish adequate resource empowerment to employees to mitigate the pressures associated with digital technology adoption (Ertiö *et al.*, 2024). Alternatively, this configuration highlights the role of self-efficacy in surmounting the challenges of digital transformation to improve readiness among employees. Empirical evidence suggests that the synergistic interaction between high self-efficacy and positive leadership can potentiate the empowerment effects on employees (Chen and Kouhsari, 2025). Configuration HL2 aligns with these findings and validates the triadic interactive empowerment effect of behavioral attitude factors (employee involvement), subjective norm factors (digital transformational leadership), and perceived behavioral control factors (digital transformational self-efficacy) on enhancing RDT, as conceptualized by the TPB.

Configuration HL3 (~TPD*DTL*DTS*PR → RDT) indicates that a configuration with high digital transformational leadership, digital transformational self-efficacy, and psychological resilience as core conditions, complemented by a non-high threat perception as a peripheral condition, facilitates the enhancement of RDT. In contrast to HL1 and HL2, configuration HL3 does not necessitate employee involvement but instead emphasizes the roles of digital transformational leadership in vision planning and change leadership. Moreover, this configuration places significant emphasis on employees’ positive psychological capital. Specifically, digital transformational leadership functions as a subjective normative factor, enhancing RDT by offering external motivation for digital business practices through encouragement and emotional alignment. Digital transformational self-efficacy and psychological resilience, respectively, represent the “self-belief” and “adversity recovery” attributes of employees confronting digital transformation (Durst *et al.*, 2023), thereby constituting internal drivers of RDT. The non-high level of threat perception, as a peripheral condition, reflects employees’ positive personal valence toward digital transformation, enabling them to alleviate the stress of change-related losses and threats, thereby maintaining a positive stance toward digital transformation. The confluence of these elements increases the likelihood of employees sustaining a high level of RDT.

(2) Configuration results of non-high level RDT

To investigate the conditions leading to a non-high level of RDT, a configuration analysis was conducted. This analysis yielded two sufficient antecedent configurations, each with a consistency exceeding 0.9. The overall consistency for these configurations was 0.913, and the overall coverage was 0.678, which satisfies the criteria for sufficient conditions.

Configuration NL1 (~EID*~DTL*~DTS*~PR → ~RDT) suggests that when an organization lacks digital transformational leadership and does not involve employees in digital transformation, coupled with employees’ deficient digital transformational self-efficacy and psychological resilience, achieving a high level of RDT becomes challenging. In light of the constituents of the antecedents, Configuration NL1 is designated as the “Organizational incapacity – Lack of literacy” model. Similarly, configuration NL2 (~EID*TPD*~DTL*~DTS → ~RDT) indicates that in the absence of high-level digital transformational leadership and employee involvement, and where employees face significant transformation threats and have low self-efficacy, attaining a high level of RDT is extremely difficult. Reflecting the nature of the antecedents, Configuration NL2 is termed the “Organizational incapacity – Threat pressure” model.

4.3.3 *Robustness analysis.* A robustness test was conducted on the configuration results (Schneider and Wagemann, 2012). This involved three test scenarios: (1) Elevating the PRI consistency threshold from 0.70 to 0.80; (2) Raising the case frequency threshold from 2 to 3; (3) Increasing the original consistency threshold from 0.80 to 0.90. If a distinct subset relationship is identified between the configuration results of the robustness test and the original one, the results can be considered robust. The results of adjusting the PRI consistency threshold are presented in Table 8 as an example. The robustness test revealed that the configuration outcomes following the threshold modification were all subsets of the configurations presented in Table 7, thereby confirming the robustness of the findings.

5. Discussion and implications

5.1 Discussion

This study employed the SEM approach to explore the net effects of the antecedents of RDT, and all hypotheses were verified. First, employee involvement has a positive influence on RDT, suggesting that guiding employees’ participation is an effective strategy for optimizing their change attitudes, which validates the theoretical framework of the TPB regarding the effects of positive attitudes (Ajzen, 1991). Applying the TPB to analyze employees’ psychological and behavioral responses during digital transformation extends the theory’s application scope. Additionally, our results partially support the findings of Selimovic et al. (2021). In contrast, their study centered on employees’ intentions to support digital transformation, and we extend this line of research by specifically examining how employee involvement enhances RDT.

Second, threat perception decreases RDT. Although there is no direct related literature, some scholars have confirmed that the threat perception of digital technologies will increase insecurity (Leong et al., 2025), and it may also enhance employees’ stress and resistance (Bausch et al., 2024). Relevant literature conclusions support the rationality of our study results. Moreover, the TPB points out that the negative value assigned to the attributes of things will form negative attitude and drive the individual to develop an avoidance tendency (Choe, 2025). Our study supports this view, arguing that threat perception such as job replacement can measure employees’ negative personal valence and hinder the improvement of their RDT.

Table 8. Robustness test of configuration results after adjusting the PRI consistency threshold

| Antecedents | High level RDT | | Non-high level RDT |
|---|------------------|------------------|--------------------|
| | HL1 ^R | HL2 ^R | NL1 ^R |
| Employee involvement | ● | ● | ⊗ |
| Threat perception of digital transformation | ⊗ | | ● |
| Digital transformational leadership | ● | ● | ⊗ |
| Digital transformational self-efficacy | | ● | ⊗ |
| Psychological resilience | | ● | ⊗ |
| Consistency | 0.953 | 0.961 | 0.957 |
| Raw coverage | 0.525 | 0.534 | 0.487 |
| Unique coverage | 0.110 | 0.119 | 0.487 |
| Overall solution consistency | 0.943 | | 0.957 |
| Overall solution coverage | 0.644 | | 0.487 |

Note(s): ● = core condition present, ● = peripheral condition present, ⊗ = core condition absent, ⊗ = peripheral condition absent, blank = presence or absence of causal condition

Source(s): Authors’ own work

Third, the positive impact of digital transformational leadership on change attitudes has been confirmed. Conforming to related academic works (Braojos *et al.*, 2024), we argue that digital transformational leadership can, through means such as digital vision construction, establish subjective norm that guide employees to enhance RDT, thereby enabling adaptation to the technological and change pressures (Ertiö *et al.*, 2024). This research has elaborated on the positive role of digital transformational leadership in shaping employees' normative beliefs, enriching the theoretical framework of the subjective norm dimension factors in the TPB (Ajzen, 1991).

Fourth, while extant literature confirms self-efficacy's role in organizational change (Kromah *et al.*, 2024; Yang *et al.*, 2024), this study reveals the distinctive impact of digital transformational self-efficacy on RDT. We break through the traditional change context and focus on the unique self-efficacy construct in the digital context (Malodia *et al.*, 2023). The reason is that digital transformation radically disrupts workflows, necessitating efficacy to navigate dual pressures from technological turbulence and structural change. This conclusion extends the TPB by demonstrating that digital transformational self-efficacy, which manifests in the forms of emotional reinforcement, cognitive enablement, and behavioral activation, strengthens control beliefs to enhance RDT.

Fifth, the positive relationship between psychological resilience and RDT has been verified. The influence of resilience when employees encounter challenges has been affirmed by previous research (Muduli and Choudhury, 2025). Regrettably, a majority of prior studies concentrate on the buffering function of resilience against general work stress (Zhu *et al.*, 2024), without uncovering how it enhances RDT under digital disruption. The enhancement of RDT is premised on employees' adaptation to change crises, and resilience helps prevent employees from being overwhelmed by stress during the digital transformation. This study expands the antecedent framework of the TPB by verifying the role of resilience in digital transformation. By positioning resilience as a factor in the perceived behavioral control dimension that drives RDT, we verify how control beliefs with universal functional characteristics enhance RDT.

The fsQCA approach reveals that none of the antecedents constitutes a necessary condition for RDT. This conclusion is not inconsistent with the results of the net effect test, as necessary conditions focus on the antecedents that are indispensable for bringing about the result (Dul, 2024). Although all five antecedents have a significant impact on RDT, they are not indispensable. The results of the configurational analysis further corroborate this finding. Take configuration HL1 as an example. When employee involvement and digital transformational leadership are at a high level, and threat perception is not at a high level, RDT can be fully achieved, without strict requirements for self-efficacy and resilience.

According to configuration theory, there are complex causal relationships among the elements constituting the organizational environment (Ragin, 2008). Based on the fsQCA method, this study identifies three sufficient configurations that lead to high RDT and two sufficient configurations that result in non-high RDT. Taking configuration HL2 as an example, employee involvement shapes a positive attitude, digital transformational leadership imparts subjective norms, and digital transformational self-efficacy provides control beliefs. The coordinated interaction of these three types of elements promotes the enhancement of RDT, which also validates the theoretical validity of the TPB framework (Ajzen, 1991).

The enhancement of employees' motivation for change requires various beliefs such as efficacy, principal support, and valence. However, not every belief is equally important (Armenakis and Harris, 2009). The nonlinear relationships among the antecedents have prompted some scholars to adopt configuration theory to explore the antecedent mechanisms of change attitudes (Dragan *et al.*, 2024; Zhou and Shi, 2025). The configurations obtained in this study, from the perspective of employees' RDT, verify the rationality of using the configurational approach to study the antecedent mechanisms of change attitudes.

5.2 Theoretical implications

Firstly, based on the TPB, this study constructed a linkage model of the multi-dimensional antecedents of employees' RDT. The extant literature examines the determinants of RDT at an organizational level, underscoring the pivotal roles of organization, technology, and human capital in bolstering RDT (Tangwaragorn *et al.*, 2024). In contrast, the theoretical model proposed herein focuses on the psychological mechanisms of micro-individuals within the digital economy, particularly employees' attitudes and willingness, offering a new lens to understand their emotional responses, cognitive attitudes, and behavioral decisions during digital transformation. By investigating the net effects and matching effects between antecedents such as employee involvement, threat perception, digital transformational leadership, digital transformational self-efficacy, and psychological resilience, and employees' RDT, this study aims to enrich the theoretical framework of RDT antecedents and simultaneously addresses the paucity of research on the micro perspective of organizational change readiness in the digital era (David *et al.*, 2024).

Secondly, the study explored the net effects and necessary relationships between each antecedent and RDT. The findings indicate that employee involvement, digital transformational leadership, digital transformational self-efficacy, and psychological resilience all serve to enhance RDT, whereas threat perception of digital transformation significantly diminishes RDT. However, it was also observed that these factors do not constitute a necessary condition for RDT. These two findings are not mutually exclusive. The net effect is the aggregate impact of a given antecedent on the outcome after considering all relevant factors, while the necessary relationship implies the "indispensability" of a particular antecedent for the occurrence of an outcome (Dul, 2024). In this research, while no single condition is essential for RDT, its interplay with other conditions can promote or inhibit RDT. This challenges the conventional assumption of the sole influence of an antecedent on behavioral intention, and provides a fresh theoretical foundation for comprehending complex behavioral decisions. Although some scholars have attended to employees' emotional, cognitive, and behavioral reactions to digital transformation (Liu *et al.*, 2024), most studies rely on traditional regression analyses (Weber *et al.*, 2022), with scant attention to necessary conditions exerting a "veto" effect. This study furnishes new empirical evidence for a granular understanding of why employees may accept or resist digital transformation.

Finally, this study proposed several equivalent configurations that precipitate a high level of employees' RDT. Most existing research examines the direct or interactive effects between antecedents and employees' traditional change attitudes (Bouckennooghe *et al.*, 2021), with scant attention to the antecedent mechanisms of RDT (Klein *et al.*, 2024), and even less research investigating the matching relationship between multi-dimensional antecedents and RDT. Departing from traditional net effect research, this study's exploration of the configurational effect of RDT serves to enrich the scholarly understanding of the antecedent mechanisms of employees' change attitudes and validates the applicability of employing the TPB theory within the domain of change management (Soffer *et al.*, 2023). Additionally, the study identified two antecedent configurations conducive to non-high level RDT, revealing an asymmetric causal relationship in the motivational underpinnings of high versus non-high levels of employees' RDT. The resultant conclusions not only enrich the theoretical corpus of change readiness from a micro-perspective but also provide practical and actionable insights for enterprises to facilitate a smooth digital transformation process.

5.3 Managerial implications

From an organizational perspective, both the cultivation of digital transformation leadership and the active involvement of employees in the transformation process are significant. Organizations should establish a dedicated digital transformation leadership team to articulate a clear digital strategy and implementation plan. Regular digital leadership training programs should be implemented to strengthen managers' leadership skills related to digital technology

and transformation, thereby enabling them to guide the transformation effectively. Concurrently, to enhance employees' digital competencies and ensure their engagement, appropriate training and preparatory activities should be provided. Specifically, organizations can foster employee participation through digital transformation-themed initiatives, such as innovation competitions and suggestion schemes (Ulrich *et al.*, 2023).

From the employee perspective, enterprises should focus on developing digital transformational self-efficacy and psychological resilience. Digital transformational self-efficacy enhances employees' confidence in addressing change challenges, while psychological resilience helps maintain composure and rationality amid change-related dilemmas. Managers can take measures like digital skills training, and establishing change role models to enhance employees' self-efficacy in handling digital transformation tasks (Ye *et al.*, 2024). Furthermore, the organization should tackle change-related anxiety, offer stress management training, and focus on team psychological development to foster resilience among employees in digital transformation, thus enhancing their adaptability and willingness to engage.

Regarding the nature of the change, enterprises must proactively mitigate potential digital fears and alleviate employees' concerns about the risks of digital transformation. A human-centered digital transformation plan should be devised to ensure employees' needs and emotional experiences are considered throughout the process, demonstrating the organization's empathy and reducing resistance arising from change-related threats (Weber *et al.*, 2022). Furthermore, a transparent communication strategy coupled with flexible promotion activities should delineate the goals, updates, and expected results of digital transformation. Sharing success stories can also ease employees' change concerns.

Finally, enterprises should consider the matching relationship among conditions. Organizations can adapt change management strategies based on their specific context to optimize employees' RDT. For instance, adopting the "Organizational empowerment – Threat mitigation" model (Configuration HL1), enterprises can integrate "digital transformational leadership development" with "employee involvement in transformation initiatives," driving RDT through both leadership guidance and employee activation. Simultaneously, organizations should strengthen self-assessment and response mechanisms to address perceptions of change threats, alleviating concerns about digital transformation. Conversely, if an organization has difficulties in achieving high levels of digital transformational leadership or employee involvement in the short term, it should focus on building employees' self-efficacy or resilience to prevent a decline in RDT and to reduce internal resistance to digital transformation. This inference is drawn from Configuration NL1.

6. Conclusions, limitations and future research directions

Grounded in the TPB, this study employed SEM and fsQCA to explore the net effects and equifinal configurations of the antecedents including employee involvement, threat perception, digital transformational leadership, digital transformational self-efficacy, and psychological resilience on employees' RDT. We go beyond simplistic causal models and recognize the complex interaction of attitudes, subjective norms, and perceived behavioral control in shaping RDT (Ajzen, 1991). The SEM analysis indicated that employee involvement, digital transformational leadership, digital transformational self-efficacy, and psychological resilience are significant facilitators of RDT, while threat perception has a significant inhibitory effect. These findings extend existing literature, confirming the importance of these factors in fostering a positive attitude towards digital transformation (Ertiö *et al.*, 2024; Selimovic *et al.*, 2021). Importantly, they also underline the need to address employee concerns and anxieties related to organizational change (Li and Liu, 2025).

The fsQCA analysis revealed three configurations that result in high RDT: "Organizational empowerment – Threat mitigation," "Organizational empowerment – Self-efficacy," and "Leadership guidance – Confidence and tenacity." Additionally, it identified two

configurations associated with non-high RDT: “Organizational incapacity – Lack of literacy” and “Organizational incapacity – Threat pressure.” These findings illustrate that multiple pathways can result in the same outcome, thereby challenging the assumption of a one-size-fits-all approach to RDT management. This underscores the significance of context and the necessity for organizations to customize their strategies according to their unique strengths and challenges. While no single antecedent was found to be a necessary condition for RDT, digital transformational leadership played a pivotal role across various configurations. This highlights the importance of effective leadership in guiding and supporting employees through the complexities of digital transformation (Palmucci *et al.*, 2025).

This study demonstrated the synergy of integrating SEM and fsQCA to deconstruct the complexity of the antecedents of RDT. This integration leverages the complementarity of these methods, aligning with cutting-edge paradigms in organizational behavior (Zhou and Shi, 2025). SEM quantifies net effects of TPB-derived constructs, and fsQCA reveals equifinal configurations where RDT emerges from distinct matching combinations of environmental and psychological resources. The absence of necessary conditions and the presence of asymmetric paths for high versus non-high RDT underscore the nonlinear, context-dependent nature of behavioral transitions. In summary, these set-theoretic insights transcend linear paradigms, offering a methodological contribution via comparative interpretation and integrative analysis of multiple methods (Bergh *et al.*, 2022).

This research also has certain limitations. First, limited by sample diversity, this study constructed an antecedent linkage model of employees’ RDT within the framework of the TPB. Future research could expand upon this by incorporating additional theoretical perspectives, such as cognitive adaptation theory, and the conservation of resources theory, to explore context-specific configurations. Second, the research team carefully selected employee samples from enterprises undergoing digital transformation across diverse industries and regions. Nevertheless, the dynamic market environment characteristic of the digital economy eras necessitates constant vigilance for emerging digital phenomena. Researchers should continually expand their investigative efforts to validate the generalizability of the configurational patterns identified in this study.

Author contribution

Xi-xi Zhang: Data curation, Writing-Reviewing.

Xing-lin Hao: Conceptualization, Methodology, Software, Writing-Original draft preparation and Editing.

Xue-rui Jia: Data curation.

Research data

The datasets generated and analyzed during the current study are not publicly available due the fact that they constitute an excerpt of research in progress but are available from the corresponding author on reasonable request.

Notes

1. <https://www.bcg.com/news/21december2021-why-successful-digital-transformations-are-rare>

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