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Fostering Digital Excellence: A Multidimensional Exploration of the Collective Effects of Technological Adaptability, Employee Competitiveness, and Employee Dynamic Capabilities on Employee Digital Performance in Chinese SMEs

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Abstract

This study is grounded in a specific Eastern cultural region, undertaking a multidimensional exploration. We meticulously examined the intricate interplay between employee competitive

attitudes (ECA) and behaviors (ECB), employee dynamic capability (EDC), and Competitive climate (CC), converging these factors to redefine the contours of Employee Digital Performance (EDP). The survey data for this study were collected from SMEs in four Chinese provinces: Shanghai, Guizhou, Guangdong, and Anhui. The analysis was conducted utilizing CB-SEM (AMOS) to analyze the newly conceptualized framework. The research findings unveil a profound reality: in the digital era, Technological Adaptability (TA), Employee Competitive Attitudes, Employee Competitive Behaviors, and Employee Dynamic Capabilities all exert positive influences on Employee Digital Performance. The study indicates that technological adaptability, as a forward variable of employee competitive attitude and employee competitive behavior, positively influences employees' competitive attitudes and behaviors. Employees possessing competitive attitudes and behaviors enhance their dynamic capabilities, thereby promoting employee digital performance. Furthermore, the research indicates that the Competitive Climate moderates Employee Competitive Behaviors, and Employee Competitive Attitudes drive Employee Dynamic Capabilities, enhancing Employee Digital Performance. In the process of Chinese SMEs striving for digital advantages, this research provides a distinctive perspective. It offers actionable insights into harnessing employees' traits and capabilities within the continually evolving digital ecosystem.

Keywords: Employee Competitive Attitude, Employee Competitive Behaviors, Competitive Climate, Employee digital Performance, SMEs, Digital transformation

1. Introduction

In the age of globalization and international commerce, technology is essential for market competitiveness. In several countries, the technological revolution has presented small business owners with substantial challenges. Technology also helps SMEs become more competitive and sustainable. To help SMEs develop sustainably, a country's technology environment must be considered(Das et al., 2020). In the present digital milieu characterized by revolutionary digital technologies, Chinese SMEs find themselves at a pivotal moment where competition and innovation intricately interweave (Rupeika-Apoga et al., 2022). Digital technology is changing job skills and capacities, forcing workers to adapt. Recent research on digital transformation and employee effectiveness has focused on commercial and strategic issues with only modest integration of employee concerns (Trenerry et al., 2021).

Nevertheless, the organizational digital transformation propelled by big data and artificial intelligence underscores the paramount importance of employees possessing digital skills for corporate success (Rauch et al., 2020). Moreover, the emerging digital work environment is rendering digital work as the new norm for individuals within the organizational framework (Wibowo et al., 2022). Research suggests that the features of digital work are anticipated to enhance employee performance within organizations (Richter, 2020). An increasing number of enterprises are leveraging these digital tools to facilitate communication, collaboration, and knowledge sharing among employees. Currently, research indicates that in China, over 80% of employees utilize digital technology for work, especially in recent years where frequent unexpected events have expedited the adoption of technology. Consequently, technology adoption is gradually emerging as a potential means for enterprises to gain a competitive advantage (Zhang et al., 2022). The adoption of digital technology is a potent tool for organizations to either triumph over or be defeated by their competitors. Similarly, for the sake of competition, organizations must ensure that their employees are adept with the latest technologies to adapt to the ever-evolving digital technology landscape (Kashefi et al., 2015; Rubel et al., 2020). In other words, organizations need to have employees with technological adaptability to maintain competitiveness.

Moreover, organizational digital transformation requires employee active engagement in digital transformation (employee behavior), such as those who willingly and proactively contribute insights to digital participation initiatives (Rubel et al., 2023). Primarily, the active participation of employees (employee behavior) leads to a better design of the work (Richter et al., 2018). Nevertheless, such commitments have yet to be fully realized, this is due to constraints on individual behavior imposed by the use of digital technologies and the intricate interactions among individuals within the organization (De et al., 2020). Moreover, the efficacy of advanced technology adoption is compounded by a shortage of skills in the labor market, where the mismatch between employees' digital skills and organizational needs stands as one of the most pressing challenges faced by current organizations. Leading industry reports predict that the skill gap will widen for most companies in the coming years, with employers seeking employees with critical thinking, analytical, problem-solving, self-management, adaptability, and resilience skills (Taylor et al., 2022; McKinsey, 2021).

Therefore, the relationship between technological adaptability and the attitudes and behaviors of employees is crucial for organizational development (Rubel et al., 2023). For practitioners, a significant question revolves around whether the attitudes and behaviors of employees will undergo substantial changes due to technological transformations. If so, the extent of these employees' adaptability to technology becomes paramount for the organization to achieve long-term competitive advantages (Rubel et al., 2020).

Furthermore, digital transformation presents organizations with unprecedented challenges and opportunities, compelling SMEs to reevaluate their strategies, particularly regarding employees achieving work performance through digital technology (Shao et al., 2022). Specifically, the proficient utilization of digital technologies by employees to achieve job performance—referred to as digital performance—has been acknowledged as one of the most pivotal factors in successful digital transformation (Nambisan, 2017; Radziwill, 2020). Therefore, in the digital era, employee performance has gradually transformed into their digital performance (Shao et al., 2022; Zhang et al., 2022b). Moreover, the concept of employee digital performance was first introduced by scholars in 2022. They delineated employees' performance in the digital realm into two interconnected dimensions: digitally driven task performance and innovation performance. Digitally driven task performance refers to employees efficiently completing routine and repetitive tasks using digital technologies, while digital innovation performance pertains to employees leveraging digital technologies to foster innovation while accomplishing tasks (Shao et al., 2022).

First, past research indicates that senior management support, with a digital-driven culture as a mediator, and transformational leadership, with employee self-efficacy as a mediator, significantly impact employees' digital performance. Their study consolidates and extends the literature on management support for technological applications, advancing information systems leadership theory into the digital environment (Shao et al., 2022). In the same year, Zhang et al. (2022) empirically demonstrated that various adaptive behaviors of employees after the use of digital technologies have a significant impact on the later use behaviors on employee digital performance. Moreover, user adaptation is a prerequisite for influencing the post-adoption use of digital technologies (Zhang et al., 2022b). However, there is still a gap in current academic research on how organizations can use digital technologies to optimize employee attitudes and behaviours to achieve effective paths to digital employee performance (Shao et al., 2022; Zhang et al., 2022). Past research suggests that high-involvement human resource management practices, including information sharing, managerial support, employee involvement, relevant recognition, and training, can accelerate employees' adaptability to technology (Rubel et al., 2020). There is currently a research gap in exploring the relationship between technological adaptability and employee attitudes and behaviors. Therefore, the first objective of this study is to investigate the Impact of Technological adaptability on employee attitudes and behaviors.

Second, the rapid development of technology has determined the market instability. In the past two years, numerous scholars have argued that in a dynamically changing market, the key variable for organizations to gain a competitive advantage is employee dynamic capabilities (Al Wali et al., 2023; Bieńkowska et al., 2021; Bieńkowska & Tworek, 2020;

Eikelenboom & de Jong, 2019; Tworek et al., 2023; Wali et al., 2020). Employee dynamic capabilities are rooted in the DCT. In 2020, employee dynamic capabilities were first defined as the ability to integrate, develop, and adjust employees to cope with the rapidly changing environment directly impacting workplace task execution. Employee Dynamic Capabilities encompass both the flexibility to adapt and address current challenges and the ability to continuously improve work processes within specific job roles over the long term (Bieńkowska & Tworek, 2020).

In 2017, Fainshmidt and Frazier constructed a research framework on dynamic capabilities for achieving organizational competitive advantage. Firstly, the organizational climate shapes the attitudes, behaviors, and interpersonal relationship patterns among organizational members. It is posited that the organizational cliamte serves as a driving force between the attitude and behavior of employees and dynamic capabilities (Fainshmidt & Frazier, 2017). Specifically, from the perspectives of social exchange and social information processing, the organizational climate facilitates adaptation and coordination among organizational members, thereby enhancing the firm's sensing, seizing, and reconfiguring capabilities, leading to the organization gaining sustained competitive advantage. Empirical evidence also demonstrates a direct relationship between the trust climate and competitive advantage. Their research enhances the understanding of the antecedents of dynamic capabilities by emphasizing the importance of the organizational climate as a social foundation for dynamic capabilities and competitive advantage (Fainshmidt & Frazier, 2017). This indicates that employees with positive attitudes and behaviors will enhance the dynamic capabilities of employees. However, exploring the relationship between employee attitudes and behaviors and employee dynamic capabilities remains a gap in current research. Therefore, the second and third research objectives of this study are to explore the influence of employee attitudes and behaviors on employee dynamic capabilities and examine the moderating role of the work environment on employee attitudes, behaviors, and employee dynamic capabilities.

Finally, while scholars emphasize that employee dynamic capabilities play a more significant role in the dynamic market compared to variables related to employee attitudes and behaviors (Bieńkowska et al., 2021; Bieńkowska & Tworek, 2020; Tworek et al., 2023). However, few scholars have applied employee dynamic capabilities to the digital market, studying its impact on employee digital performance (Phan et al., 2022). This study attempts to fill the gaps in the above research. The fourth research objective is to conduct a comparative analysis of the differential impact of employee attitudes and behaviors versus employee dynamic capabilities on employee performance. Subsequently, this study elaborates in detail on the specific objectives rooted in the investigation of a particular cultural region in China. Moreover, the study provides a detailed description of the data and analysis used to test our hypotheses, followed by the empirical results of the study. Finally, we discuss the significance and limitations of our research, offering several directions for future exploration.

Research Question 1: Can technological adaptability serve as an antecedent to the attitudes and behaviors of employees?

To comprehensively address this research question, this study focuses on the specific cultural

context of China, incorporating the competitive attitudes and behaviors of employees. This is because Confucianism is a fundamental cultural value in East Asian countries such as China, Japan, and South Korea, and competition is a crucial variable influencing economic growth in Asian nations and establishing a culture that promotes individual diligence and enhances corporate productivity (Yang, 2022). Moreover, empirical studies suggest that, at least in East Asia, employees within organizations tend to engage in competition and believe that competition can enhance organizational productivity. For example, the Japanese perceive competition as a means of self-improvement, Canadians view it as a way to achieve goals, and Hungarians see it as a selection process (King et al., 2012). Yang (2022) conducted a survey on individuals aged between 18 and 64 in China, South Korea, and the Caucasus region. This study was conducted following ethical guidelines approved by the Human Research Ethics Committee. Empirical results indicate that individuals from East Asian countries (China and South Korea) are more inclined to compete within organizations. Secondly, substituting employee attitudes and behavior variables with employee competitive attitudes and competitive behaviors is primarily because any social science research divorced from the specific cultural context of a region would lose its significance (Toney et al., 2003). Wang et al. (2018) defined competitive behavior as acts people do to compete for resources or outperform others in work or personal settings. Therefore, incorporating employee competitive attitudes and behaviors into this study aligns more closely with objective reality. In the context of technological adaptability, technological adaptation is defined as the behavior of assessing the effective acceptance and utilization of technology by employees within an organization (Rubel et al., 2017). Employees within the organization are willing to accept, adapt, and use it. This is because the organization believes that effective technological adaptation and the application of new knowledge can ultimately enhance the competitiveness of employees, leading to a change in their attitudes and behaviors (Bala & Venkatesh, 2016). Moreover, organizations with good technological adaptability contribute to employees' willingness to use digital technology and enhance employee attitudes (job satisfaction) (Charoensukmongkol, 2014) and employee behavior (self-efficacy) (Zhang et al., 2022b). However, there are still discrepancies in the current research regarding the impact of technological adaptability on employee competitive attitudes and behaviors. Therefore, the first objective is to explore the influence of technological adaptability on employee competitive attitudes and employee competitive behaviors.

Research Question 2: Can employees with competitive attitudes and behaviors drive employee dynamic capabilities and enhance employee digital performance?

SMEs must possess resources that provide a competitive advantage to achieve sustained competitive advantage (Barney, 2001). The study has demonstrated that organizations with core resources enabling sustained competitive advantage can drive dynamic capabilities and enhance performance (Rodrigues et al., 2021). Scholars have validated the positive impact of DCT on performance based on the RBV. Through empirical evidence, they have confirmed that DCT serves as a mediating variable between RBV and the performance of SMEs. To clarify, the DCT has evolved as an expansion of the RBV (Rodrigues et al., 2021). Furthermore, human capital, referring to the existing knowledge and skills within the

organization, positively influences the development of DCT, including adaptability to digital technology, learning ability, and integration capability (Nieves & Haller, 2014).

Moreover, concerning the variables of employee competitive attitudes and behaviors, from the standpoint of finite resources, competition can be characterized as the phenomenon wherein individuals or organizations strive to obtain the same limited resources or incentives (Wang et al., 2018). Additionally, empirical evidence has demonstrated that possessing competitive attitudes and behaviors as part of an organization's human capital has a positive impact on dynamic capabilities (Maier et al., 2019). Therefore, SMEs must adopt a responsive posture that can quickly adapt to these changes (Scuotto et al., 2021). Moreover, many authors argue that dynamic capabilities are a necessary condition for gaining sustainable competitive advantage (Pisano, 2017; Teece, 2007a). Eisenhardt and Martin emphasize that dynamic capabilities can be understood as the processes through which a company utilizes its resources—especially the processes of integration, reconfiguration, acquisition, and release of resources—to match or even create market changes (Eisenhardt & Martin, 2000). Although employees are one of its most important pillars, employee dynamic capabilities are rarely studied separately in the literature but rather as part of the overall dynamic capability elements (Bieńkowska & Tworek, 2020). However, in modern firms, personnel roles and dynamic competencies are crucial to sustainable growth of the organization (Bieńkowska & Tworek, 2020). Additionally, in 2018, Wang and other scholars empirically demonstrated that competitive attitudes and behaviors can drive more work job crafting, enhancing the performance of bank sales employees (Wang et al., 2018). Job crafting is defined as the process where employees actively choose tasks, adjust job content, and make work more meaningful. Employees with a high degree of job crafting can also quickly adapt to job requirements and resources (Zhu et al., 2022). In contrast to job crafting, Employee dynamic capability is explained as the ability to be sensitive to environmental changes (recognizing opportunities and risks that may affect workplace performance), adapt to environmental changes (taking preventive measures to avoid workplace issues), proactive workplace problem-solving and innovation while continuing personal development (Bieńkowska & Tworek, 2020). By comparing the two definitions, it can be concluded that employee dynamic capability not only encompasses all the features of job crafting but also includes the ability to perceive, adapt to, and proactively address issues in a dynamic environment (Shi et al., 2022). Research indicates that employee dynamic capabilities are not only crucial for their anticipated future job performance but also contribute to an elevated positive attitude toward the transformation of the digital workplace. This positive attitude, in turn, actively supports the willingness to engage in necessary change processes (Meske & Junglas, 2021). Furthermore, In the quickly changing digital market, many scholars believe that employee dynamic capabilities affect job performance more than attitudes and actions (Bieńkowska & Tworek, 2020; Luo & Tworek, n.d.; Wali et al., 2020). This claim lacks empirical proof. Thus, this study compares the effects of employee competitive attitudes, behaviors, and dynamic capacities on digital performance to fill this gap.

Research Question 3: Can a competitive climate moderate the impact of employee competitive attitudes and behaviors to drive employee dynamic capabilities and

enhance employee digital performance?

Moreover, Richter and other scholars research suggests that adopting dynamic capabilities approach to identify and design employee work practices can lead to workplace improvements. Favorable job design features, including motivation, social, and contextual factors, form the foundation for achieving employee performance and well-being, regulated by psychological states (Richter et al., 2018). Therefore, this study considers a competitive climate as a moderating variable to moderate the relationship between employee competitive attitudes and behaviors and employee dynamic capabilities. When workers are forced to compare their performance to that of others in the workplace, it creates a competitive climate that can be stressful and competitive. Motivated by this environment, workers acquire a competitive consciousness, regardless of their innate competitive characteristics (Khon, 1992).

Regarding employee dynamic capabilities, scholars have repeatedly emphasized the prominent role of employee dynamic capabilities in enhancing employee performance in dynamically changing markets (Alwali, 2023; Bieńkowska & Tworek, 2020; Eikelenboom & de Jong, 2019; Wali et al., 2020). In the digital era, employee performance has transformed into digital performance (Shao et al., 2022; Zhang et al., 2022b). Moreover, scholars have repeatedly emphasized the significant role of employee dynamic capabilities in performance in a dynamic market. Therefore, this study aims to explore how employee competitive attitudes and behaviors, under the moderation of a competitive climate, can enhance the effect of digital performance. This study, grounded in Teece's (2018) dynamic capability framework, posits that the interplay of resources, dynamic capabilities, strategy, and the internal/external environment forms an organic ecosystem that enhances employees' competitiveness (Teece, 2018). In the long run, employee performance is influenced by the outcomes of their behavior, contingent upon the actual work environment and job characteristics (Gaiardelli et al., 2019). In the current enthusiasm of SMEs in China to pursue digital advantages, this study offers a fresh perspective and viable insights into leveraging the traits and capabilities of employees within the ever-evolving digital ecosystem.

2. Theoretical Background and Hypotheses Development

2.1 Theoretical Background

The RBV emphasizes resources as the wellspring of a firm's competitive advantage, ensuring its sustained and long-term development. According to this theory, a firm is an entity composed of various resources, and the accumulation of resources determines competitive advantage (Barney, 2001). The most crucial resource types meet the criteria defined by Barney (2001): valuable, rare, inimitable, and non-substitutable (VRIN) (Barney, 2001). VRIN resources can sustain enduring competitive advantages. They are often intangible (such as employees' technological adaptability, and human capital), partly because the ownership of most intangible assets is unclearly defined, making them nearly non-negotiable and challenging to acquire (Teece, 2007). Nevertheless, companies with similar resources may exhibit different performance in practice, experiencing varied competitive advantages. Resource combinations alone cannot fully account for the sustained impact of competitive

advantages. Addressing the role of dynamic capabilities, scholars have introduced the DCT (Teece, 2018).

This theory posits that capabilities encompass a combination of essential skills and tacit knowledge within a company, including the resources accumulated by the enterprise over time (Teece, 2018). Dynamic capabilities can be considered as intellectual capital that is challenging for other enterprises to imitate or replicate. Businesses must concentrate their resources, establish a distinctive core competency framework, enhance their core capabilities, and rely on the accumulation and utilization of internal core resources and capabilities to gain a competitive advantage (Shan et al., 2019). Due to societal progress, the emergence of new technologies, and the increasingly complex market environment, core competencies struggle to adapt in dynamic settings. This rigidity leads to missed opportunities and a loss of competitive advantage for businesses. In this context, technological resources, human capital, and dynamic capabilities have become pivotal elements for enterprises to attain a competitive edge. In fact, the DCT was developed precisely to address these changes(Teece, 2018). Furthermore, dynamic capabilities emphasize the integration of resources and the ability to be resilient in dynamic environments to overcome the rigidity of core competencies. Moreover, the effective utilization of technology and human resources coupled with dynamic capabilities and organizational adaptability, can assist businesses in enhancing creativity and maintaining sustainable competitive advantages (Teece, 2018). Therefore, based on the above discussion, this study has constructed the research model depicted in Figure 1.

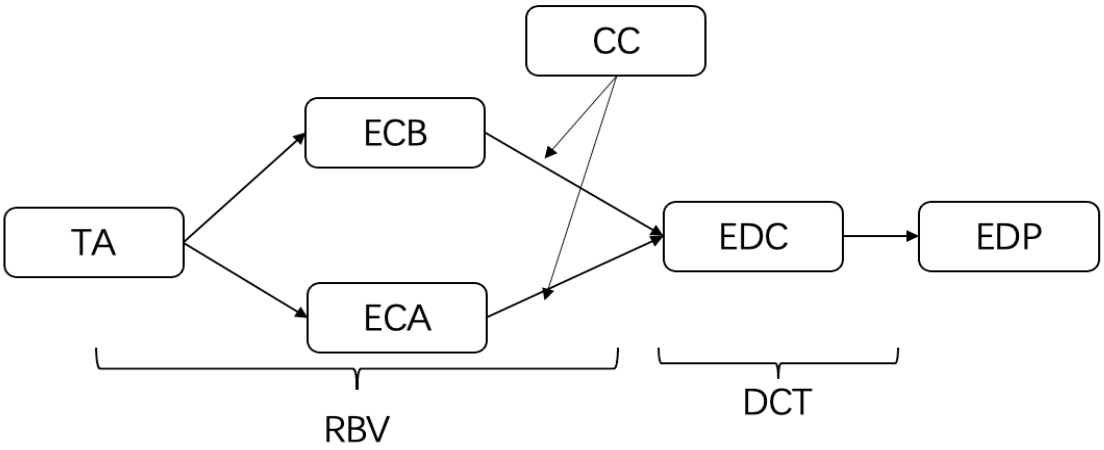

Figure 1. Research Modelling (Note 1)

2.2 Technology Adaptation and Employee Competitive Attitude, Employee Competitive Behavior

Adaptation is the process of individual learning, negotiation, formulation, and maintenance of behaviours that suit the specific organizational environment (Bruque et al., 2008). Therefore, within an organization, through the process of adaptation, employees typically alter or modify

their behaviour to align with various work conditions and diverse work objectives (Rubel et al., 2017). When employees are presented with opportunities to leverage cutting-edge technologies, they often experience an increased sense of competence in their roles. This bolstered confidence makes employees more competitive, as they believe they possess the exceptional skills and tools needed for outstanding performance (Rubel et al., 2020). An advanced work environment and digital technologies are also expected to enhance employees' sense of well-being (employee attitudes). Well-being is crucial for retaining qualified and experienced employees within the company (Blahopoulou et al., 2022). Moreover, the adoption of technology can streamline processes, making tasks easier and faster to accomplish. When employees can work more efficiently, their competitive awareness is likely to increase, as they may set goals to surpass colleagues and achieve performance metrics (Rubel et al., 2023). Digital technology gives people flexibility in their workplace, work style, and time, which boosts job satisfaction, autonomy, productivity, and travel time and costs (Nakrošienė et al., 2019). In addition, the adaptability of digital technology strengthens coordination and communication (Waizenegger et al., 2020). Furthermore, technology often provides more convenient ways to access information, enabling employees to make wiser decisions and compete effectively in their respective roles. Access to data and analysis can foster data-driven competitive behaviours (Rubel et al., 2020). Moreover, technology can provide new tools for problem-solving and unleashing creativity, thereby inspiring innovation. Employees who perceive themselves as capable of innovating and proposing new ideas may demonstrate a stronger competitive attitude and behaviour in suggesting and implementing new solutions (Rubel et al., 2023).

This study is grounded in the specific regional context of China, and numerous research findings indicate that employees in this environment exhibit a heightened awareness of competition (Fletcher et al., 2008; Lam, 2012; Yang, 2022). Moreover, research indicates that employees within organizations are willing to embrace, adapt to, and utilize technology. This is because organizations believe that the effective adaptation of technology and the application of new knowledge can ultimately enhance employees attitude and behavior (Bala & Venkatesh, 2016). Furthermore, empirical studies have demonstrated that adaptive technology behaviors influence employee attitudes (job satisfaction) (Bala & Venkatesh, 2016). To this end, we establish the following hypothetical relationship.

H1a: Technology Adaptation is an antecedent factor of employee competitive attitude in the digital era in Chinese SMEs.

H1b: Technology Adaptation is an antecedent factor of employee competitive behavior in the digital era in Chinese SMEs.

2.3 Technology Adaptation and Employee Digital Performance

Technological adaptability is crucial for employees to remain competitive and efficient in the rapidly changing digital environment. Moreover, organizations with strong technological adaptability often exhibit higher levels of digital performance among their employees (Rubel et al., 2020). Primarily, technological adaptability specifically refers to the adjustment or alteration of technology so that users can effectively harness it to meet their needs (Elias et al.,

2012). Furthermore, technological adaptability entails understanding user behaviours that effectively embrace and utilize technology, and such adaptive behaviours significantly impact employee performance (Rubel et al., 2017). Moreover, empirical research indicates that various adaptive behaviours exhibited by employees in response to the use of digital technology have a significant impact on subsequent usage behaviour, affecting both regular and innovative performance. Additionally, user adaptability serves as a prerequisite influencing the post-adoption usage of digital technology (Zhang et al., 2022). Furthermore, Shao and other scholars have argued that organizations, by implementing digital strategies and incorporating the application of digital technology into internal work practices, positively influence employee digital performance (Shao et al., 2022). Similarly, this study posits that in SMEs in China, technological adaptability positively influences employee digital performance. To this end, the following hypothesis is formulated:

H2: There is a positive relationship between technology adaptation and employee digital performance in Chinese SMEs.

2.4 The Mediating Role of Employee Dynamic Capability

In accordance with the RBV, human capital can be deployed to enact value-creation strategies, configuring and reconfiguring these resources in ways that are not easily matched or imitated by competitors (Barney, 2001). In the context of SMEs, the relationship between organizational human capital and dynamic capabilities is depicted as a micro foundation (Nyamrunda & Freeman, 2021). Micro foundational literature on the impact of human capital on organizational operations emphasizes that companies with highly knowledgeable and experienced employees are better equipped to identify resource foundations. They possess the capability to understand and execute responses more effectively to the demands of necessary changes and the ever-evolving environment (Nyamrunda & Freeman, 2021). Furthermore, research indicates that human capital within organizations, such as employee competitive attitudes and behaviors and their adaptability to technology, serves as a determining factor for dynamic capabilities (Singh & Rao, 2016). Empirical studies suggest that dynamic capabilities mediate the respective impacts of human capital and relational capital on performance. These findings convincingly support the significance of dynamic capabilities, which enhance performance through the accumulation of research and development over time (Hsu & Wang, 2012). In addition, recent advancements in digital technology have facilitated organizations to operationalize dynamic capabilities more easily than ever before. This enables more effective collaboration and interaction among organizations and their stakeholders, thereby promoting work performance (Coreynen et al., 2020; Warner, 2019). In today's dynamic digital environment, organizations positively influence employee attitudes and behaviors through the utilization of digital technology, resulting in enhanced performance (Blahopoulou et al., 2022). Empirical research indicates a conditional correlation between employee behavior and innovation. Moreover, within an organization, employees possessing elevated attitudes and behaviors are likely to propel dynamic capabilities, thereby enhancing employee innovation performance (Rodrigues et al., 2021). Furthermore, Gaiardelli et al. (2019) found a short-term direct relationship between employees' attitudes and behaviors and the actual work environment and job characteristics, correlating with performance. Therefore,

based on the above discussion, we establish the following assumptions:

H3a: Employee Dynamic Capability mediates the relationship between employee competitive attitude and Employee Digital Performance in Chinese SMEs.

H3b: Employee dynamic capability mediates the relationship between employee competitive behaviour and Employee Digital Performance in Chinese SMEs.

2.5 The Moderating Role of Competitive Climate

A "competitive climate" is a business setting where employees must compare their performance to others, producing pressure. This environment encourages workforce competition (Li et al., 2016). Beersma and other scholars showed that competitive workplaces motivate employees to excel. Competitive personnel are more inclined to improve performance by developing dynamic capabilities (Beersma et al., 2003). Empirical research has shown that the competitive climate interacts with individuals' competitive attitudes and behaviours, which in turn affects their job crafting and ultimately impacts their job performance (Wang et al., 2018). Building on the discussed relationship between job crafting and employee dynamic capabilities, similarly, this study posits that the interaction among employee adaptability to technology, competitive climate, and employee competitive attitudes and behaviours can influence employee dynamic capabilities (Phan et al., 2022). In the context of the specific cultural and regional environment in China, a robust competitive environment can serve as a situational stimulus, motivating individuals to exhibit greater agility and effectiveness, especially in situations where competitive attitudes are less prevalent. The competitive climate can stimulate employees' competitive attitudes, leading to stronger competitive behaviours and, consequently, a greater impact on employee dynamic capabilities. When the competitive climate is robust, this environmental force becomes effective in enhancing individual competitive attitudes and behaviours, influencing employee dynamic capabilities. Put simply, the competitive climate (an environmental component)and technological adaptability, competitive attitudes/behaviours are interconnected(Tran Huy, 2023). In an environment with weaker competitiveness, the impact of competitive attitudes on dynamic capabilities may be moderated. Factors such as collaboration and teamwork, too, can influence the development of dynamic capabilities(Wang et al., 2018). Recent research has emphasized the importance of dynamic capabilities in navigating complex digital environments, enabling employees to adapt to and excel in the digital domain. Therefore, this paper proposes that in Chinese SMEs, a competitive climate characterized by a balance between healthy competition and collaboration may amplify the positive impact of employees' competitive attitudes and behaviors on dynamic capabilities. Consequently, this might potentially enhance employee digital performance.

H4a: The competitive climate moderates the relationship between employee competitive attitude and employee dynamic capability, Specifically, under a high level of competitive climate, the relationship between competitive attitude and employee dynamic capability will be stronger.

H4b: The competitive climate moderates the relationship between employee competitive

behaviours and employee dynamic capability, Specifically, under a high level of competitive climate, the relationship between competitive behaviours and employee dynamic capability will be stronger.

3. Research Methodology

To achieve the research objectives and address the research questions, this study employs a quantitative methodology. Data is collected through surveys and subsequently analysed to examine the relationships between variables and test the proposed hypotheses. The study focuses on SMEs engaged in digital operations as the unit of analysis.

3.1 Sample and Data Collection

The survey questionnaire consists of two parts: The first part of the questionnaire is the core section, comprising five latent variables and their respective 26 measurement indicators (Table 1). To measure these latent variables, a 7-point Likert scale is employed, ranging from "strongly disagree" to "strongly agree," with scores increasing from 1 to 7. This scale is used to assess employee competitive attitude/behavior, competitive climate, and employee dynamic capability. Technology adaptation and employee digital performance, on the other hand, are evaluated using a 5-point Likert scale. The scales used in this study follow standard translation and back-translation procedures.

The survey commenced on August 10, 2023, and the list of SMEs was obtained through two methods: the SME Information Network (www.sme.com.cn) and the China Administration for Industry and Commerce. The purpose of the survey was explained to the selected companies. A purpose sampling method was employed to proportionally select 320 potential companies across the four provinces. Subsequently, the survey was distributed to potential respondents using the Questionnaire Star platform, emphasizing the anonymous nature of the survey. By October 16, 2023, 108 companies had responded, resulting in a response rate of 33.75%. A total of 800 survey questionnaires were distributed, and 500 responses were received. After verification, 94 invalid questionnaires were excluded, yielding a final set of 366 valid responses (73%). Considering the characteristics of this study, statistical analysis using G. Power determined that a sample size of 160 or more is appropriate. Therefore, we believe the sample size used for analysis is sufficient (Faul et al., 2007).

Table 1. Variables Operationalization

No	Technology adaptation	Source
1	I have skilfully used the tools and applications the new technology provides	Rubel et al., 2016
2	I have quickly become familiar with the new technology	
3	It was easy for me to adjust myself to the new technology introduced in my organization.	
4	I have accurately managed all the facilities the new technology provides	
5	I consider myself a frequent user of my organization's technology	
	Employee competitive attitude	
1	I enjoy competition because it gives me a chance to discover my abilities.	Ersilia, 2018

2	Competition can lead to the formation of friendships with others.	
3	I enjoy competition because it tends to bring out the best in me rather than as a means of feeling better than others.	
4	I like competition because it teaches me a lot about the self.	
5	I value competition because it helps me to be the best that I can be.	
6	I find competition enjoyable because it lets me express my own potential and abilities in competition.	
7	Without the challenge of competition, I might never discover that I had certain potential or abilities.	
8	I enjoy competition because it brings me and my competitors closer together as human beings.	
9	I enjoy competition because it helps me to develop my own potentials more fully than if I engaged in these activities alone.	
10	Through competition I feel that I am contributing to the well-being of others	
	Employee competitive behaviour	
1	I try to be the best in the team.	Wang et al., 2018
2	I put effort to win out.	
3	I take my best to surpass any others.	
4	I always attempt to do better than others.	
5	I strive for first place.	
	Employee Dynamic Capability	
1	Change sensitivity—item: I quickly notice and successfully recognize in the environment (both inside and outside of the organization) opportunities and threats (including early warning signals) that can affect the work I do.	Bieńkowska & Agnieszka, 2020
2	Change adaptation—item: I adapt effectively to the opportunities and threats appearing in the environment (both inside and outside the organization). I undertake preventive actions that will enable me to carry out the tasks entrusted to me despite changes in the environment.	
3	Change sensitivity—item: I quickly notice and successfully recognize problems appearing at the workplace	
4	Problem-solving and innovative approach—item 1: I quickly solve problems appearing, I do it on my own or seek support (within the scope of knowledge and information) that allows me to perform assigned tasks.	
5	Problem-solving and innovative approach—item: I generate innovative ideas and original solutions to problems.	
6	Personal development—item: I constantly develop my competencies and raise my qualifications. I develop myself through my work.	
	Competitive climate	
1	My manager frequently compares my results with those of other employees.	Wang et al., 2018
2	The amount of recognition you get in this company depends on how your performance ranks compared to other employees.	
3	Everybody is concerned with finishing at the top of the performance rankings.	
4	My coworkers frequently compare their results with mine.	

	Employee Digital performance	Shao et al., 2022
1	I find solutions to work problems after performing analytics with the big data generated by smart/digital technologies.	
2	I need less time to complete job tasks by analyzing big data.	
3	The quality of my work has been improved with analytics of big data.	
4	I try out innovative ways to improve business performance or product/service quality through performing analytics of the big data generated by smart/digital technologies.	
5	I come up with creative solutions to task problems through data analytics.	
6	I try new and innovative ideas at work when performing analytics with big data.	

The second part focuses on the demographic and social characteristics of the respondents, including gender, age, work area, education, etc. Additionally, the primary target of this study is SMEs engaged in digital operations. Therefore, the survey includes two specific criteria: firstly, meeting the definition requirements of SMEs (Xie et al., 2010) (Table 2).

The data for this study were collected from SMEs in four provinces: Shanghai, Guangzhou, Anhui, and Guizhou. These four provinces were chosen for the survey firstly because Shanghai is known as a financial and economic center; Guangzhou is a manufacturing and trade center; Hefei: has traditional industries and an emerging economy; and Guizhou is in the stage of digital transformation and development. Secondly, because SMEs cover a wide range of industries and contribute significantly to overall economic output, ensuring a representative sample.

3.2 Measures

Table 2. Basic parameter analysis

		Frequency	Percent
Gender	Male	221	60.4
	Female	145	39.6
Age	18–25	129	35.2
	26–30	77	21.0
	31–40	123	33.6
	41–50	23	6.3
	51–60	13	3.6
	60 above	1	0.3
Education Background	Middle School below	6	1.6
	Middle School	7	1.9
	High school	50	13.7
	Bachelor	228	62.3
	Postgraduate students	75	20.5
	Total	366	100.0
No of employees	＜10 employees	49	13.4
	10employees ＜49employees (10–49 人)	77	21.0
	50 employees ＜249 employees (50–249 人)	62	16.9
	250 employees ＜400employees	43	11.7
	400employees ＜1000 employees	135	36.9
	More than1000 employees	0	0.0
	Total	366	100.0

3.3 Model Fit Tests

The model fit refers to the degree of agreement between the theoretical model and the observed model. Various fit indices were employed in this study to assess the quality of the measurement model. Typically, readings exceeding 0.9 are regarded as exceptional, while those falling within the range of 0.8 to 0.9 are considered acceptable. Examples of such indices include GFI, AGFI, CFI, TLI, and NFI. Additionally, disparity indices, typically aiming for values less than 0.8, with a stricter criterion of 0.05, were utilized, such as RMSEA and SRMR (Iacobucci, 2010). The selection of these fit indices in this study is grounded in their satisfactory performance in simulation studies (Hu & Bentler, 1999). As shown in Table 3, the results indicate that the structural model fits the data very well. Using maximum likelihood estimation in the structural equation modelling analysis, the fit indices of the data to the model were as follows: $\chi 2(266) = 753.461$ ($p < 0.001$), $\chi 2/DF = 2.566$, CFI = 0.949, AGFI = 0.800, IFI = 0.959, RMSEA = 0.007, CFI = 0.949, TLI = 0.943. all the main

fit indices were above or close to 0.9. these results indicate that the proposed attitude-behaviour association model is theoretically and empirically robust (Table 3).

Table 3. Fit Model Test

Fit indicator	χ2/DF	SRMR	RMSEA	GFI	AGFI	IFI	CFI	TLI
Reference value		<0.080	>0.080	>0.900	>0.900	>0.900	>0.900	>0.900
Test value	2.566	0.037	0.07	0.822	0.800	0.949	0.949	0.943

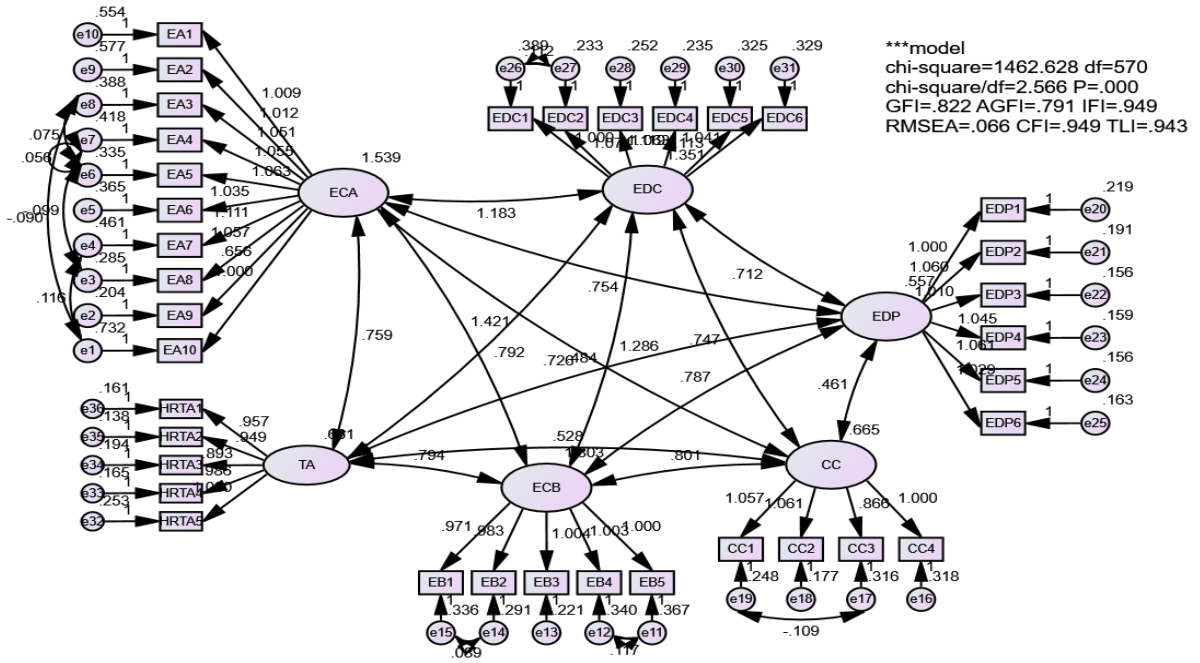

Figure 2. Fit Model Test

3.4 Scale Reliability and Validity Tests

After building the measurement model, the reliability and validity of the obtained factors were assessed (Table 4). Cronbach's alpha for each scale exceeded 0.9, showing strong internal consistency. The value of the constitutive reliability (CR) is the combination of the reliability of all measurement questions and indicates the internal consistency of the constructs, with a higher CR indicating a higher internal consistency of the constructs, and 0.7 being an acceptable threshold (F. Hair Jr et al., 2014). The AVE represents the average explanatory power of the latent variables on the measures. A higher AVE indicates a stronger convergence of the constructs. It is recommended that the AVE be larger than 0.5, with a threshold of 0.36-0.5 considered acceptable (Fornell & Larcker, 1981). As shown in Table 4, the composite reliability scores ranged between 0.908 and 0.982, whilst the AVE scores ranged between 0.712 and 0.916, both of which exceeded the recommended 0.70 and 0.50

thresholds. These results indicate that the measurement models have mutual validity and reliability. Convergent validity assesses whether the items associated with a particular construct converge with the underlying construct. The factor loadings for each construct exceeded the 0.50 critical value (ranging from 0.825 to 0.944) and were statistically significant ($p < 0.001$). In addition, these factor loadings were statistically significant ($p < 0.001$) with z-values ranging from 16.868 to 30.038 (all exceeding the critical value of 1.96).

Table 4. Reliability and validity test (Note 2)

Dimensions	Items	Unstad,	S.E.	Z	P	Stand.	Cronbach's	CR	AVE
ECA	EA10	1				0.823	0.971	0.973	0.785
	EA9	0.656	0.031	21.269	***	0.874			
	EA8	1.057	0.045	23.404	***	0.926			
	EA7	1.111	0.045	24.678	***	0.897			
	EA6	1.035	0.046	22.468	***	0.905			
	EA5	1.063	0.046	22.886	***	0.916			
	EA4	1.012	0.049	20.529	***	0.856			
	EA3	1.055	0.048	22.102	***	0.897			
	EA2	1.009	0.049	20.649	***	0.860			
	EA1	1.051	0.05	20.821	***	0.902			
ECB	EB5	1				0.912	0.968	0.966	0.852
	EB4	1.003	0.028	36.455	***	0.918			
	EB3	1.004	0.031	32.549	***	0.944			
	EB2	0.983	0.033	30.038	***	0.926			
	EB1	0.971	0.034	28.933	***	0.914			
CC	CC4	1				0.822	0.898	0.908	0.712
	CC3	0.866	0.051	16.868	***	0.783			
	CC2	1.061	0.049	21.547	***	0.899			
	CC1	1.057	0.053	19.792	***	0.866			
EDP	EDP1	1				0.847	0.953	0.954	0.774
	EDP2	1.06	0.048	22.284	***	0.876			
	EDP3	1.01	0.045	22.64	***	0.886			
	EDP4	1.045	0.046	22.858	***	0.890			
	EDP5	1.029	0.046	22.571	***	0.885			
	EDP6	1.061	0.046	23.174	***	0.895			
EDC	EDC2	1				0.881	0.969	0.982	0.916
	EDC6	1.074	0.03	35.266	***	0.933			
	EDC5	1.063	0.038	27.908	***	0.927			
	EDC4	1.119	0.039	28.421	***	0.937			
	EDC3	1.113	0.042	26.73	***	0.915			
	EDC1	1.041	0.04	26.106	***	0.904			
TA	TA5	1				0.850	0.927	0.944	0.770
	TA4	0.986	0.043	23.188	***	0.892			
	TA3	0.893	0.042	21.199	***	0.855			
	TA2	0.949	0.041	23.4	***	0.901			
	TA1	0.957	0.042	22.887	***	0.889			

3.5 Discriminatory Validity

Discriminant validity is conceptualized as a low correlation or significant difference between a latent trait represented by a latent variable and a latent trait represented by other latent variables. If the square root of the AVE for each latent variable is greater than the inter-variate correlation between that latent variable and the other latent variables, then the discriminant validity is robust. This indicates a significant difference between the latent traits reflected by the indicator variables (Fornell & Larcker, 1981). Each latent variable in this investigation had a square root of mean RMS that was greater than the correlation between that latent variable and the other latent variables, as indicated in Table 5. The measuring model demonstrated excellent discriminant validity as a result.

Table 5. Correlations and average variance extracted.

	TA	EDC	EDP	CC	ECB	ECA
TA	**0.878**[a]					
EDC	0.839[b]	**0.957**				
EDP	0.798	0.821	**0.880**			
CC	0.796	0.788	0.758	**0.844**		
ECB	0.727	0.824	0.786	0.731	**0.923**	
ECA	0.753	0.821	0.814	0.717	0.853	**0.886**

3.6 Path Hypothesis Testing

This study tested the theoretical hypotheses in the previous part using structural equation modelling. Structural equations can control measurement error in model estimation and test mediation by comparing alternative models to the hypothetical model. The relationship between ECB, ECA, EDC, and EDP is firstly regressed, and then the structural equation model is further subjected to path analysis and hypothesis testing. The standardized path coefficients between variables (Table 6) show that the relationship between S&T adaptation and ECA is significant ($\beta1 = -1.211$, $p < 0.01$). This implies that hypothesis H1a is valid. there is a significant positive effect of TA on ECB ($\beta2 = 1.288$, $p < 0.001$). Hypothesis H1 is valid. there is a significant relationship between TA and EDP ($\beta3 = 0.753$, $p < 0.001$) and H2 is valid. there is a significant direct effect of ECA on EDC ($\beta4 = 0.0.437$, $p < 0.001$), as well as ECB and EDC ($\beta5 = 0.418$, $p < 0.001$). there is also a significant relationship of EDC on EDP ($\beta6 = 0.287$, $p < 0.001$). It shows that H3a, and H3b are supported. Therefore, hypotheses H1a, H1b, H2, H3a, and H3b are empirically supported.

Table 6. Path Relationship Test

Path Relationship	Estimate	S.E.	C.R.	P	Stand	Hypnosis
TA→ECA	1.211	0.079	15.309	***	0.796	supported
TA→ECB	1.288	0.079	16.379	***	0.777	supported
ECA→EDC	0.437	0.041	10.602	***	0.465	supported
ECB→EDC	0.418	0.036	11.458	***	0.485	supported
EDC→EDP	0.287	0.033	8.63	***	0.462	supported
TA→EDP	0.398	0.048	8.213	***	0.447	supported

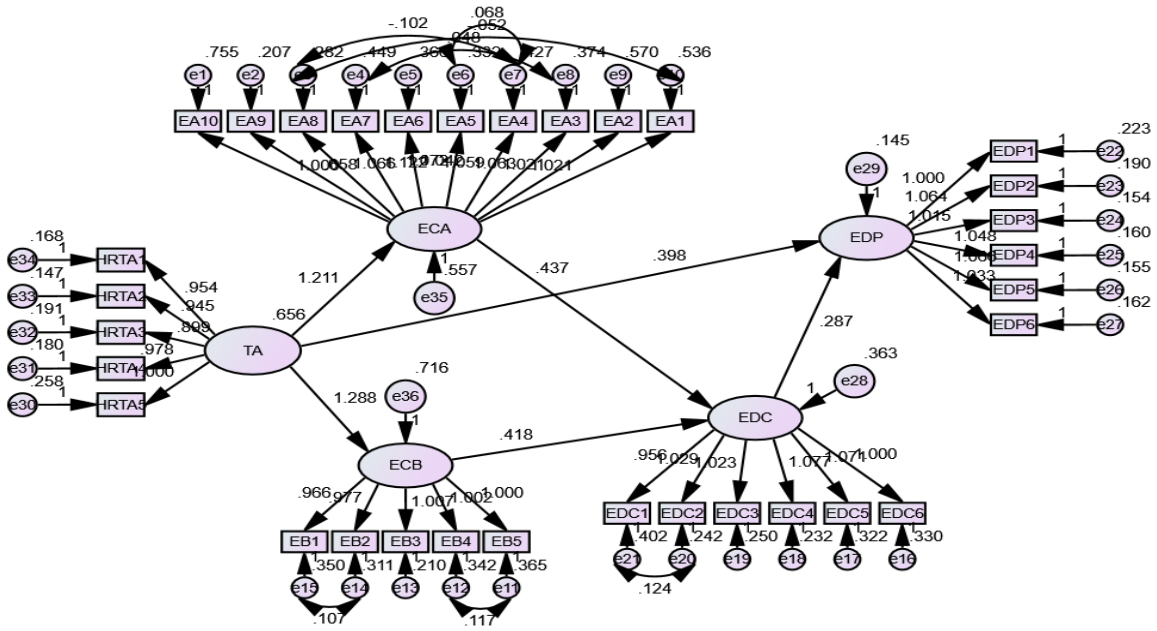

Figure 3. Structural analyze model.

3.7 Mediation Effect Test

To investigate mediation effects, Hayes considered Bootstrap to be the most robust method, which is fully integrated into AMOS and allows for any number of random samples to be taken with appropriate confidence intervals. The rationale for this approach is that if the confidence interval is not zero, there is no mediation effect; if the confidence interval is zero, there is a mediation effect (Hayes & Rockwood, 2017). In SEM, this study performed 1,000 iterations of bias-corrected percentage Bootstrap resampling for the direct effect and indirect effect to test for mediating effects. The results are shown in Table 6. The indirect effects of "TA-ECB-EDC-ED", and "TA-ECA-EDC-EDP" are both statistically significant as neither of their 95% confidence intervals contain zero. In addition, it can be seen that "IE1/TIE" explains 50 % and "IE2/TIE" explains 50% (Table 7).

Table 7. The mediating effect of Bootstrapping (Note 3)

Path relationship		Point estimate	Product of coefficient		Bootstrapping			
					Bias-corrected		Percentile 95% CI	
			SE	Z	Lower	Upper	Lower	Upper
Indirect Effects								
DistalIE1	TA→ECA→EDC→EDP	0.271	0.073	3.712	0.119	0.408	0.122	0.415
DistalIE2	TA→ECB→EDC→EDP	0.271	0.064	4.234	0.176	0.429	0.168	0.417
TIE	DistalIE1	0.543	0.050	10.860	0.447	0.641	0.448	0.642
Comparison of mediating effects								
EIDE	DistalIE2 VS. DistalIE2	0.000	0.128	0.000	-0.31	0.207	-0.273	0.234
The ratio of mediated effects								
P1	DistalIE1/TIE	0.500	0.118	4.237	0.216	0.678	0.236	0.702
P2	DistalIE2/TIE	0.500	0.118	4.237	0.322	0.784	0.298	0.764

3.8 Moderating Effecting Test

The SPSS macro-PROCESS from Hayes (2013) was used to analyze whether the upper half of the mediating role of the enforcing employee dynamic capability between the employee competitive attitude/behavior, and the employee digital performance is moderated by the competitive climate. The test was conducted here using Model 7. The results show (Table 8): using the test for the mediating effect of regulation, the mediating index of regulation for the competitive climate in moderating the pathway MCB-EDC-EDP is 0.133, and the Bootstrap 95% confidence interval is [0.076, 0.190], which does not contain 0, and there is a mediating effect of regulation. When competitive climate moderates the path of MCA-EDC-EDP, using the test method of the mediating effect of regulation, the mediating index of regulation is 0.115, and the 95% confidence interval of Bootstrap is [0.053, 0.176], which does not contain 0, and there is a mediating effect of regulation. In summary, the mediating effect of employees' competitive attitude and competitive behavior on the relationship between employee dynamic ability and employee digital performance is moderated by the competitive climate, and there is a moderated mediating effect, i.e., both H4a, and H4b are supported.

Table 8. Moderating Effects Test (Note 4)

	Mode1(MCB）						Mode2(MCA)				
Index	Coeff	se	t	p	95%CI	Index	Coeff	se	t	p	95%CI
constant	2.728	0.565	4.833	0.000	[1.618，3.839]	constant	2.281	0.593	3.847	0.000	[1.115,3.448]
MCB	0.040	0.103	0.392	0.695	[-0.162,0.242]	MCA	0.129	0.119	1.087	0.278	[-0.105,0.363]
MCC	-0.170	0.177	-0.963	0.336	[-0.518,0.178]	MCC	-0.034	0.174	-0.193	0.847	[-0.376,0.309]
Int_1	0.133	0.029	4.576	0.000	[0.076,0.190]	Int_2	0.115	0.031	3.664	0.000	[0.053,0.176]

Table 9 shows that when the competitive climate is low, employee competitive attitude moderation mediation has a limited indirect influence on digital performance through employee dynamic capability (ρ_{cc} = 0.126, Boot 95% CI does not include 0). Conversely, high employee competitive behaviour has a higher indirect effect on digital performance through employee dynamic capability (ρ_{cc} = 0.179, Boot 95% CI does not include 0). Similarly, in the case of the moderation mediation path of employee competitive behaviours, when the competitive climate is low, the influence of employee competitive behaviours on digital performance through employee dynamic capability is relatively insignificant (ρ_{cc} = 0.139, Boot 95% CI does not include 0). On the other hand, when there is a high level of competitive behaviors, the impact of an employee's competitive mindset on digital performance through their dynamic capability is more pronounced (ρ_{cc} = 0.213, Boot 95% CI does not include 0).

Table 9. Bootstrap test with moderated mediation effect (Note 5)

		Mode (MCA)			Mode (MCB)		
Moderated mediation effects	Moderator	Effect	Boot SE	95%CI	Effect	Boot SE	95%CI
	Low CC(M-1SD)	0.126	0.027	[0.076,0.180]	0.139	0.029	[0.086,0.199]
	Media CC(M)	0.152	0.028	[0.104,0.207]	0.176	0.028	[0.121,0.233]
	High CC (M+1SD)	0.179	0.032	[0.124,0.245]	0.213	0.032	[0.151,0.278]
Comparison of mediation	Mean-Low	0.026	0.011	[0.008,0.049]	0.037	0.011	[0.013,0.056]
effects with moderation	High-Low	0.053	0.022	[0.015,0.098]	0.074	0.022	[0.027,0.113]
	High-mean	0.026	0.011	[0.008,0.049]	0.037	0.011	[0.013,0.056]

To demonstrate the moderating effects and directions more visually, Split plot graphs were generated to examine the impact of employee competitive attitude and behaviours on employee dynamic capability when the competitive climate is above and below one standard deviation, as illustrated in Figure 4 and Figure 5.

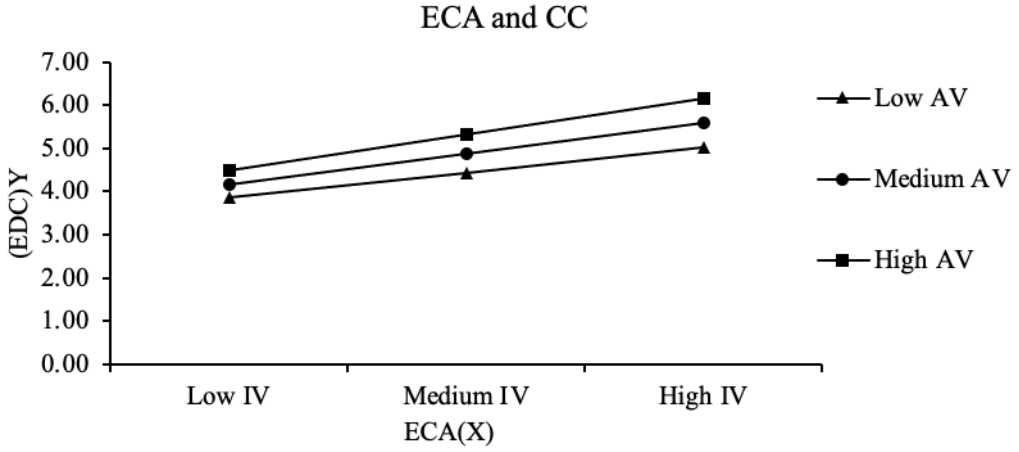

Figure 4. Moderating effects of CC on the ECA-EDC relationship

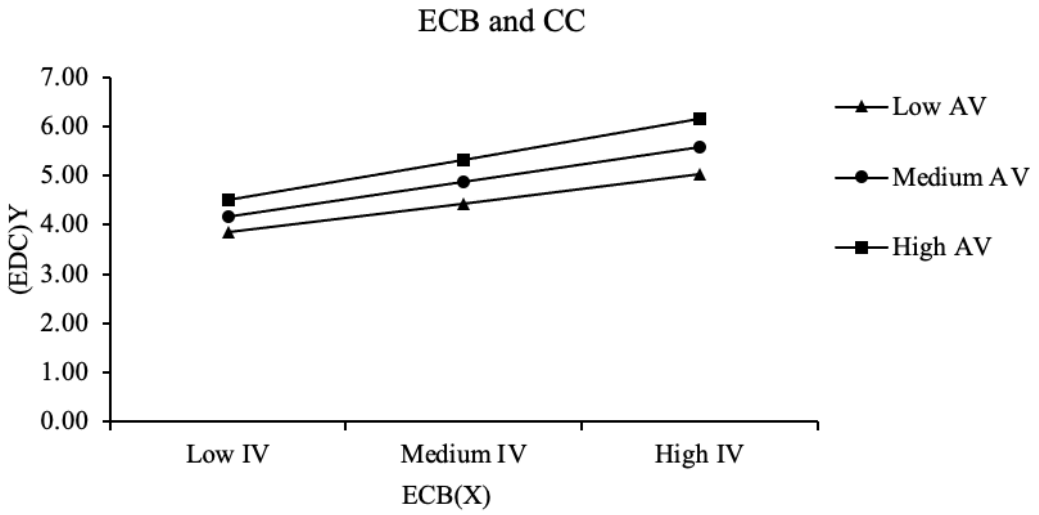

Figure 5. Moderating effects of CC on the ECB-EDC relationship.

Figure 6 presents the estimated path coefficients of the model. For conciseness, this study lists the coefficients between latent variables (as shown in Figure 5).

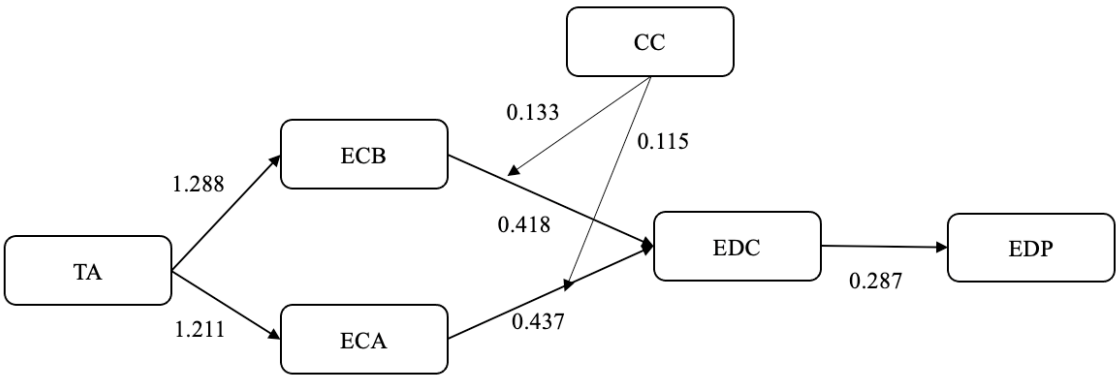

Figure 6. Model estimation for the moderation-mediation model.

4. Discussion

Given the prevailing uncertainty in today's rapidly changing world, digital transformation has been recognized as a valuable capability-building strategy, enabling organizations to compete in dynamic and competitive environments. In this context, this study aims to explore the contribution of technology adaptability, considering the adaptability of employees to

technology. Technology adaptability, as a driving factor for employee competitive attitudes and behaviours, is posited to empower competitive employees to enhance dynamic capabilities, consequently improving employee digital performance.

To address RQ1 and test H1a and H1b, the results indicate that technology adaptability positively influences both employee competitive attitudes and behaviours. Therefore, the support for H1a and H1b suggests that technology adaptability is a crucial driver for both employee competitive attitudes and behaviours. First, the significant positive effect of technological adaptability on employee competitive attitudes and competitive behaviours is in similar agreement with the findings of (Bala & Venkatesh, 2016; Blahopoulou et al., 2022; Rubel et al., 2017, 2020) and others. This finding implies that employees with technological adaptability can enhance their competitive attitudes and behaviours to adapt to the job requirements in a competitive climate, which drives their dynamic capabilities to outperform others. Therefore, in the digital era, organizations help employees improve their ability to adapt to technology by improving the work climate and providing training, which results in individuals in organizations having stronger competitive attitudes and behaviours. Initially, the significant impact of technology adaptability on employee competitive attitudes and behaviours, as found by (Bala & Venkatesh, 2016; Rubel et al., 2023; Waizenegger et al., 2020), indicates a consistent pattern. This discovery suggests that employees with technological adaptability can enhance their competitive attitudes and behaviours in a competitive environment to meet job requirements, thereby propelling their dynamic capabilities and surpassing others. Therefore, in the digital era, organizations enhance individual competitiveness by improving the work environment and providing training to boost employees' adaptability to technology, fostering stronger competitive attitudes and behaviours within the organizational context.

To address RQ2, this study tested H3a and H3b. Additionally, through structural equation contrast analysis, the disparities in the impact of employee competitive attitudes, competitive behaviors, and dynamic capabilities on employee digital performance were analyzed (Table 10).

Table 10. Path Relationship

Path relationship	Path coefficient	S.E.	C.R.	P	Stand.
ECA→EDP	0.207	0.041	5.089	***	0.349
ECB→EDP	0.082	0.038	2.125	0.034	0.148
EDC→EDP	0.253	0.039	6.490	***	0.413

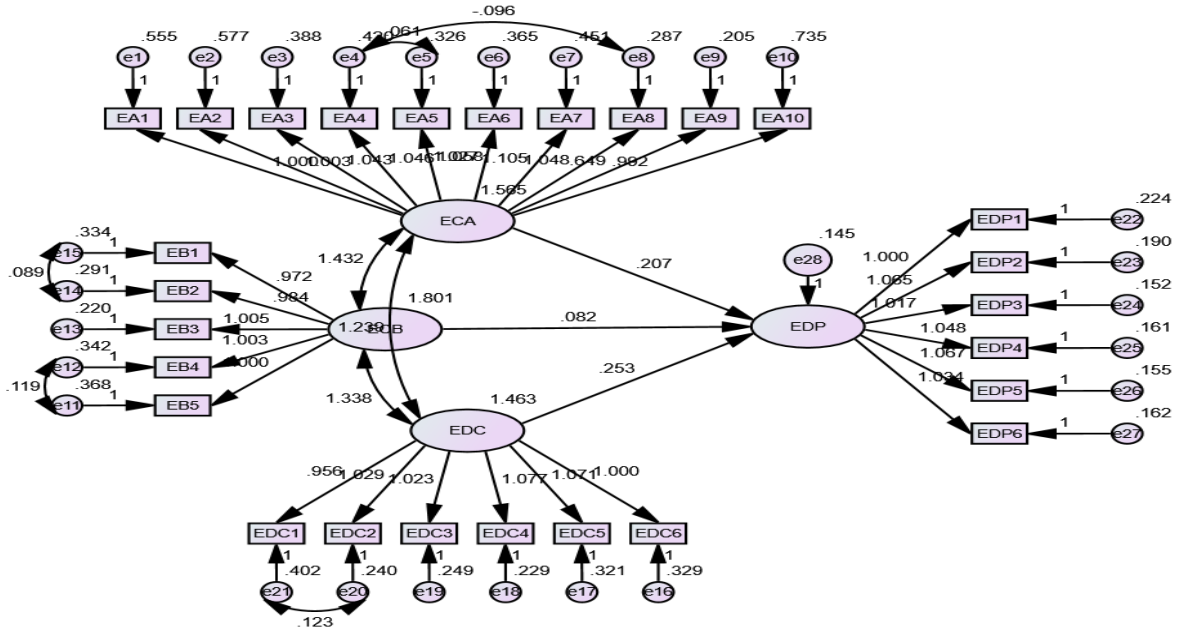

Figure 7. Analyze Model

The results indicate, firstly, that employee dynamic capabilities mediate the relationship between employee competitive attitudes and behaviors and employee digital performance, supporting H3a and H3b. This finding implies that in the digital era, employees with technological adaptability influence their competitive attitudes and behaviors, enhancing the dynamic capabilities of employees in SMEs. Furthermore, through comparative analysis, we found that the impact of employee dynamic capabilities (ß = 0.253, $p < 0.01$) on employee digital performance is indeed more significant than the effects of employee attitudes (ß = 0.207, $p < 0.01$) and behavioral variables (ß = 0.082, $p < 0.05$). This aligns with the predictions of (Al Wali et al., 2023; Alwali, 2023; Bieńkowska et al., 2021). Moreover, employee dynamic capabilities serve as a crucial mediating variable in the transformation of technological adaptability and employee attitudes and behaviors into employee digital performance. The study also suggests that in the digital market, the impact of employee dynamic capabilities on employee digital performance is more pronounced compared to the variables of employee attitudes and behaviors. Therefore, managers in SMEs should adopt effective management approaches to enhance employees' adaptability to technology, fostering competitive attitudes and behaviors, and promoting employees' adaptive capabilities to technological changes. This includes improving employees' perception of technological changes, seizing opportunities in emerging technologies, and transforming their adaptability to technology to increase employee digital performance (Phan et al., 2022). It underscores the positive correlation between employee competitive attitudes, competitive behaviors, the enhancement of dynamic capabilities, and the impact on digital performance. This emphasizes the importance of cultivating a competitive mindset and encouraging behaviors conducive to organizational adaptability and success in the digital age.

To address RQ3, the validation of H4a and H4b was conducted. The results indicate that the

competitive atmosphere moderates the relationship between employee competitive attitudes and behaviors and employee digital performance. Therefore, H4a and H4b are supported, suggesting that the research on the competitive cultural atmosphere in a specific region in China has a significant impact on organizational development and performance improvement. Moreover, from the Bootstrap analysis results, both the "TA-ECB-EDC-EDP" and "TA-ECA-EDC-EDP" indirect effects are statistically significant, with their 95% confidence intervals not including zero. Furthermore, it can be observed that the effects of the two mediated paths on employee digital performance are each 50%. Thus, the role of employee competitive attitudes and behaviors, along with employee dynamic capabilities as a chain-mediated process involving technological adaptability and employee digital performance, exhibits a similar effect on employee digital performance. Additionally, the significant moderating effect of the competitive atmosphere on employee competitive attitudes and behaviors and EDP is consistent with findings from (Tran Huy, 2023; Wang et al., 2018). This discovery implies, firstly, that in the fiercely competitive digital environment, employees are motivated to surpass their peers. This drive propels them to excel in digital tasks. As they actively seek to enhance their skills and capabilities for a competitive edge, this motivation becomes a catalyst for improving enterprise data centres, where competition stimulates innovation and creativity. We encourage employees to propose innovative solutions to digital challenges, aiming to outperform their peers. This innovative drive directly enhances employee digital performance, as the adaptability to technology, competitive attitudes, and behaviours are integral components influencing employee dynamic capabilities, thereby boosting digital performance indispensably (Yang, 2020).

In conclusion, the competitive landscape of Chinese SMEs plays a pivotal role in moderating the relationship between employee competitive attitudes and behaviours and employee digital performance. It motivates employees to strive for excellence, encourages continuous learning, fosters innovation, and enhances adaptability. All these factors are integral components of Employee Dynamic Capabilities, making it a critical regulatory factor in driving digital performance within a competitive environment.

5. Conclusions

The current research indicates that in the digital era, technological adaptability, employee competitive attitudes, and behaviours can interact with the competitive climate, influencing employee dynamic capabilities and, consequently, driving employee digital performance. We find that technological adaptability serves as a prerequisite for competitive attitudes and behaviours. Competitive attitudes and behaviours improve employee dynamic capabilities, which promotes digital performance. The competitive climate moderates this relationship. Specifically, competitive attitudes and behaviours impact work conduct in distinct ways. Our study contributes to the literature in several aspects. Firstly, it validates technological adaptability and employee competitive attitudes and behaviours (human capital) as core organizational resources (Barney, 2001), driving the development of employee dynamic capabilities (Rodrigues et al., 2021). The introduced dynamic factors of employee competitive attitudes/behaviours demonstrate that competitive behaviour can be driven by organizational climate that can vary and adapt in different environments (conventional

markets and rapidly changing digital markets). This aids in understanding the mechanisms and methods for enhancing competitiveness. Moreover, our study further complements the work (Wang et al., 2018) by suggesting that individual characteristics (such as adaptability to technology and traits competitiveness) can serve as prerequisites for attitudes and behaviours. Additionally, employees with competitive attitudes and behaviours can interact with employee proactivity (job crafting and dynamic capabilities) to enhance employee digital performance.

Secondly, our study contributes to the literature on the fit between individuals and the cultural environment in the competitive domain. The Person-Environment (P-E) fit perspective posits that individuals actively interact with and adjust their behaviour to fit the environment (Bieńkowska & Tworek, 2020). Consistent with this notion, our findings indicate that technological adaptability, employee competitive attitudes/behaviours, and competitive climate interact, influencing employees' work behaviours and outcomes. It indicates that both employees (individuals) and the company (environment) play a role in determining work behaviours and performance.

Thirdly, our study results elucidate the pathways connecting technological adaptability, employee competitive attitudes and behaviours, employee dynamic capabilities, and employee digital performance. In particular, our findings suggest that employee dynamic capabilities (Al Wali et al., 2023; Bieńkowska et al., 2021; Bieńkowska & Tworek, 2020; Tworek et al., 2023; Wali et al., 2020) can account for the relationship between competitive attitudes, competitive behaviours, and job performance. This connection contributes to understanding the interplay between technological adaptability, employee competitive attitudes/behaviours, employee dynamic capabilities, and employee performance in the context of competition.

6. Limitations and Future Research

Firstly, this study was conducted in a specific region of China, focusing on SMEs. It is essential to further investigate whether the characteristics identified in this study hold true across different enterprise sizes and industries, testing the universality of the current research results. Secondly, employee competitive attitudes and behaviors are linked to individual mindsets and actions in the workplace, as individuals strive to surpass their peers, achieve personal and professional goals, and contribute to organizational success. Regarding technological adaptability, it emphasizes how individuals and organizations adopt, implement, and effectively use new technologies to enhance productivity, efficiency, and overall performance. However, these two concepts overlap and mutually reinforce each other. For instance, employees aspiring to outperform their peers may be more willing to embrace and adapt to new technologies, gaining a competitive edge. Moreover, employees with high technological adaptability can enhance job efficiency, enabling them to stand out in their roles and reinforcing their competitive attitudes. Thus, future research should examine the difference between technological adaptability and competitive attitudes and actions, requiring more data. Thirdly, this study collected data using questionnaire. While a online questionnaire survey is an effective method, it is still subject to self-reporting and subjectivity limitations,

potentially introducing some research bias. For future research, the study categorized employee digital performance into task performance and innovative performance driven by digitalization. The study did not differentiate these factors concerning task and innovation performance differences, so future research should delve deeper into this direction. Lastly, this study is grounded in the specific cultural and regional context of China, indirectly considering competitive cultural phenomena as a control variable. Future research should explore more in different industries, and regions, or investigate whether environmental variables such as organizational culture and atmosphere can moderate the relationship between employee attitudes/behaviors and dynamic capabilities, seeking a universally applicable conceptual framework for enterprise management.

7. Research Implications

The current research findings can be applied in various practical aspects. For instance, organizations can strategically recruit individuals who are interested in technology or demonstrate strong adaptability to new technologies, coupled with a competitive attitude and behavior. This approach facilitates the development of employees' dynamic capabilities, ultimately enhancing their digital performance. On an individual level, it is acknowledged that not everyone possesses equal technological adaptability. Those with lower technological adaptability can learn to adjust their competitive attitudes and behaviors in a competitive climate, adapting to job requirements and strengthening their dynamic capabilities to surpass others. It is through this ability that individuals can exhibit diverse technological adaptability. Thus, in the digital age, companies can train employees to be more competitive. By doing so, employees will demonstrate increased dynamic capabilities and digital performance. Organizations can also reinforce a competitive climate as a potent environmental force to drive employees' competitive attitudes and behaviors. Through this approach, employees will exhibit greater dynamic capabilities, leading to improved digital performance. Ultimately, both employees and organizations stand to benefit from these initiatives.

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Notes

Note 1. TA: technology adaptation; ECB: employee competitive behavior; ECA: employee competitive attitude; CC: competitive climate; EDC: employee dynamic capability; EDP: employee digital performance.

Note 2. ***p < 0.001 level (one-tailed); CR ¼ composite reliability; AVE ¼ average variance extracted. in AMOS, one loading must be fixed to 1; hence, the t-value cannot be calculated for this item.

Note 3. IE (Indirect Effects), DEA (Direct Effect for ECA), DEB (Total Direct Effect for ECB). SE denotes Standard Error; Z represents the Z value; LLCI stands for the lower limit of the 95% confidence interval; ULCI represents the upper limit of the 95% confidence interval.

Note 4. Int_1 is the interaction between MCB and CC. Int_2 is the interaction between MCA and CC.

Note 5. Mode (MCA). Represents the mediated moderating effect of employee competitive attitudes as the independent variable; Mode (ECB) represents the mediated moderating effect of employee competitive behaviours comparative.

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