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Unlocking digital performance: exploring the mediating role of employee competitive attitudes, behaviors, and dynamic capabilities in Chinese SMEs under high-involvement human resource management practice

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Abstract

Digital technology has already permeated the production and operations of organizations, with many incorporating it into employee performance evaluations. However, there remains a research gap in identifying effective approaches to achieving digital performance. Furthermore, while scholars have often mentioned the differences in employee attitudes, and employee dynamic capability (EDC) in the dynamic digital market, empirical evidence supporting this notion is scarce. This paper investigates the influence of high-involvement human resource management practices (HI-HRMPs) on employee digital performance (EDP) within Chinese small and medium-sized enterprises (SMEs), focusing on specific cultural regions in China. Using purposive sampling, four representative regions (Guangzhou, Shanghai, Guizhou, and Anhui) were selected for Survey. Structural equation modeling (AMOS) was employed to examine the relationships between HI-HRMPs as the independent variable and employee competitive attitudes, employee competitive behaviors, and employee dynamic capabilities as mediating variables, with a focus on their impact on employee digital performance. Contrary to direct effects, the study reveals that HI-HRMPs do not directly influence employee digital performance. Instead, employee competitive attitudes and behaviors, along with their dynamic capabilities, emerge as significant mediating variables in this relationship. Specifically, employee competitive attitudes and behaviors, as well as employee dynamic capabilities, play crucial roles in mediating the relationship between HI-HRMPs and employee digital performance. Furthermore, the findings indicate that employee dynamic capabilities exhibit greater influence on employee digital performance compared to employee competitive attitudes and behaviors, particularly in the context of a rapidly evolving digital marketplace. These results underscore the importance of fostering employee dynamic capabilities within SMEs to enhance digital performance in the ever-changing business landscape.

Keywords: HI-HRMPs, Employee dynamic capability, Employee digital performance, Employee competitive attitude, Employee competitive behavior, Digital transformation

Introduction

Digital technology has the potential to transform customer value, thereby rendering new business models more adept at penetrating expanding markets (Gupta & Bose, 2022). There is a significant gap in understanding the process of business model innovation and the practical aspects of digital entrepreneurship in SMEs (Andersen et al., 2022). Currently, volatility, uncertainty, complexity, and ambiguity (VUCA) have emerged as prominent features of digital markets. Organizations must adapt their structures to accommodate rapid changes and increasingly complex environments (Cousins, 2018). Under typical circumstances, mature SMEs often engage in developing new business models with the goal of either diversification or replacing an existing model that is declining (Snihur & Wiklund, 2019). Moreover, SMEs demonstrate strategic maneuverability, resilience, and flexibility, allowing them to swiftly adapt to uncertain conditions (Priyono et al., 2020). Digital transformation aids businesses across various processes including design, manufacturing, marketing, sales, and promotion, facilitating the adoption of a data-driven management approach (Ulas, 2019). From 2016 to 2022, the proportion of SMEs in China will surpass 90% of all firms in the country. The phrase "five, six, seven, eight, nine" refers to the significant contribution that SMEs make to China's economy. It means that SMEs account for 50% or more of tax income, 60% or more of GDP, 70% or more of technological innovation, 80% or more of urban labor employment, and 99.8% of all firms. Furthermore, the percentage is still increasing (Peredy & Feierzhati, 2023).

In Germany, China, India, and Brazil, it was observed that 4000 SMEs that had previously adopted digital technologies created jobs at nearly twice the rate compared to other SMEs (North et al., 2019). Furthermore, digital SMEs may have fewer employees but achieve higher economic outcomes compared to non-digital SMEs (Costa et al., 2023). Thus, organizations must undergo digital transformation and adopt new digital technologies to support their operations and plans in the more complicated and competitive digital market. In a changing society, firms must use digital technology to streamline internal structures and boost production (Yang & Zhou, 2022). In the contemporary digital era, organizations heavily depend on technology and digital tools to streamline their operations effectively (Shao et al., 2022). Moreover, in digital era, regardless of whether they are digital natives or digital immigrants, employees must possess digital fluency in the workplace. This encompasses the capacity to proficiently leverage technology for data manipulation, creative information representation, problem-solving, and the innovation of new products and work methodologies (Colbert et al., 2016). Therefore, it is crucial to assess and evaluate employee performance in the digital era to ensure they possess the necessary skills and competencies to effectively utilize these tools (Haris et al., 2023). Employee performance has consistently been the focal point of discussions surrounding the impact of digital solutions on the sustainable development transformation in SMEs (Fu et al., 2023).

The significant importance of digital technology in job execution has created a "digital workforce", where performance is synonymous with digital performance. Successful digital transformation programs depend on employees' skillful use of digital technologies to improve job performance (Nambisan, 2017; Saldanha et al., 2017). In alignment with the research of scholars, such as Ali-Hassan et al., 2015 and Kuegler et al., 2015, the

definition shares a similar consistency. Shao et al., (2022) and Zhang et al.,(2022) introduced employee digital performance in 2022, dividing it into two dimensions: digital task performance and innovation performance. Digital task performance involves employees using digital technologies to efficiently complete routine and repetitive tasks, while digital innovation performance involves using digital technologies simultaneously to foster innovation and achieve innovative results (Shao et al., 2022; Zhang et al., 2022). Furthermore, research by Shao et al. (2022) has found that the support from senior management significantly affects employee digital performance, mediated through a data-driven culture. Additionally, transformational supervisory leadership with digitized self-efficacy as a mediator also significantly influences employee digital performance. Furthermore, scholars such as Wang et al., (2024a, 2024b) have empirically demonstrated the impact of digital capability and organizational learning on employee digital performance, mediated by employee dynamic capabilities. However, research exploring the impact of HI-HRMP on employee digital performance remains a gap in the current literature.

This study aims to address this issue. As early as 2009, scholars have empirically studied how best HRMPs "how" influence performance. The results indicate that pursuing best HRMPs can lead to better performance (Theriou & Chatzoglou, 2009). Additionally, many past studies on the impact of HRPs on employee performance have focused on human resource policies, such as the implementation of organizational systems related to development, training, selection, recruitment, and compensation (Anzenbacher & Wagner, 2020; Collins, 2021; Guerci et al., 2022; Meier-Barthold et al., 2023; Theriou & Chatzoglou, 2009). However, there has been little research conducted in the context of digitization. In the domain of HRMPs, this study concentrates on HI-HRMP strategies, recognized for their efficacy in empowering core employees tasked with upholding competitive advantages (Rubel et al., 2023). Furthermore, When HI-HRMP strategies are aligned with employee-based resources, they bolster employees' collective attachment and motivation, nurturing the cultivation of human and social capital resources, thereby furnishing the organization with a competitive advantage (Shin et al., 2018). Building upon previous research in the context of digitized markets (Rubel et al., 2017, 2023; Shao et al., 2022; Zhang et al., 2022), this study aims to uncover the "black box" of how HI-HRMP achieves employee digital performance. However, there is variability in the definition of HI-HRMP among scholars. For instance, HI-HRMP may encompass training, compensation, and occupational health and safety (Cahyadi et al., 2022). Gu et al., (2023) utilize the AMO perspective to categorize HI-HRMP into three elements: employee skills, motivation, and involvement. This study adopts the division principle proposed by Rubel et al. (2017) conceptualizing HI-HRMP into five domains: capability development, empowerment, information sharing, recognition, and employee involvement. HI-HRMP refers to practices, policies, and procedures aimed at increasing employee involvement in management decisions, enabling employees to accumulate knowledge and skills, thereby fostering progress (Rubel et al., 2017). In fact, recent research supports the viewpoint that HI-HRMP strategies bring competitive advantages by creating potential rare and valuable human capital (Gu et al., 2023; Paré & Tremblay, 2007; Shin et al., 2018). Moreover, empirical studies indicate that HI-HRMPs enhance innovative performance by fostering employees' adaptability and innovation capabilities

in relation to technology (Rubel et al., 2023). Furthermore, this study not only comprehensively summarizes the impact of HI-HRMPs on employee digital performance at various levels but also demonstrates the mediating mechanism of HI-HRMP in achieving employee digital performance. Therefore, a comprehensive exploration of the impact of HI-HRMP on employee digital performance is of significant research value, especially in the context of digital transformation in SMEs.

Research question 1: does HI-HRMP directly influence employee digital performance?

According to the overall philosophical approach to employer–employee relationships, the potential practices for organizations to formulate specific policies are diverse (Collins, 2021). However, in the digital market, at the practical level, scholars have rarely studied the effective pathways of HI-HRMP on employee digital performance. Although past empirical research has shown that the impact of HRMP on employee performance requires mediation by variables such as technological adaptability (Rubel et al., 2017; Zhang et al., 2022); job satisfaction (Alsafadi & Altahat, 2021); employee health and well-being (Guerci et al., 2022); technological adaptability and employee innovative behavior (Rubel et al., 2023) and so on.

Firstly, it is primarily due to the organization's responsibility and sustained support that elucidates how fostering this discontinuous knowledge creation process based on employee-based resources promotes employee performance (Al-Taweel, 2021; Rubel et al., 2023). Moreover, past research has shown that HI-HRMP serves as a human resource policy that fosters employee attachment to the organization and promotes employee engagement (Rubel et al., 2017). Secondly, research indicates that implementing HCHR strategies may lead to more company-level employee resources and effective management of these resources. Deploying these employee-based resources can result in high performance (Collins, 2021). While past empirical research has demonstrated empirical support for the mediated model of the research framework (HRMP–employee attitudes and behaviors–performance), Previous studies have largely neglected two crucial aspects of the RBV perspective (Collins, 2021). First, the RBV has neglected modern considerations. For instance, the alignment of employee-based resources with management practices is essential for gaining a competitive advantage, enabling the company to efficiently coordinate these resources and enhance performance (Collins, 2021). Therefore, this study will demonstrate the alignment between HI-HRMP and employee attitudes, behaviors, and capabilities. Secondly, previous research has failed to adequately explain why differences in employee-based resources persist among companies that adopt similar company-level HRMPs (Collins, 2021). This suggests that different HRM strategies are likely to result in different manifestations of employee-based resources (Collins & Kehoe, 2017). Namely, the impact of HI-HRMP on the differences in employee attitudes, behaviors, and capabilities. Therefore, this study will also examine the differential effects of the mediating variables (employee attitudes, behaviors, and capabilities) on the relationship between HI-HRM and employee digital performance. Before exploring the relationship between them, this study will first demonstrate whether the second research objectives have significant associations.

Research question 2: do employee attitudes and behaviors, as well as dynamic capabilities, mediate the relationship between HI-HRMP and employee digital performance?

This study replaces employee attitudes and behaviors with competitive attitude and behavior variables in distinct Chinese cultural regions to answer this research problem (Yang, 2020). Competition affects Asian economic growth, and Confucianism is the core cultural value in East Asian nations like China, Japan, and Korea. It is also essential to creating a culture of diligence and commercial productivity (Yang, 2020). Yang (2020) surveyed adults aged 18–64 in China, South Korea, and the Caucasus. Human Research Ethics Committee-approved criteria guided this investigation. Research shows that East Asians (China and South Korea) compete more within organizations (Yang, 2020). Firstly, 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). Secondly, it is primarily because any social science research that is divorced from the specific cultural background of a region will lose its meaning. In other words, the effectiveness of social science research must take into account cultural attributes (Toney et al., 2003). Lastly, past research has also demonstrated that Chinese cultural values, such as the Confucian work ethic and diligence, play a critical role in shaping the attitudes and behaviors of Chinese employees, which, in turn, impact performance (Tsang, 2011). In 2018, Wang et al. (2018) demonstrated that employee competitive attitudes and behaviors influenced employee performance through job crafting.

Furthermore, regarding employee capabilities, in 2020, employee dynamic capabilities were first defined, and subsequently, scholars began to study their significant role in contemporary dynamically changing markets. The concept of employee dynamic capability is based on the theory of dynamic capability theory (Bieńkowska & Tworek, 2020). EDC should be understood as the integration, establishment, and reconfiguration of employee capabilities to respond to rapidly changing environments, directly impacting job performance within the workplace (Bieńkowska & Tworek, 2020; Phan et al., 2022).

Employee dynamic capabilities encompass several dimensions: recognizing environmental changes and identifying opportunities and risks that may impact job performance; adapting to changing environments by taking proactive measures to prevent workplace issues; proactive problem-solving and introducing innovative practices when challenges arise in the workplace; continuous personal development and learning (Bieńkowska & Tworek, 2020). Furthermore, despite the significance of EDC for these organizations, there is a paucity of researchers precisely analyzing the nature and roles in contemporary organizations. This is mainly attributed to the constant evolution and dynamism within modern organizations, resulting in the fluid nature of today's work and workplaces (Bieńkowska & Tworek, 2020). In this context, it becomes imperative to redefine the expectations of modern employees, recognizing them as pivotal organizational assets determining the possibilities for sustainable development (Law et al., 2017; Wolf, 2013). For instance, Gross-Golacka et al. (2020) affirms this perspective, asserting that the intellectual capital of employees enhances

the sustainability of enterprises in SMEs. Through their dynamic capabilities, employees bestow upon the organization a sustainable competitive advantage. Moreover, the concept of employee dynamic capability should emerge to address the research gap necessitating the consideration of employees as essential elements of organizational dynamic capabilities, particularly given their crucial role in organizational sustainable development (Bieńkowska & Tworek, 2020). Therefore, employee dynamic capability should promptly receive scholarly attention. Existing literature offers insights into human resources as one of the factors influencing dynamic capabilities (Singh & Rao, 2016). Furthermore, some scholars have pointed out that in dynamically changing markets, the effect of employee dynamic capabilities on job performance is far greater than that of employee attitudes and behavioral variables (Bieńkowska & Tworek, 2020; Phan et al., 2022; Wang et al., 2024a). However, there is a lack of robust evidence regarding the effectiveness of their relationship, particularly in dynamically changing digital markets. Therefore, this study aims to address this significant gap.

Research question 3: is there a significant difference in the effects of employee attitude and behavior variables compared to employee dynamic capabilities on employee digital performance in digital market?

Building upon the second aspect of the RBV perspective as discussed above, past research has yet to effectively elucidate why disparities in employee-based resources persist among companies that adopt identical company-level HRMPs (Collins, 2021). Therefore, this study seeks to demonstrate three aspects of employee-based resources: attitudes, behaviors, and capabilities. Moreover, in dynamic markets, past research has frequently mentioned that in dynamic markets, employee dynamic capabilities as a mediating variable are superior to employee attitudes and behavioral variables, however, this assertion has not been empirically validated (Bieńkowska & Tworek, 2020; Phan et al., 2022; Tworek et al., 2023). Furthermore, given that this study investigates Chinese SMEs in a specific region of China, a substantial body of research in the influence of Confucian culture in China has indicated that competitive attitudes and behaviors have a positive impact on employee performance (Baumann & Winzar, 2017; Chen & Lin, 2020; Viengkham et al., 2018). However, in the context of the digital market, focusing on Chinese SMEs, further evidence is needed to ascertain whether employee competitive attitudes, behaviors, and dynamic capabilities can positively influence employee digital performance and the magnitude of their effects in Chinese SMEs.

Therefore, based on the three main questions of this study, three objectives are primarily pursued. First, to examine the relationship between HI-HRMP and employee digital performance in SMEs. Second, to examine the mediating effect of employee competitive attitudes, competitive behaviors, and dynamic capabilities in the relationship between HI-HRMPs and employee digital performance in SMEs. Finally, to compare and analyze the differential effects of employee competitive attitudes, behaviors, and dynamic capabilities on employee digital performance, as well as the differential impact of HI-HRMPs on employee attitudes, behaviors, and capabilities. The following section elaborates on the theoretical framework and hypothesis development. The third section covers data

analysis. The final part includes conclusions, discussions, theoretical implications, practical implications, limitations, and prospects.

Theoretical basis and hypotheses development

Theoretical basis

The RBV emphasizes that a firm’s competitive advantage stems from its resources, which are the foundation for its sustained and long-term development. According to this theory, a firm comprises diverse resources, and the accumulation and utilization of these resources determine its competitive advantage (Barney, 2001). Moreover, in a rapidly changing market, the necessary conditions for SMEs to maintain a sustainable competitive advantage are inimitable and non-substitutable resources (Wuen et al., 2021). Furthermore, resources include tangible and intangible assets (Barney, 2001). SMEs lack tangible resources compared to large companies. However, SMEs can quickly adapt to unexpected conditions due to their strategic mobility, resilience, and adaptability (Priyono et al., 2020). Thus, the hallmark of value creation within these environments lies in the widespread utilization of intangible resources. In comparison to tangible assets, intangible resources may inherently harbor superior value (Wales et al., 2023), such as HI-HRMP, and human capital, partly because the ownership of most intangible assets is unclearly defined, making them nearly non-negotiable and challenging to acquire (Barney, 2001; Rubel et al., 2023). However, relying solely on resource combinations cannot fully explain how organizations achieve sustainable competitive advantage. To address this issue, scholars have proposed DCT (Teece, 2018). The DCT emerges as an alternative approach aimed at addressing some inherent limitations of the RBV (Galvin et al., 2014). DCT is an extension of RBV that mediates resource and performance (Rodrigues et al., 2021). DCT provides a framework for businesses to build, integrate, and reconfigure their resources to adapt to quickly changing contexts (Teece et al., 1997).

Furthermore, HRMPs are invaluable intangible resources for SMEs. Their potential to generate sustained competitive advantage and achieve innovation performance can be evaluated by considering their rarity, imperfect imitability, and substitutability (Khan et al., 2021). Additionally, one of the key factors determining a company’s success is the development of its potential workforce. Companies strive to identify and nurture highly motivated employees, thereby creating and maintaining a competitive human resources pool that contributes to job performance (Iskamto, 2020). Therefore, this study has constructed the following research framework (Figs. 1 and 2).

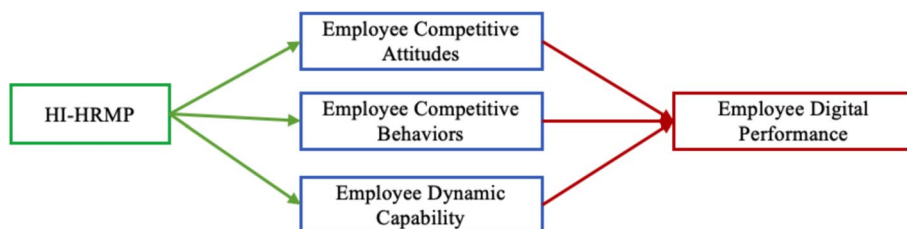


Fig. 1 Research model

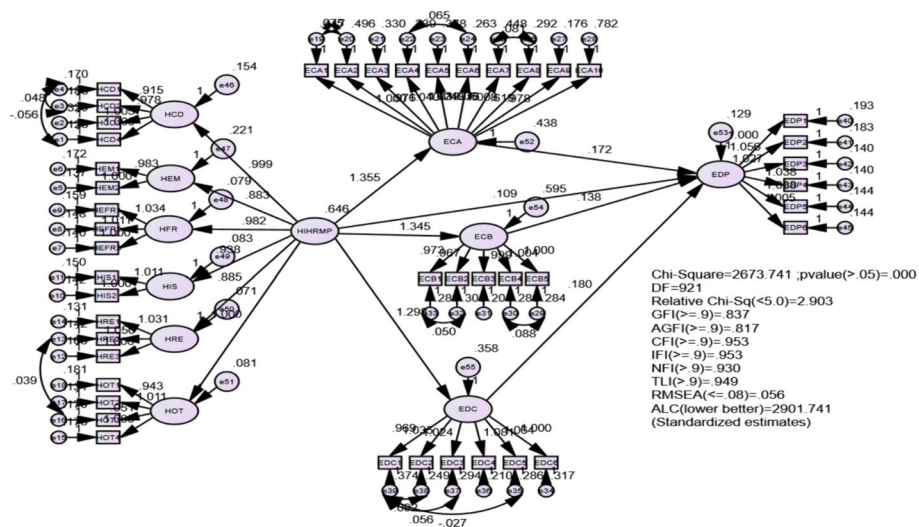


Fig. 2 Structural fit model

HI-HRMP and employee digital performance

HI-HRMPs have evolved from HRMPs and therefore have an HRM function (Macduffie, 1995). HI-HRMP views human resources as a strategic asset, thereby shaping the skills and behaviors of human resources to improve workplace performance (Guthrie, 2001). Research on the relationship between HRMPs and employee performance shows significant differences across various industries. For example, a study of the Malaysian SME sector found that high-performance work practices first promote employee creativity, which in turn affects SME performance (Ismail et al., 2021). Digitalized HRMP enhances employee motivation, which in turn positively impacts employee performance in the Jordanian industrial sector (Al-kharabsheh et al., 2023). Digital HR managers can increase employee engagement and work–life balance by regulating the digital environment of enterprises to positively influence employee performance in the digital era (Sangaji et al., 2022). HI-HRMP affects employee performance in the digital era in a survey of Indonesian SMEs operating in Lubuklinggau (Cahyadi et al., 2022). HI-HRMPs have a positive impact on employee performance in manufacturing firms in Ethiopia (Siraj et al., 2022). HRMP affects employee performance in SMEs in Kosovo (Tahiri et al., 2020). The implementation of HI-HRMPs positively affects employee performance in the banking sector of the Philippines (dela Cruz & Cabaluna, 2022). The positive impact of HI-HRMP on innovative behavior is mediated by emotional commitment and autonomy (Renkema et al., 2021). However, given the differences in research findings across different industries, and the limited exploration of the impact of HI-HRPs on employee performance in digital contexts in Chinese SMEs, it is necessary to further substantiate the effectiveness of their relationship, the study proposes the following hypothesis:

H1: There is a positive relationship between HI-HRMPs and EDP in SMEs.

HI-HRMP and employee attitude, behavior, and dynamic capability

In the overall strategy, human resources policies overlap and reinforce each other, aiming to convey and strengthen consistent signals regarding employer–employee relationships.

They provide clear guidance on how the company develops and supports employees, with the expectation that employees will be rewarded (Meier-Barthold et al., 2023). It is important to note that different human resources strategies consist of unique, complementary human resources policies. These policies work together to convey different information about employer–employee relationships, thus creating unique employee-based resources in different human resources strategies (Stephen, 2024). HI-HRMP is a strategic approach to managing employees. It has been found that it can bring competitive advantage by shaping the relationship between employers and employees, as well as the employee-based resources that result from it (Gu et al., 2023; Shin et al., 2018). The HI-HRMP strategy emphasizes handling employer–employee relationships in a long-term manner, investing significantly in employees, and promoting employee participation (Stephen, 2024). Firstly, Rubel et al.,(2017) empirically demonstrated that HI-HRMPs promote organizational trust and increases employees' adaptability to technology, particularly in the context of private banking industry. High-commitment HRMPs (HCHRMP) show a positive correlation with both in-role and extra-role service behaviors and trust significantly mediates the relationship between HCHRMP and in-role service behaviors in the banking industry of Bangladesh (Rubel et al., 2018). Furthermore, HRMP significantly influences employee performance with job satisfaction as a mediating variable among employees of commercial banks in Jordan (Alsafadi & Altahat, 2021). Moreover, high-performance HRMPs significantly impact employees' health and well-being (Guerci et al., 2022). Rubel et al.,(2023) also demonstrated a significant relationship between HI-HRM and employees' adaptability to technology and innovation capabilities among employees surveyed in the Bangladeshi technology sector. By inspiring a desire to acquire and develop capabilities and flexibility in the workplace, HI-HRMP promotes self-development within the employee resource pool (Gutierrez-Gutierrez et al., 2018).

Additionally, empirical research has demonstrated that HI-HRMPs contribute to the development of dynamic capabilities in SMEs (Apascaritei & Elvira, 2022). HI-HRMPs drive dynamic capabilities in educational enterprises (Arpentieva et al., 2020). In the turbulent digital market, especially when developing HRM solutions, HR managers need to encourage employees to participate in relevant HRM activities and enhance their dynamic capabilities (Rubel et al., 2023). Although there is no empirical evidence, researchers have underlined that HRM approaches boost employee dynamic capability (Bieńkowska & Tworek, 2020; Bieńkowska et al., 2021; Tworek et al., 2023). Al Wali et al., (2023) also mentioned that HRMPs play a crucial role in identifying candidates with high levels of employee dynamic capability through recruitment using psychological tests in public hospitals. Therefore, to address the gap in this research diversity, the following hypotheses are established in this study:

H2a: There is a positive relationship between HI-HRMPs and employee competitive attitude in Chinese SMEs.

H2b: There is a positive relationship between HI-HRMPs and employee competitive behavior in Chinese SMEs.

H2c: There is a positive relationship between HI-HRMPs and employee dynamic capability in Chinese SMEs.

Employee attitude, behavior, dynamic capability, and EDP

Research on the impact of employee work attitudes on employee performance has received extensive validation and support from scholars. Factors such as job satisfaction (Alsafadi & Altahat, 2021), trust and happiness (Guerci et al., 2022), adaptability to technology (Rubel et al., 2023), and loyalty (Khuong et al., 2020) have been examined. Similarly, research on the influence of employee behavior on job performance has been extensively demonstrated by numerous scholars. Factors such as job motivation (Khuong et al., 2020), work–life balance, and innovative work behavior (Le & Le, 2023; Shin et al., 2018; Wongsansukcharoen & Thaweepaiboonwong, 2023) have been explored. Furthermore, past research also tested that Chinese cultural values, such as Confucian work ethic and hard work, play a critical role in shaping the attitudes and behaviors of Chinese employees, which, in turn, impact the performance (Tsang, 2011). Wang et al., (2018) have tested that employee competitive attitudes and behaviors influence employee performance through job reshaping.

Furthermore, there has been an increasing research focus on employee dynamic capability in recent years. For example, employee dynamic capabilities can improve job performance (Bieńkowska & Tworek, 2020). In turbulent market environments, particularly HRM solutions, such as job training, special attention should be paid to employee dynamic capability impacting their job performance (Bieńkowska & Tworek, 2020; Bieńkowska et al., 2021). It can be argued that in high-speed markets characterized by digitalization, selecting and recruiting employees with digital skills can enhance dynamic capability (Proksch et al., 2021). Therefore, building on a specific cultural context in China, this study similarly posits that employee competitive attitudes and behaviors, along with employee dynamic capabilities, significantly influence employee digital performance.

H3a: There is a positive relationship between employee competitive attitude and employee digital performance in SMEs.

H3b: There is a positive relationship between employee competitive behavior and employee digital performance in SMEs.

H3c: There is a positive relationship between employee dynamic capability and employee digital performance in SMEs.

The mediating role of employee attitude, behaviors, and employee dynamic capability

Based on RBV, employee-based resources only yield competitive advantages when aligned with organizational management capabilities, allowing the company to effectively coordinate these resources for productive purposes (Collins, 2021). Moreover, when the HI-HRMP strategy aligns with employee-based resources, it enhances employees' collective sense of belonging and motivation, thereby providing a competitive advantage for the organization (Shin et al., 2018). Past research has shown that HRMPs' impact on job performance depends on employee-based resources as mediating variables. For example: employee inventive behavior acts as a mediator in the relationship between HI-HRMP and technological innovation performance (Rubel et al., 2023). HI-HRMP plays a crucial role in cultivating employees' abilities to adopt or adapt to workplace changes, thereby enhancing organizational performance (Delery & Roumpi, 2017). Job satisfaction plays a mediating role in the relationship between HI-HRMPs and

economic performance (Wood & Ogbonnaya, 2018). Furthermore, HI-HRMP provides employees with autonomy and resources to explore innovative digital solutions. Individuals with stronger innovation capabilities can leverage HI-HRMP to generate and implement creative digital solutions, ultimately enhancing employee performance (Ha et al., 2023).

Furthermore, based on RBV-DCT, DCT is an extension of RBV that mediates resource and performance (Rodrigues et al., 2021). DCT provides a framework for businesses to build, integrate, and reconfigure their resources to adapt to quickly changing contexts (Teece et al., 1997). Therefore, it is crucial to explore how dynamic capability mediates the relationship between HI-HRMP and employee digital performance. Moreover, HI-HRMP involves empowering employees, facilitating their involvement in decision-making, and providing opportunities for skill development (Gu et al., 2023). These practices foster an environment conducive to the cultivation of dynamic capabilities, which consequently positively impact employee performance (Gu et al., 2023). The cultivation of dynamic capability through HI-HRMP leads to improved digital performance outcomes (Rubel et al., 2023). Therefore, based on the findings mentioned above, this study focuses on a specific cultural region in China. Similarly, it suggests that employee competitive attitudes, behaviors, and dynamic capabilities can mediate the relationship between HI-HRMP and employee digital performance. To this end, the following hypotheses are proposed regarding this relationship:

H4a: Employee competitive attitude as a mediating variable positively affects the relationship between HI-HRMP and EDP in SMEs.

H4b: Employee competitive behavior as a mediating variable positively affects the relationship between HI-HRMP and EDP in SMEs.

H4c: Employee dynamic capability as a mediating variable positively affects the relationship between HI-HRMP and EDP in SMEs.

Research methods

Data collection method

This study's data were derived from SMEs across four provinces (Guangzhou, Shanghai, Guizhou, and Anhui), with the survey commencing on August 10, 2023. SME lists were compiled using two methods: accessing SME information websites (www.sme.com.cn) and various channels from the China Administration for Industry and Commerce. The website search revealed that in 2023, 759 SMEs from Anhui were listed in the sixth batch, 2,532 from Shanghai in the fourth batch, 507 from Guizhou in the fifth batch, and 1,200 from Shanghai in the sixth batch. The SME names listed in the database were obtained from official websites (Search results are in Google Cloud Drive: <https://drive.google.com/drive/my-drive>). The survey employed purposive sampling to enhance representativeness, initially selecting 80 SMEs from each region's list (accessible online), totaling 320 potential enterprises. During selection, efforts were made to choose a diverse range of SMEs engaged in digitalization to ensure broad applicability. Additionally, under the assurance of anonymity, the surveyed enterprises were informed about the purpose of the survey, and after obtaining permission, contact emails of SME employees were collected to distribute surveys via the Questionnaire Star platform. As of October 16, 2023, responses were received from 108 companies, representing around

34% response rate. Out of 1,500 distributed questionnaires, 800 were returned, and 200 invalid questionnaires were excluded upon verification, resulting in 600 valid questionnaires (75% response rate). According to the research parameters, statistical analysis by Hooper et al. (2013) suggest that a sample size of 400 or more is adequate. Thus, the 600 valid questionnaires obtained are sufficient to meet the needs of this survey.

The selection of these four provinces as the survey targets is based on several considerations. Firstly, Shanghai is renowned as a financial and economic hub, while Guangzhou serves as a manufacturing and trade center. Meanwhile, Hefei focuses on traditional industries and emerging economies, and Guizhou is currently undergoing a digital transformation phase. Secondly, SMEs in these provinces span various sectors and make significant contributions to the overall economic output, ensuring the representativeness of the sample. The survey questionnaire consists of two parts: the first part covers demographic characteristics and social attributes of the respondents, including gender, age, work area, education level, and number of employees. In this study, established scales were utilized, comprising five latent variables with 47 measurement items (Appendix). These latent variables were measured using a Likert scale from "strongly disagree" to "strongly agree", with scores from 1 to 5 in sequential sequence. This scale was used to assess HI-HRMP, EDC, ECA, and ECB. As for EDP, a 5-point Likert scale was utilized for evaluation. The scales employed in this study followed standard procedures of translation and back-translation.

Descriptive statistical analysis

According to demographic characteristics, most respondents (72.7%) were male. Among the participants, 56.5% fell within the age range of 18 to 25, 15.2% were between 26 and 30, 2.7% were aged 31 to 50, and 4.9% were in the 51 to 60 age group. Less than 5% of the respondents were high school students, 11.7% had completed high school, approximately 72% of the survey participants held a bachelor's degree, and 14.3% possessed a master's degree. The surveyed companies exhibited varied employee counts, with less than 10 employees constituting less than 10%, the employee count between 10 and 49 comprising only 21.8%, and those with an employee count greater than 50 but less than 300 making up 27.5% of the total respondents. Furthermore, companies with an employee count greater than 250 but less than 400 constituted 19.5%, and those with 400 to 1000 employees comprised only 23%. Under the criteria set for SMEs in China, the sample completely aligns with the objectives of this survey (Table 1).

Reliability and validity

After establishing the measurement model, the reliability and validity of the obtained factors were assessed (Table 2). The Cronbach's alpha for each scale exceeded 0.9, indicating strong internal consistency. CR values represent the combination of reliabilities of all measurement items, indicating the internal consistency of the constructs. Higher CR values indicate greater internal consistency of the constructs, with 0.7 being an acceptable threshold (Hair et al., 2014). Therefore, in this study, $CR > 0.958$, which satisfies structural reliability (Table 2). AVE calculates the average variance explained by latent variables to the measured indicators. AVE values above 0.5 indicate convergence

Table 1 Sample descriptive statistical analysis

Basic facts	Categories	Frequency	Percent	Valid percent	Cumulative percent
Gender	Male	436	72.667	72.667	72.667
	Female	164	27.333	27.333	100.000
Age	18–25	339	56.500	56.500	56.500
	26–30	91	15.167	15.167	71.667
	31–40	130	21.667	21.667	93.333
	41–50	26	4.333	4.333	97.667
	51–60	13	2.167	2.167	99.833
	60 above	1	0.167	0.167	100.000
Education	Middle school below	7	1.167	1.167	1.167
	Middle school	7	1.167	1.167	2.333
	High school	67	11.167	11.167	13.500
	Bachelor	433	72.167	72.167	85.667
	Postgraduate students	86	14.333	14.333	100.000
No. of employees	< 10	49	0.082	8.167	8.167
	10 < x < 49	131	0.218	13.833	22.000
	50 < x < 249	165	0.275	10.833	32.833
	250 < x < 400	117	0.195	2.833	35.667
	400 < x < 1000	138	0.230	6.333	42.000
	x > 1000	0	0	0	100
	Total	600	100.000	100.000	

of constructs, with the threshold for acceptance typically ranging from 0.36 to 0.5 (Fornell & Larcker, 1981). As shown in Table 2, the composite reliability scores range from 0.958 to 0.975, while the AVE scores range from 0.793 to 0.864, all surpassing the recommended thresholds of 0.70 and 0.50, respectively. These results indicate the convergent validity and reliability of the measurement model. Convergent validity evaluates whether construct-related items converge with the latent construct. The factor loadings for each construct are statistically significant ($p < 0.001$) and exceed the threshold value of 0.50 (0.619 to 0.944). The factor loadings are statistically significant ($p < 0.001$), with z -values ranging from 23.232 to 44.167 exceeding the crucial limit of 1.96.

Discriminatory validity

Discriminant validity pertains to the lack of correlation or significant distinction between the underlying characteristics represented by one latent variable and those represented by other latent variables. Robust discriminant validity is indicated when the square root of the AVE for each latent variable is greater than the correlation between that latent variable and other latent variables.

This suggests a clear distinction between the latent traits reflected by the indicator variables (Fornell & Larcker, 1981). Table 3 demonstrates that in this investigation, the square root of the average variance extracted for each latent variable is greater than the correlation between that latent variable and other latent variables. Hence, the measurement model demonstrates noteworthy discriminant validity.

Table 2 Reliability and validity

Items	Unstand	S.E.	Z	P	Stand	Cronbach's	CR	AVE
HOT	1				0.952	0.977	0.971	0.849
HCD	0.983	0.037	26.935	***	0.893			
HEM	0.875	0.038	23.272	***	0.834			
HFR	0.985	0.034	29.366	***	0.955			
HIS	0.937	0.033	28.117	***	0.940			
HRE	0.883	0.033	27.102	***	0.947			
ECA1	1				0.893	0.973	0.975	0.798
ECA2	0.975	0.028	34.814	***	0.870			
ECA3	1.035	0.029	35.917	***	0.914			
ECA4	1.021	0.029	35.711	***	0.912			
ECA5	1.006	0.029	34.766	***	0.903			
ECA6	1.037	0.027	37.878	***	0.932			
ECA7	0.976	0.03	32.757	***	0.881			
ECA8	1.008	0.027	36.794	***	0.922			
ECA9	0.619	0.019	32.943	***	0.883			
ECA10	0.983	0.035	28.075	***	0.820			
ECB5	1				0.925	0.971	0.970	0.864
ECB4	1.006	0.02	50.855	***	0.927			
ECB3	1.001	0.023	44.167	***	0.945			
ECB2	0.974	0.024	40.323	***	0.922			
ECB1	0.981	0.024	41.393	***	0.929			
EDC6	1				0.906	0.970	0.969	0.841
EDC5	1.065	0.028	38.421	***	0.924			
EDC4	1.078	0.026	40.669	***	0.941			
EDC3	1.025	0.027	37.512	***	0.916			
EDC2	1.034	0.027	38.942	***	0.928			
EDC1	0.97	0.028	34.095	***	0.887			
EDP1	1				0.864	0.958	0.958	0.793
EDP2	1.056	0.035	30.13	***	0.881			
EDP3	1.028	0.033	31.553	***	0.901			
EDP4	1.038	0.033	31.67	***	0.902			
EDP5	1.038	0.033	31.484	***	0.900			
EDP6	1.005	0.032	31.074	***	0.894			

*** $p < 0.01$

Table 3 Discriminatory validity

	HIHRMP	EDP	EDC	ECB	ECA
HIHRMP	0.921				
EDP	0.780	0.890			
EDC	0.833	0.833	0.917		
ECB	0.768	0.825	0.835	0.930	
ECA	0.815	0.840	0.853	0.876	0.894

Notation: The square root of the average variance extracted for each construct is indicated in bold, while the inter-construct correlations are displayed off the main diagonal

Table 4 Summary of the goodness-of-fit indices of the overall measurement

Fit indicators	χ^2/df	SRMR	RMSEA	GFI	AGFI	IFI	CFI	TLI
Reference	< 3	< 0.080	< 0.080	> 0.900	> 0.900	> 0.900	> 0.900	> 0.900
Test	2.446	0.049	0.054	0.864	0.847	0.964	0.964	0.961

Total model fit

Model fit pertains to the extent of agreement between the hypothetical model and the observed model. Multiple fit indicators were utilized in this study to evaluate the accuracy of the measurement model. Values exceeding 0.9 are commonly regarded as great, whereas values ranging from 0.8 to 0.9 are considered adequate. For instance, GFI, AGFI, CFI, TLI, and NFI are commonly used fit indices. Additionally, discrepancy indices, typically aiming for values below 0.8, with a stricter criterion of 0.05, are also considered, such as RMSEA and SRMR (Iacobucci, 2010). The selection of these fit indices in this study was based on their satisfactory performance in simulation studies (Hu & Bentler, 1999). As shown in Table 4, the results indicate a strong fit between the structural model and the data. Using maximum likelihood estimation in structural equation modeling analysis, the fit indices for the data and model are as follows: $\chi^2(266) = 2673.741$ ($p < 0.001$), CMIN/DF = 2.444, CFI = 0.967, AGFI = 0.847, IFI = 0.941, RMSEA = 0.049, CFI = 0.964, TLI = 0.947. All major fit indices are above or close to 0.9. These results suggest that the proposed HRMP-employee attitude, behavior, and dynamic capability-performance association model is robust both theoretically and empirically. The fit indices all reach satisfactory levels, indicating a good overall fit of the model. Furthermore, in the context of single-factor confirmatory factor analysis, if the fit indices are considerably worse than the original model, it suggests the absence of serious common method bias (Pladevall et al., 2006). From the results of the analyses, there is a significant difference between the original model and the fitted model, in terms of the results of the analyses, and therefore, there is no common methodological bias (Appendix).

Path relation test

This study employed SEM to validate the theoretical hypotheses proposed earlier. SEM allows for controlling measurement errors during model estimation and testing mediation effects by comparing alternative models with the hypothesized model. Regression analyses were conducted first to examine the relationships between HI-HRMP, ECA,

Table 5 Path relationships

Path relationship	Estimate	S.E.	C.R.	P	Estimate	Hypothesis
HIHRMP → ECA	1.355	0.057	23.876	***	0.855	Supported
HIHRMP → EDC	1.298	0.052	24.795	***	0.867	Supported
HIHRMP → ECB	1.345	0.058	23.221	***	0.814	Supported
HIHRMP → EDP	0.109	0.073	1.507	0.132	0.120	Unsupported
ECA → EDP	0.172	0.028	6.241	***	0.298	Supported
ECB → EDP	0.138	0.023	5.915	***	0.249	Supported
EDC → EDP	0.180	0.031	5.815	***	0.295	Supported

*** $p < 0.01$

ECB, EDC, and EDP. Subsequently, path analysis and hypothesis testing were performed on the SEM. Standardized path coefficients between variables (Table 5) indicate significant relationships: HI-HRMP and ECA ($\beta_1 = 1.355, p < 0.01$), supporting hypothesis H2a; HI-HRMP and ECB ($\beta_2 = 1.345, p < 0.01$), supporting hypothesis H2b; HI-HRMP and EDC ($\beta_3 = 1.298, p < 0.001$), supporting hypothesis H2c. However, there was no significant relationship between HI-HRMP and EDP ($\beta_3 = 0.109, p > 0.005$), thus hypothesis H1 is not supported. Furthermore, HI-HRMP has a significant direct effect on EDC ($\beta_4 = 0.250, p < 0.001$), supporting H3. ECA also has a significant relationship with EDP ($\beta_5 = 0.172, p < 0.005$), indicating H3a. The relationship between ECB and EDP is significant ($\beta_7 = 0.138, p < 0.001$), supporting H3b. Similarly, EDC and EDP are significantly related ($\beta_6 = 0.180, p < 0.001$), supporting H3c. Therefore, except for the lack of support for the direct effect of HI-HRMP on EDP, all other hypotheses received support.

Mediation model test

To investigate the mediation effects, Hayes suggests that Bootstrap is the most robust method, and it has been fully integrated into AMOS. Bootstrap allows for random sampling any number of times and setting appropriate confidence intervals (Taylor et al., 2008). The fundamental principle of this method is that if the confidence interval does not include zero, there is no mediation effect; if the confidence interval includes zero, there is a mediation effect (Hayes & Rockwood, 2017). In the SEM, this study conducted 1000 iterations of bias-corrected percentile Bootstrap resampling to examine the indirect effects of direct effects. The results are shown in Table 6. The indirect effects of "HI-HRMP-EDC-EDP" and "HI-HRMP-EDC-EDP" are both statistically significant, as their 95% confidence intervals do not include zero. Therefore, H4a, H4b, and H4c are all supported. However, the direct effect path of "HI-HRMP-EDP" does not have statistical significance. Additionally, the mediating paths of "HI-HRMP → ECA → EDP" and

Table 6 Bootstrap-mediated effects test

Path relationship		Point estimate	Product of coefficient		Bootstrapping			
			SE	Z	Bias-corrected		Percentile 95% CI	
					Lower	Upper	Lower	Upper
EIIE	HI-HRMP → ECA → EDP	0.233	0.078	2.987	0.078	0.392	0.074	0.388
SCIE	HI-HRMP → ECB → EDP	0.185	0.065	2.846	0.066	0.321	0.061	0.316
CSIE	HI-HRMP → EDC → EDP	0.234	0.066	3.545	0.115	0.385	0.100	0.366
DE	HI-HRMP → EDP	0.109	0.063	1.730	-0.006	0.239	-0.006	0.240
TIE	EIIE + SCIE + CSIE	0.652	0.058	11.241	0.538	0.761	0.534	0.758
TE	TIE + DE	0.761	0.043	17.698	0.672	0.848	0.673	0.848
EISCEdiff	EIIE VS. SCIE	0.048	0.129	0.372	-0.214	0.305	-0.219	0.298
EICSIEDiff	EIIE VS. CSIE	-0.001	0.113	-0.009	-0.215	0.247	-0.223	0.237
SCCSdiff	SCIE VS. CSIE	-0.048	0.109	-0.440	-0.250	0.168	-0.250	0.167
P1	EIIE/TIE	0.358	0.113	3.168	0.129	0.593	0.127	0.586
P2	SCIE/TIE	0.284	0.109	2.606	0.103	0.528	0.093	0.520
P3	CSIE/TIE	0.358	0.094	3.809	0.186	0.550	0.171	0.538
P4	TIE/TE	0.856	0.079	10.835	0.694	1.008	0.694	1.008

"HI-HRMP → EDC → EDP" each explain 35.8%. Meanwhile, the mediating path of "HI-HRMP → ECB → EDP" explains 28.4%.

Conclusion

The aim of this study is to investigate the relationship between HI-HRMPs and employee digital performance, while examining the mediating role of employee competitive attitudes, behaviors, and dynamic capabilities. Through a survey conducted among Chinese SMEs, the research revealed that HI-HRMPs do not directly impact employee digital performance but rather indirectly influence it through variables such as employee attitudes, behaviors, and dynamic capabilities. Further analysis indicated that the effect of HI-HRMPs on employee competitive attitudes and behaviors is greater than their effect on employee dynamic capabilities. Moreover, the impact of employee dynamic capabilities on employee digital performance is greater than the impact of employee competitive attitudes and behaviors. In conclusion, HI-HRMPs play a crucial indirect role in enhancing employee digital performance, primarily by influencing employee competitive attitudes, behaviors, and dynamic capabilities.

Discussion

Research question 1 indicates that HI-HRMP cannot directly influence employee digital performance. Hypothesis H1 was not supported. The results of this study suggest that HI-HRMP must influence employee digital performance through some intermediate mechanism. This finding is consistent with the results of previous studies in the digital era (Cahyadi et al., 2022; Renkema et al., 2021). This suggests that HI-HRMPs may require some time to have a significant impact on employee digital performance. Employee behaviors and attitudes may need time to adapt and respond to new practices, while changes in digital performance may also take time to be measured (Collins, 2021). This is mostly because employees may exhibit diverse responses to HI-HRMPs, which can be attributed to their unique characteristics, past experiences, motives, and other influencing factors. Thus, it is crucial for organizations to thoroughly comprehend the unique variations among employees to customize and enhance HRMPs, thereby improving digital performance more efficiently.

Research question 2 indicates that employee competitive attitudes, competitive behaviors, and dynamic capabilities mediate the relationship between HI-HRMP and employee digital performance. This suggests that hypotheses H2a, H2b, H2c, H3a H3b H3c, and H4a, H4b, and H4c are supported. Employee competitive attitudes and behaviors, like employee attitudes and behaviors, play a crucial role in mitigating the effects of HI-HRMP on employee digital performance. These results align with comparable findings from prior studies (Delery & Roumpi, 2017; Gu et al., 2023; Rubel et al., 2023; Wood & Ogbonnaya, 2018).

Furthermore, the findings of the Bootstrap mediation analysis demonstrated a high level of consistency in elucidating the mediation effects of employee competitive attitudes and dynamic capabilities, with both factors accounting for 35.8%. Employee competitive behavior as a mediating variable explains 28.4% of the variance. This indicates that effective HRMPs in SMEs can enhance employee digital performance by aligning with employees' attitudes, behaviors, and proactive involvement through the

Table 7 Path relationship

Path relationship	Untand	S.E.	C.R.	P	Stand	Hypothesis
ECA → EDP	0.192	0.034	5.691	***	0.325	Supported
ECB → EDP	0.142	0.031	4.601	***	0.249	Supported
EDC → EDP	0.218	0.031	7.026	***	0.348	Supported

development of employee capabilities, empowerment, internal information sharing, recognition of employee achievements, and full participation in decision-making. Thus, only when employee resources are appropriately aligned with organizational management practices can these employee-based resources effectively contribute to enhancing the performance of SMEs (Collins, 2021). This helps to fill the gap in organizational thinking regarding the RBV. More precisely, SMEs, due to their strategic agility, adaptability, and flexibility (Priyono et al., 2020), should prioritize leveraging employee-based resources to gain a greater competitive advantage.

Research question 3: Regarding the effects of employee competitive attitude and behavior, as well as employee dynamic capability, on employee digital performance. Table 7 illustrates the pathway relationships among them, while Appendix 2 (Fig. 3) presents the analytical model diagram. The conclusions were effectively demonstrated, indicating that the effect of employee dynamic capability ($r_1=0.218$, $p<0.01$) on employee digital performance is greater than the impact of employee competitive attitude ($r_2=0.192$, $p<0.01$) and employee competitive behavior ($r_3=0.142$, $p<0.01$) on employee digital performance. This study's findings are remarkably consistent with the predictions made by past researchers (Alwali, 2023; Bieńkowska et al., 2021; Tworek et al., 2023). The emergence of such conclusions may be attributed to the fact that employee dynamic capability encompasses various aspects such as perception of the external environment, adaptability, and agility, all of which play a role in different work scenarios. In contrast, employee competitive attitude and behavior may be more influenced by specific environments and competitors, thus exerting a relatively smaller impact on digital performance.

Regarding the impact of HI-HRMP on employee attitudes, behaviors, and dynamic capabilities, the pathway relationships can be inferred from Table 5. Specifically, HI-HRMP exhibits significant relationships with employee competitive attitude (ECA) ($r_1=1.355$, $p<0.01$), employee competitive behavior (ECB) ($r_2=1.345$, $p<0.01$), and employee dynamic capability (EDC) ($r_3=1.298$, $p<0.01$). HI-HRMPs may have a more direct impact on employee attitudes and behaviors because these practices often directly influence employees' perceptions and psychological states. For instance, capability development and recognition may enhance employees' confidence and self-esteem, thereby prompting them to adopt a more proactive attitude towards competition and engage in more active competitive behaviors. Sharing and empowerment make it easier for employees to access competitive-related information and have more opportunities to learn the skills and knowledge required for competition. Therefore, they may be more inclined to actively participate in competition. However, employee dynamic capabilities may be influenced by various factors, including individual qualities, work environment, organizational culture, and so on. Thus, even if HI-HRMPs have an impact on employee dynamic capabilities, their effects may be overshadowed by other factors, resulting in a smaller impact observed in the study.

Theoretical contributions and practical implications

Theoretical contributions

This study further indicates that employee-based human capital is a valuable resource that helps explain how HI-HRMP enhances employee digital performance. The research theoretically addresses two key issues. Firstly, it tackles all the prerequisites of the RBV, with particular emphasis on the uniqueness of HRMP and the existence of long-term competitive advantages based on employee resource differences among firms. Importantly, while adopting a comprehensive human resource strategy across a company may be easily imitated and adopted, consistently executing these strategies to ensure all employees have a similar experience is complex and difficult to replicate. Secondly, the construction of this research framework (HRMPs–employee attitudes, behaviors, and capabilities–performance) enriches the development of HRM theory. During the HRM process, enterprises in different countries or regions can explore various HRM strategies tailored to their cultural and humanistic characteristics to optimize internal HRM. For example, Rubel et al.,(2017) found in their study of the banking sector in Bangladesh that high-commitment human resource management programs (HCHRMP) can increase trust among organizational employees. Thus, this research framework provides a theoretical basis for effectively implementing HRM and serves as a theoretical guide for organizational management strategies in the digital age. Finally, this study demonstrates that the dynamic capabilities of employees have a greater impact on employee digital performance in the rapidly changing digital market than the variables of employee attitudes and behaviors. This extends the applicable scenarios for dynamic capabilities and substantiates the significant contribution of employee dynamic capabilities to employee digital performance in the digital age.

Practical implications

The findings of this study can assist businesses, especially SMEs in China, in recognizing the importance of implementing HI-HRMPs for enhancing employee digital performance. Understanding the mediating effects of employee attitudes, behaviors, and dynamic capabilities can guide HR managers in designing more effective HR strategies to address the specific needs and challenges of the digital market. By identifying the differential impact of employee-based resources on digital performance, businesses can prioritize investments and resources to maximize the overall impact of the digital era on performance. Ultimately, this research will contribute to the development of employee-based human resource planning, thereby facilitating organizational success in an increasingly digitalized environment. The research findings provide guidance for organizations, emphasizing the importance of focusing on and fostering employee attitudes, behaviors, and dynamic capabilities to enhance digital performance. For instance, HR managers can promote employee capability development, empower them, facilitate internal information sharing, recognize their contributions, and encourage active participation in organizational decision-making and management practices through effective HRMPs. Given the significant impact of employee dynamic capabilities on digital performance, businesses should strengthen efforts to cultivate and develop these capabilities among employees. This involves enhancing employees' perception of external environments, their adaptability to change, and their ability to seize market opportunities to effectively navigate and respond to the evolving competitive landscape.

Future research

The study's sample was limited to SMEs in China, which may restrict the generalizability of the findings. Future research could consider expanding the sample to include different types of enterprises to achieve broader applicability of the conclusions. Additionally, this research relied on questionnaire surveys and statistical analysis methods, which may introduce biases such as self-reporting and recall bias. Future studies could incorporate more qualitative research methods to gain deeper insights into the intricacies and complexities of the practice.

Furthermore, this study effectively demonstrates that in the era of digital transformation, HI-HRMPs can foster the emergence of employee-based resources and enhance the digital performance of employees in Chinese SMEs. However, the applicability of HI-HRMP to other countries and different industries requires further validation. Additionally, different types of HRMPs can be explored based on the cultural environments and humanistic characteristics of various countries and regions to customize management approaches. For example, high-commitment HRMPs and strategic HRMPs. In addition, this study is grounded in the specific cultural context of China, with employee competitive attitudes and behaviors serving as mediating variables. Yet, the cultural environments of different countries and regions vary significantly (as discussed in the introduction section). Therefore, future research might explore additional variables based on regional cultural characteristics to optimize corporate management and achieve optimal performance. Variables such as employee attitudes (job satisfaction, well-being, sense of belonging), employee behaviors (innovation, proactivity), and digital dynamic capabilities could be examined. Lastly, the study categorized employee digital performance into two types, task performance, and innovation performance. However, the research did not differentiate the effects of HI-HRMP and mediating variables on task performance and innovation performance. Therefore, future research should specifically investigate their differences.

Appendix

Appendix 1

See [Table 8](#)

Table 8 Scale construct

No.	HI-HRMP	Source
1	Competency development (CD): Formal training and competency development activities are available in my organization	(Rubel et al., 2017)
2	Competency development (CD): Comprehensive training and development programmer are available in my organization	
3	Competency development (CD): My organization has training programmers for new hires	
4	Competency development (CD): My organization provides training and competency development for problem-solving ability	
5	Competency development (CD): Formal training and competency development activities are available in my organization	

Table 8 (continued)

No.	HI-HRMP	Source
6	Empowerment (EMP): I am given considerable latitude for the organization of my work	
7	Empowerment (EMP): I have considerable freedom regarding the way I carry out my work	
8	Fair rewards (FR): I estimate my rewards as being fair internally	
9	Fair rewards (FR): My reward is fair in comparison with what is offered for a similar job elsewhere	
10	Fair rewards (FR): My reward level adequately reflects my level of responsibility in the organization	
11	Information sharing (IS): I am regularly informed of my performance	
12	Information sharing (IS): I am regularly informed of updated information of my organization	
13	Recognition (REC): When I do good quality work, my organization appreciates me	
14	Recognition (REC): My supervisor tangibly recognizes my efforts in different ways	
15	Recognition (REC): My colleagues congratulate me in recognition of my efforts	
16	Organizational trust (OT): Management at my organization is sincere in its attempts to meet the workers' point of view	
17	Organizational trust (OT): My management can be trusted to make sensible decisions for the organization's future	
18	Organizational trust (OT): My management at work seems to do an efficient job	
19	Organizational trust (OT): I feel quite confident that my organization will always try to treat me fairly	
20	Organizational trust (OT): Management at my organization is sincere in its attempts to meet the workers' point of view	
	Employee competitive attitude	
1	I enjoy competition because it gives me a chance to discover my abilities	(Menesini et al., 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	

Table 8 (continued)

No.	HI-HRMP	Source
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	Bierkowska & Tworek, 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	
	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	

Appendix 2

See Figs. 3, 4 and 5

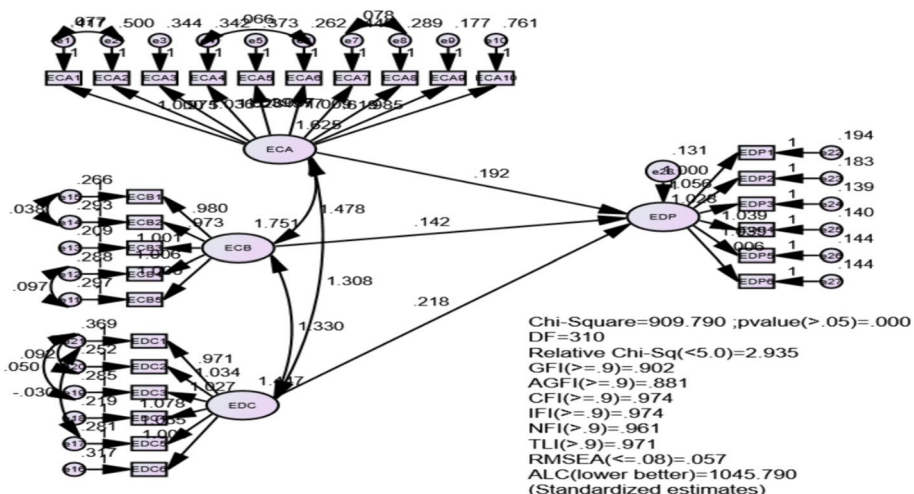


Fig. 3 Structural mode

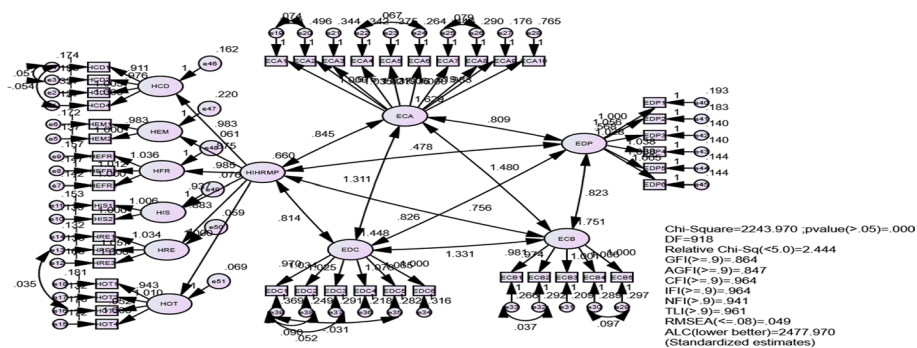


Fig. 4 Total fit mode

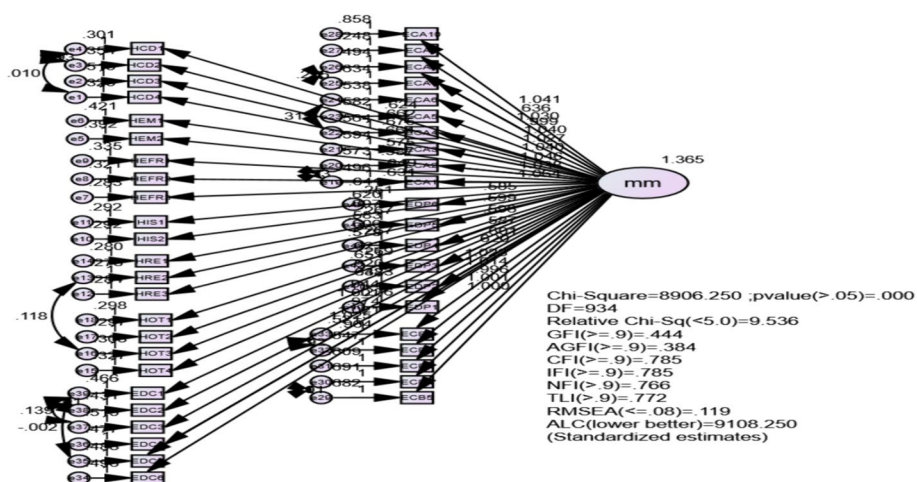


Fig. 5 Fit mode

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Author contributions

Conceptualization, methodology, investigation, project administration, review, and editing. NN: software, validation, visualization, and statistical analysis, supervision, resources, investigation. SBSM: data curation, formal analysis, original draft writing, proofreading, grammar editing, and overall review. GVJ: conceptualization, review and editing, visualization, formal analysis. All authors read and approved the final manuscript.

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Availability of data and materials

Authors gathered data through questionnaire. Declarations Informed consent All study participants provided informed consent.

Declarations

Ethics approval and consent to participate

This study was reviewed and approved by the Research Ethics Committee of Putra Malaysia University with reference number: JKEUPM-2024-061. All participants provided informed consent to participate in the study.

Consent for publication

All participants involved in this study have provided their informed consent for the use of their data in academic research and for publication in research papers.

Competing interests

We are hereby declaring that there are “No Competing interests.”

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