MODERATING ROLE OF COMPETITIVE CLIMATE AND MEDIATING ROLE OF EMPLOYEE DYNAMIC CAPABILITY IN DIGITAL PERFORMANCE AMONG EMPLOYEES IN CHINA'S SMEs

By

WANG GUIFANG

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Doctor of Philosophy

February 2025

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

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February 2025

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Since COVID-19, organisations have increasingly adopted digital technologies to enhance competitiveness, particularly in Chinese small and medium-sized enterprises (SMEs). Employees play a pivotal role in digital transformation by leveraging digital tools to innovate and adapt. However, research on employee digital performance remains limited, especially in dynamic digital markets. This study, grounded in Resource-Based Theory and Dynamic Capability Theory, examines the impact of organisational support variables which are resources with valuable, rare, inimitable, non-substitutable characteristics (digital leadership, digital capability, High-involvement human resource management practices (HI-HRM), and organisational learning) on employee digital performance. The study also used employee dynamic capability as a mediator and competitive climate as a moderator. This study used purposive sampling, data was collected from employees in technology-based SMEs in four regions of China (Shanghai, Guangdong, Guizhou, and Anhui). After screening, 551 valid samples were analysed using structural equation modelling (SEM). The

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results indicate that employee dynamic capability plays a crucial mediating role between organisation support variables and employee digital performance, and digital leadership, HIHRM practices and digital capability have no direct impact on employee digital performance which indicates that employee dynamic capability plays a pivotal mediating role in translating those organisational efforts into improvements in employee digital performance. Moreover, organizational learning has a direct and indirect effect on employee digital performance, highlighting the critical role of learning mechanisms within SMEs. In addition, the competitive climate moderated the relationship between employee dynamic capability and employee digital performance, which emphasises the need for context-aware approaches in enhancing employee digital performance. However, digital leadership neither directly impacts employee digital performance nor mediates through employee dynamic capability. This may stem from employees' limited understanding of leadership strategies and the resource constraints of SMEs. The research framework in this study anticipate to expands the application of dynamic capability theory to new contexts and underscores the necessity for organizations to acquire resources with Valuable, Rare, Inimitable, Non-substitutable characteristics to stimulate employee dynamic capabilities and drive digital transformation, particularly in an increasingly turbulent digital market. Furthermore, the findings indicate that within a certain range, as competitive intensity increases, employee dynamic capabilities are enhanced. Consequently, for policymakers and managers, fostering an appropriate competitive climate within organizations is a critical and should not be overlooked. Finally, this study, which was conducted with an in-depth analysis, provides significant information for industrial development especially for the four surveyed regions. In conclusion, this study suggests that SMEs in dynamic digital markets must cultivate employee dynamic

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capability beyond relying on resources in dynamic market. This study also supports the understanding of how differences in regional digital economic conditions influence the digital transformation of SMEs.

Keywords: Competitive Climate, Digital Capability, Employee Digital Performance, Employee Dynamic Capability, High-involvement Human Resource Management Practices

SDG: GOAL 8: Decent Work and Economic Growth; GOAL 9: Industry, Innovation and Infrastructure

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Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

PERANAN MODERASI IKLIM KOMPETITIF DAN PERANTARAAN KEUPAYAAN DINAMIK PEKERJA DALAM PRESTASI DIGITAL DI KALANGAN PEKERJA PKS DI CHINA

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Sejak pandemik COVID-19, organisasi semakin giat mengadaptasi teknologi digital untuk meningkatkan daya saing, terutamanya dalam perusahaan kecil dan sederhana (PKS) di China. Pekerja memainkan peranan penting dalam transformasi digital dengan memanfaatkan alat digital untuk berinovasi dan menyesuaikan diri. Namun, penyelidikan mengenai prestasi digital pekerja masih terhad, khususnya dalam pasaran digital yang dinamik. Kajian ini berasaskan Teori Berasaskan Sumber (*Resource-Based Theory*) dan Teori Keupayaan Dinamik (*Dynamic Capability Theory*) meneliti kesan pembolehubah sokongan organisasi dengan ciri-ciri sumber yang Bernilai (*Valuable*), Jarang (*Rare*), Sukar Ditiru (*Inimitable*), dan Tidak Boleh Digantikan (Non-substitutable) (kepimpinan digital, keupayaan digital, amalan penglibatan tinggi pengurusan sumber manusia dan pembelajaran organisasi) terhadap prestasi digital pekerja, dengan keupayaan dinamik pekerja sebagai perantara dan iklim persaingan sebagai pemoderasi. Menggunakan persampelan bertujuan, kajian ini meninjau pekerja perusahaan kecil dan sederhana berasaskan teknologi di empat

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wilayah di China (Shanghai, Guangdong, Guizhou, dan Anhui), memperoleh sebanyak 551 sampel yang sah. Pemodelan persamaan berstruktur digunakan untuk menganalisis data. Hasil kajian menunjukkan bahawa keupayaan dinamik pekerja memainkan peranan perantaraan yang kritikal antara pembolehubah sokongan organisasi dan prestasi digital pekerja. Kepimpinan digital, amalan penglibatan tinggi pengurusan sumber manusia, dan keupayaan digital tidak memberi kesan langsung terhadap prestasi digital pekerja, menandakan bahawa keupayaan dinamik perkerja adalah faktor utama yang menerjemahkan usaha organisasi kepada peningkatan prestasi digital pekerja. Selain itu, pembelajaran organisasi mempunyai kesan langsung dan tidak langsung terhadap prestasi digital pekerja, yang menekankan kepentingan mekanisme pembelajaran dalam perusahaan kecil dan sederhana. Iklim persaingan juga memoderasi hubungan antara keupayaan dinamik pekerja dan prestasi digital pekerja, menunjukkan keperluan pendekatan peka konteks dalam usaha meningkatkan prestasi digital pekerja. Namun, kepimpinan digital tidak memberi kesan langsung kepada prestasi digital pekerja dan juga tidak berfungsi sebagai perantara melalui keupayaan dinamik pekerja. Ini mungkin disebabkan oleh pemahaman pekerja yang terhad terhadap strategi kepimpinan serta kekangan sumber dalam perusahaan kecil dan sederhana, yang menghalang keberkesanan kepimpinan digital Oleh itu, pembinaan kerangka penyelidikan ini memperluaskan aplikasi teori keupayaan dinamik ke dalam konteks baharu dan serta menekankan kepentingan organisasi memperoleh sumber dengan ciri-ciri bernilai (*valuable*), jarang (*rare*), sukar ditiru (*inimitable*), dan tidak boleh digantikan (*non-substitutable*) bagi merangsang keupayaan dinamik pekerja serta memacu transformasi digital, khususnya dalam pasaran digital yang semakin tidak menentu. Tambahan pula, dapatan kajian menunjukkan bahawa dalam tahap tertentu, peningkatan intensiti persaingan dapat

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memperkukuh keupayaan dinamik pekerja. Oleh itu, bagi pembuat dasar dan pengurus, pemupukan iklim persaingan yang sesuai dalam organisasi merupakan faktor kritikal yang tidak boleh diabaikan. Akhirnya, kajian ini menjalankan analisis mendalam mengenai keadaan pembangunan industri di wilayah yang dikaji daripada perspektif pemerkasaan digital, sokongan dasar, pengagregatan bakat, dan persekitaran persaingan. Berdasarkan kesimpulan kajian, cadangan dan langkah penyelesaian yang bersasar dicadangkan untuk menangani jurang pembangunan digital antara wilayah. Kesimpulan kajian ini turut menegaskan bahawa PKS dalam pasaran digital yang dinamik mesti memupuk keupayaan dinamik pekerja menjangkaui kebergantungan pada sumber-sumber dalam pasaran dinamik. Kajian ini juga memberikan pemahaman bagaimana perbezaan dalam keadaan ekonomi digital serantau mempengaruhi transformasi digital PKS.

Kata Kunci: Iklim Persaingan, Keupayaan Digital, Prestasi Digital Pekerja, Keupayaan Dinamik Pekerja, Amalan Penglibatan Tinggi Pengurusan Sumber Manusia

SDG: MATLAMAT 8: Pekerjaan yang Baik dan Pertumbuhan Ekonomi; MATLAMAT 9: Industri, Inovasi dan Infrastruktur

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LIST OF ABBREVIATIONS

DL	Digital Leadership
DC	Digital Capability
OL	Organisational Learning
EDC	Employee Dynamic Capability
EDP	Employee Digital Performance
SME	Small and Medium-sized Enterprise
RBT	Resource-based Theory
DCT	Dynamic Capability Theory
HI-HRMP	High-involvement Human Resource Management Practice
VRIN	Valuable, Rare, Inimitable, Non-substitutable
VUCA	Volatility, Uncertainty, Complexity and Ambiguity

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Digital technology has changed workplace design, execution, and management. This emphasises the importance of understanding how digitalisation affects organisational goals (Duan et al., 2023). Literature on small and medium-sized enterprises (SMEs) has been criticised for providing fragmented and inconsistent results, lacking a widely accepted model for achieving employee digital performance (EDP). The wide variety of antecedents, performance dimensions, and moderators hinder comparability and theory development; hence, creating a need for more integrated frameworks and conceptualisations that offer a more comprehensive understanding of SME-related performance (Kafetzopoulos, 2022).

This chapter discusses the current situation, challenges, and digital development context of Chinese SMEs, providing a comprehensive overview and issues related to the digital development of SMEs. It proposes a human resource-centred research pathway to achieve EDP, emphasising that SMEs can only overcome development barriers in a dynamic marketplace by adopting a human capital-centred development strategy. This chapter presents the background of the study, outline of the research framework, methodology, gaps, theoretical and practical implications, definitions of key terms, and finally, the organisational structure.

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1.2 Background of the Study

In today's competitive and challenging international economic environment, a viable and dynamic SME sector is crucial for a nation's economic advancement (Tolossa et al., 2024). SMEs are instrumental in driving innovation, employment, and economic development in both developed and developing countries. They are regarded as the engine for sustainable economic development and are vital for poverty alleviation and regional development (Kongolo, 2023). However, COVID-19 had a devastating effect on the global socioeconomic system. The pandemic has led to long-lasting social and economic crises that undoubtedly, have also greatly affected SMEs (Hai-Ninh et al., 2024). The pandemic has triggered supply and demand shocks that disrupted SMEs' business operations(Lei et al., 2022). Since February 2020, the Organisation for Economic Co-operation and Development (OECD) has surveyed more than 180 SMEs in 32 countries, revealing that 70-80% SMEs have experienced a significant decline in sales. Several polls indicate drops of 30-50 % (OECD, 2022).

In today's volatile, uncertain, complex, and ambiguous (VUCA) business environment, organisations must adapt to the rapid changes and a more complex environment (Shet, 2024), particularly with regard to the use of technology. In 2022, the OECD and the World Bank surveyed the Future of Business and found that around 40% of the SMEs admitted that the epidemic has permanently changed their use of technology (OECD, 2022). According to Casciani et al. (2022), digital transformation has become fashionable, with firms in every industry beginning to focus on improving digital technology. In other words, digital transformation is transforming enterprises, which involves digitalising work processes, increasing organisational flexibility, and

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developing new skills. These transformations have been hastened by COVID-19 (Al-Edenat, 2023).

In 2023, digitally advanced enterprises were expected to generate 32% of digital performance through digital means, while digital-first industries were anticipated to produce 48% of their sales through digital channels in China (Peng, 2022).The research suggests that it is important for SMEs to involve themselves in digital transformation to expand and reach global businesses (Melo et al., 2023), increase productivity, improve performance, and foster innovation (Peng & Tao, 2022). Studies indicate that the development of digital transformation is a key factor in distinguishing high-performance enterprises from low-performance enterprises as it enables businesses to identify new opportunities more proactively and swiftly. Additionally, research reports suggest that organisations undergoing digital transformation can potentially reduce customer acquisition costs by 47% and increase revenue by approximately 8% (Lathabhavan & Kuppusamy, 2023). Digital technology has also made SMEs more dynamic, innovative, and competitive (Abbas et al., 2019), and if SMEs do not leverage digital technologies to identify additional value-creation opportunities, they will struggle to progress (Rupeika-Apoga, Bule, et al., 2022).

Therefore, China's "14th Five-Year Plan" (2021-2025) was developed to promote the digital economy with special actions to empower SMEs digitally (Zhang & Bu, 2024). Specifically, it places a strong emphasis on leveraging digital technology to enhance the capabilities of SMEs, ensuring that they have access to high-speed and reliable internet (Creemers et al.,2022). Secondly, providing research and development (R&D) funding support is crucial for fostering innovation within SMEs; hence, offering

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training programmes to enhance the digital skills of SME staff ensures that they can effectively utilise new technologies (Zhou et al., 2022). Finally, it is essential to create a more favourable environment for digital innovation to ensure the development of SMEs. This includes protecting SMEs from digital threats and ensuring the security of their data (Lei et al., 2022). Therefore, by focusing on digital infrastructure, transformation, innovation, skill development, financial support, and cybersecurity, this plan aims to create a conducive environment to ensure SMEs continue to thrive in the digital age (Creemers et al., 2022).

The recent rise of China's digital economy has had a significant impact on the digital transformation of industries (Song et al., 2022). For example, China's digital economy has experienced sustained rapid growth, with an average annual growth rate of 16.6% between 2015 and 2020. With a scale second only to the United States, this growth is the fastest globally, reaching a staggering 6.07 trillion USD and representing 38.6% of the global economic output (Chen et al., 2022; Su et al., 2021). Figure 1.1 shows that China's total digital economy scale has expanded from 9.5 trillion yuan in 2011 to 45.5 trillion yuan in 2021, nearly quintupling over the past decade[1].

[1]School of Labour and Human Resource, Renmin University of China. A report on job structure and job quality in Ali ecosystem (in Chinese), 2020; https://bit. ly/3vLG1be.

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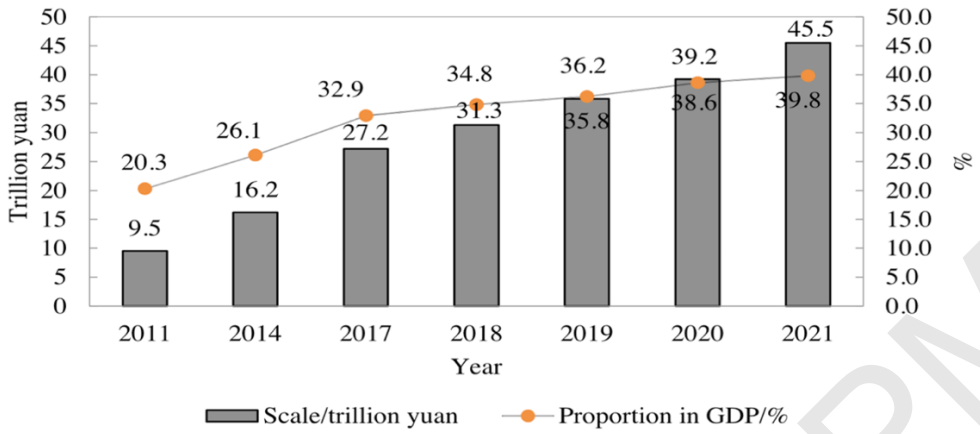

Figure 1.1 : Overall Scale of China's Digital Economy and Its Proportion to GDP2

However, statistics indicate that the level of digital economic development varies across the different regions in China. The Northern Coastal Economic Zone (Shanghai) and the Eastern Coastal Economic Zone (Guangdong) show higher digital economic development levels compared to the national average. In contrast, the Middle Yangtze River Economic Zone (Anhui) displays a moderate level of digital economic development, while the Southwestern Economic Zone (Guizhou) displays a relatively lower level of digital economic development (Li & Liu, 2021). Despite these differences, research indicates that from 2011 to 2020, China's provincial digital economies have experienced steady growth. The spatial distribution of the digital economy is higher in eastern provinces and cities such as Shanghai and Guangdong, while in central (Anhui) and western provinces (Guizhou) and autonomous regions, it is relatively lower. With the strong support of the Chinese government, these regions

[2]Data source: China Academy of Information and Communications released the white paper on China's digital economy development.

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possess considerable potential for digital economic development (Li & Liu, 2021; Luo & Zhou, 2022; Tang et al., 2024; Wang et al., 2022).

In terms of enterprise scale, the digital transformation performance of small enterprises significantly lags that of medium-sized enterprises. 30.21% of small enterprises have a basic understanding of digital transformation although it is significantly higher than that of medium-sized enterprises (15.31%). This indicates that the majority of Chinese SMEs are lagging in digital transformation (Yu & Liu, 2022).

Digital transformation also presents a complex array of challenges that can redefine the market, operational efficiency, and the overall competitive dynamics within which these SMEs operate (Bansal et al., 2023). Due to external factors, digital technology resources for SMEs are primarily supported by third-party platforms led by the government and large enterprises (Jia et al., 2024). Compared to large enterprises, SMEs occupy a weaker position in the industrial chain, with limited access to external resources. However, research on the prerequisites for digital transformation in large enterprises cannot be directly replicated and applied to SMEs (Jia et al., 2024).Thus, the greatest challenge faced by SMEs is to leverage external digital resources to drive their development. Research indicates that lack of management skills and talent are the most critical factors hindering digital transformation in SMEs (Hendrawan et al., 2024; Zhang et al., 2024). Consequently, the utilisation of internal intangible resources, particularly human resources, emerges as the key breakthrough for SMEs to achieve digital transformation (Ramdani et al., 2022). Lack of prioritisation on digital capability (DC) development within organisations has become a major constraint that

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hinders the growth of SMEs in China (Zhang et al., 2024). Although digital technology resources can easily be replicated, unique firm-specific capabilities cannot be easily assembled through the market (Jia et al., 2024). As internal organisational capabilities can be a source of sustained competitive advantage (Jahanshahi et al., 2021), SMEs must acquire and develop a combination of digital strategy, digital capability (DC), and HRMP to create a resource base that is difficult to imitate and transfer (Yu & Liu, 2022).

Data from 2022 show that 29.1% of Chinese SMEs require their top management to improve their awareness of digital transformation, suggesting that senior management's understanding of digital transformation is one of the best ways for SMEs to overcome its challenges (Zhang & Bu, 2024)[3]. Data also show that a lack of a digital strategy may result in ill-considered choices and resource waste (digital resource) in SMEs (Yu & Liu, 2022). Moreover, due to the dispersed distribution of SMEs across various regions in China and the significant variations in digital development levels among SMEs as highlighted by the statistical data indicates that Chinese SMEs encounter prominent challenges in their digital development processes including strategy (leadership), resources, HRMP, digital capability (DC), and environmental factors (Su et al., 2023; Zhang & Bu, 2024; Yu& Liu, 2022).

Past research indicates that in addition to organisational support factors (strategy, digital resources, and HRMP), digital transformation often depends on employees' skills, mindset, and capabilities (Blanka et al., 2022). Digital technology also triggers

[3] Data source: China National Institute for Standardisation of Electronic Technology's SMEs' Digital Transformation Analysis Report (2021).
[2] Data from Tencent Research Institute-SMEs' Digital Transformation Development Report (2022)

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issues related to employee well-being such as stress and work-life conflict which impede financial returns (Hasyim & Bakri, 2025). Organisations with issues with digital technology, for instance, have as high as 44% of executives who lack digital talent, and this is viewed as a primary obstacle to digital transformation[4]. In China, millennials (born between 1980 and 1994) and Generation Z (born between 1995 and 2009) depend on digital technology for jobs[5]. Their attitude towards digital technology brings both opportunities and challenges to traditional enterprises (Bagdi et al., 2023). Therefore, when an organisation wishes to benefit from technological investments, it needs to equip its employees with digital skills (Cirillo et al., 2023). As Nicolás-Agustín et al. (2022) emphasised, "Digital transformation needs a heart," reminding managers not to "forget that it is people who keep the company running. It also indicates that poor management of SMEs may harm relationships with employees (Kozanoglu & Abedin, 2021). Previous research regards employees' ability to utilise digital technology as a critical dynamic capability in an organisation's digital transformation process (Blank et al.,2022).

SMEs also need to effectively utilise digital technology to achieve digital performance as digital transformation is an inevitable trend (Yu & Liu, 2022). There is a consensus in the academic community regarding the significant role of employees in the digital era (Shao et al., 2022; Zhang et al., 2022). Employees should be able to utilise digital technology and handle data, creatively communicate information, solve problems, design new products, and adapt their work methods (Colbert et al., 2016; Purwanto et

[4]Accenture. (2015). Realizing digital transformation: Adapt to future work, stimulate employees' enthusiasm. https://www.accenture.com/documents.
[5]Euromonitor International. How China's Urban Millennials and Generation Z live and spend, 2020; https://www.baogaoting.com/ info/19115.

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al., 2023). In other words, employee performance has been connected to digital performance, also referred to as EDP (Shao et al.,2022; Zhang et al., 2022). The utilisation of digital technology by the new generation of employees to achieve their digital performance symbolises the success of digital transformation (Shao et al., 2022; Wang et al., 2024; Wang et al., 2024; Zhang et al., 2022). Past studies have also indicated that if organisations do not simultaneously prepare their employees to use digital technologies, investments in digital technology are highly likely to fail (Verhoef et al., 2021; Cetindamar et al.,2022).

Chinese SMEs face significant challenges in effectively achieving EDP. One major obstacle is the high cost of digital empowerment (Zhang, 2024). [6]The shortage of skilled talent and rising labor costs are among the most pressing difficulties, accounting for 64.53%. SMEs struggle to attract and retain talent, facing immense pressure that hampers employees' ability to achieve EDP (People's Forum, 2024). Secondly, the rising cost of financing or difficulties in obtaining funding is another severe challenge, accounting for 53.02%. Furthermore, economic uncertainty exacerbates the difficulty of retaining digital talent, ultimately leading to a decline in EDP (Report on the Digital Transformation of Chinese SMEs, 2024). Thirdly, the rising costs of raw materials, logistics, and operations are also major challenges for enterprises, accounting for 52.45%. With increasing instability in global supply chains, raw material prices and logistics costs continue to surge, imposing additional burdens on business operations (Zhang, 2024). [7]SMEs are also facing intensified industry

[6]Survey on the status of digital empowerment of SMEs (People's Forum, 2024)
http://paper.people.com.cn/rmlt/pc/content/202410/16/content_30030014.html

[7]Chinese Government Survey of SMEs
https://www.nxzw.gov.cn/ztzl/sjkf/202403/t20240314_4484829.html

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competition and declining market demand, with respective proportions of 44.91% and 34.91% (Chinese Government Survey of SMEs, 2024). Fourthly, the greatest challenge faced by Chinese SMEs is financial pressure and a lack of financing support, accounting for 60.75% (Zhang, 2024). Additionally, existing business processes do not align with digitalization requirements, necessitating large-scale transformations, with a reported rate of 60.38%. The shortage of professional digital talent is another significant barrier, affecting 32.83% of SMEs. Furthermore, 40.94% of respondents indicated that they understand government policies supporting the digital empowerment of SMEs, but these policies are not effectively implemented and have a slow impact (Report on the Digital Transformation of Chinese SMEs, 2024). These factors contribute to a high employee turnover rate among SMEs. The inability to provide effective training leaves employees lacking essential digital operational skills, ultimately hindering their EDP (Zhang, 2024).

Therefore, in the digital age, both scholars and organisations need to focus on how to effectively achieve EDP. To explore the antecedents of EDP, this study aims to investigate the influence of the antecedent of organisational support variables (OSV) and EDP. Previous research has focused on how organisational support and employee motivation positively enhance employee performance. However, there is a lack of consensus among scholar on how to define employee performance. Vuong et al. (2022) define employee performance as the assessment of an employee's ability to fulfil responsibilities, complete daily tasks, and achieve departmental goals, while Zhang et al. (2022) define employee performance as the quantity and quality of output produced by employees during their work processes. Some scholars define employee performance as the extent to which an individual employee's productivity level meets

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the company's performance standards (Diamantidis & Chatzoglou, 2019; Mohamad et al., 2022). Therefore, previous research on employee performance focused on tangible outcomes (Yee et al., 2021).

According to Shao et al. (2022), EDP refers to the performance level of employees who use digital technology in completing their work. The evaluation criteria and focus of EDP differ from what were used for the traditional employee performance. EDP assesses employees based on the work output generated and the use of digital technology to achieve desired results (Shao et al., 2022). EDP includes both task performance and innovation performance achieved by utilising digital technology; therefore, EDP emphasises both tangible outcomes (task performance) and intangible results (innovation performance)(Shao et al., 2022; Zhang et al., 2022). Based on these definitions, it is evident that there are significant differences in the evaluation criteria between employee performance and EDP. At present, the development of digital technology in China's SMEs presents both opportunities and challenges for managers. One of the key concerns for managers is the enhancement of EDP (Wanget al., 2024; Zhang et al., 2024). EDP, which is shaped by the interaction between organisational support and employee characteristics, is a critical factor in evaluating the level of digitalisation within a company and determining the success of digitalisation efforts (Shao et al., 2022). Therefore, how to transform OSV and enhance EDP are issues that cannot be overlooked (Shao et al., 2022). Organisational support factors are also a primary issue that China's SMEs urgently need to address during the digital transformation process. Due to the limited resources, most SMEs find it challenging to achieve digital performance through digital transformation (Teng et al., 2022).Thus, this study examines SMEs that have already undergone digital transformation to

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identify key factors (resources) influencing their digital transformation. This study aims to enrich and expand the research in the field of digital transformation and contribute to a deeper understanding of SMEs by exploring how organisational support factors influence EDP and revealing the underlying processes.

1.3 Problem Statement

According to reports by Zhang et al. (2024), organisations (54%) reported that the digital talent gap has hindered their digital transformation efforts, leading to delays in innovation and decreased productivity (Zhang et al., 2024). International Data Corporation (IDC) found that due to employees' lack of digital skills, which leads to inefficiency, companies lose 20-30% of their revenue annually (Strietska-Ilina & Chun, 2021). The World Economic Forum predicts that by 2025, 42% of the core skills required for existing jobs will change. However, many employees do not possess the necessary digital skills to adapt to these changes, leading to a decline in productivity (Sart & Yildiz, 2022). Additionally, a study by Burning Glass Technologies stated that employees with advanced digital skills contribute $1.3 trillion more to the U.S. economy's GDP annually compared to those without digital skills (Tee et al., 2024). 86% of IT decision-makers also believe that employees can easily identify and avoid problems, make data-driven decisions, and increase profits by leveraging technology. Zhang et al. (2024) in their studies indicated that managers (91%) consider employees' digital experience to be crucial for operational efficiency (Zhang et al., 2024) and view it as a key factor in determining the overall performance of an organisation. Hence, organisations need outstanding individuals in order to achieve their goals and ultimately gain a competitive advantage (Shao et al., 2022; Zhang et al., 2024).

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In the context of China's rapidly digitalisation economy, SMEs are essential for national economic growth and innovation (Chen et al., 2022). Research reveals that a mere 20% of digital transformation initiatives in Chinese SMEs achieve success, primarily due to constraints in size, strategies, resources, and internal capabilities (Su et al., 2021; Yu & Liu, 2022).

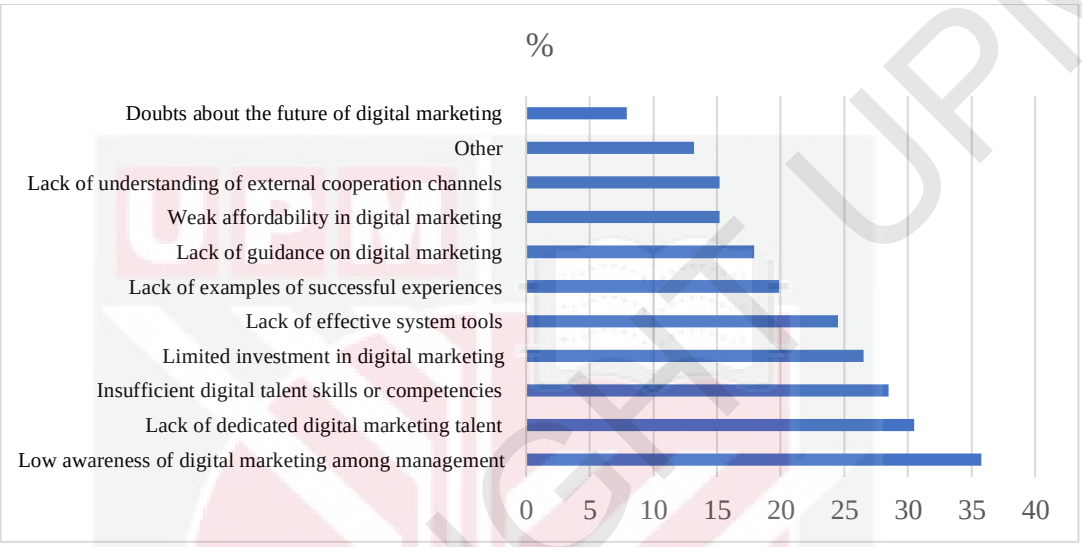

Figure 1.2 : Digital Transformation of Chinese SMEs in 2020
(Source: China SME Digital Development Research Report, 2022 Edition)

Figure 1.2 shows the challenges faced during the digital transformation of Chinese SMEs in 2020 by SMEs digital development. Table 1-1 below displays the statistics on the challenges faced by SMEs in China related to DL, DC, HI-HRMP, and OL.

Table 1.1 : The Challenges of DL, DC, and HI-HRMP in Chinese SMEs

Author	Item	Content
(SME Competitiveness Outlook, 2018)	DL	82% of Chinese SME leaders believe digital technology is critical to the competitiveness of their organisation (Deloitte, 2018).
(Kokot et al., 2023)	DL	SMEs with strong DL are 50% more likely to achieve successful digital transformation (McKinsey, 2021).
(OECD，2022)	DC	34% of EU SMEs have basic or below basic digital skills by 2021 (DESI report, 2022).

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Table 1.1 : Continued

BCG（2021; PwC，2021）	DC	80% of SME executives cite a lack of digital skills as a barrier to their efforts of digital transformation.
(OECD，2022)	DC	The lack of digital skills is considered a significant obstacle to digital transformation for 72% of Chinese SMEs.
(World Economic Forum，2020)	DL	Chinese SMEs are recognising the strategic importance of digital technologies, with 86% of SME CEOs considering digital technologies as crucial for their businesses,
(Gallup survey, 2022）	HRMP	Employee engagement and involvement in decision-making processes in Chinese SMEs are relatively low, with only 42% of employees feeling engaged at work.
(Accenture, 2022)	DC	54% of global SMEs have a low level of digital maturity, indicating a significant gap in digital capabilities
(Grow to Greatness, 2020)	HRMP	SMEs with highly engaged employees have revenue growth rates that are more than twice that of their competitors.
(Charles et al., 2021)	HRMP	SMEs with high levels of employee involvement in decision-making have higher levels of employee satisfaction and productivity
(Alibaba Cloud survey, 2022)	DC	Chinese SMEs face challenges in adopting digital technologies due to limited resources and lack of digital expertise. 47% of Chinese SMEs struggle with a lack of digital talents and capabilities.

(Source: Collated from relevant literature and conferences)

Based on Table 1-1, currently, OSV (DL, DC, HRMP, and OL) is not only the primary challenge faced by SMEs in China but also the most fundamental factors (Song et al., 2022; Yu & Liu, 2022, 2022). Therefore, investigating the impact of these factors on EDP is of utmost significance. Furthermore, a report by Digital China Development Report (2022) stated that an unstable digital foundation, a lack of funding, high operating costs, a lack of incentive for employees to learn new skills, and a lack of competitive advantage in the labour market are the barriers to digital transformation (Cai et al., 2023), which explains the reasons why SMEs struggle with digital transformation. The report further stated that only 15% of SMEs have a digital training

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system (Yu & Liu, 2022) which suggests the need for effective HRM strategies in SMEs (Song et al., 2022).

There is a need for improved organisational management structures and business processes for sustainable digital integration and profitability in Chinese SMEs (China Economic Times, 2022; Yu & Liu, 2022). Specifically, the severe deficiency in employees' digital capabilities exacerbates these limitations as digital capability is crucial for navigating the complex modern digital ecosystem (Cahyono et al., 2023). SMEs must be ready to invest their resources in better strategies, training, and HRMP as those organisational support factors is to help employees complete their tasks more efficiently (Sun et al., 2024). This means that to achieve EDP, organisational support factors are important (Shao et al., 2022; Wang et al., 2024). SMEs need to demonstrate strategic operability, resilience, and flexibility to enable them to make rapid adjustments under uncertain conditions (Wang & Sun, 2024). However, due to the severe resource constraints and considering that tangible assets have limited availability compared to intangible assets, SMEs inherently rely more on intangible resources with VRIN features (valuable, rare, inimitable, and non-substitutable) to maintain sustainable competitive advantages (Seddon, 2014;Le & Liu, 2024).

Research indicates that employees need to leverage their digital skills to achieve EDP since the success of digital transformation in SMEs also signifies the effective achievement of EDP (Saldanha et al., 2019; Shao et al.,2022; Wang et al.,2024). Nevertheless, due to the differences between employee performance and EDP, it is very challenging to explain the mechanisms of EDP (Vuong et al., 2022); Shao et al., 2022; Zhang et al., 2022). Existing research shows that only Shao et al. (2022) have

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conducted preliminary explorations, and their findings suggest that transformational regulatory leadership influences EDP with self-efficacy acting as a mediator and top management support influences EDP with a data-driven culture. Zhang et al. (2022) explored the technological adaptability of EDP (Zhang et al., 2022), while other research focused on the relationship between organisational support factors (strategies, resources, capabilities, and environmental variables) and the mediating variables (employee attitudes and behaviours) in influencing employee performance (Abourokbah et al., 2023; Cahyadi et al., 2022; Iskamto, 2020; Mohamad et al., 2022; Muniroh et al., 2022; Rosmi & Syamsir, 2021). However, these studies overlooked the influence of OSV (DL, DC, OL and HRMP) on EDP, causing the impact of these factors on EDP to remain insufficiently explored.

According to Resource-Based Theory (RBT) and Dynamic Capability Theory (DCT), an organisation can enhance its sustainable competitive advantage by effectively aligning its strategy, resources, and capabilities with its environment (Teece, 2018; Mwange et al., 2025). However, specifically for Chinese SMEs, factors such as strategy, resources, and training related to employees' digital literacy need attention (Chen et al., 2022; Liu & Yu, 2021; Song et al., 2022; Yu & Liu, 2022). This is based on the notion stated by Kraus et al. (2022) which claims that digital transformation for SMEs requires the management to actively innovate and keep pace with the digital era, so organisations can move from traditional leadership to DL to promote sustainable development (Mollah et al., 2023). DL mixes traditional leadership's digital skills with strategic decision-making and digital culture adoption due to the shift towards decision-making data, digital platforms, and service systems. This approach will

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empower digital leaders to excel in sustainable organisational management in the digital age (Zeike et al., 2019).

HI-HRMP, characterised by HRMP features, serves as a critical mechanism for cultivating employees' ability to flexibly perform various tasks in unpredictable environments (Yasir & Majid, 2020). Empirical studies have demonstrated that HI-HRMP can enhance employees' adaptability to digital technologies, thereby improving their performance (Rubel et al., 2017, 2023). Additionally, in a dynamic digital market, DC is seen as a distinct resource to support the innovative performance of SMEs (Kadarusman & Bunyamin, 2021; Rodriguez-Serrano & Martín-Armario, 2019), and it is viewed as a crucial source of sustainable competitive advantage for SMEs (Aramburu et al., 2021).Previous research also suggests that employee learning is not necessarily driven by intrinsic motivation; instead, a supportive management environment plays a crucial role (Fu et al., 2023). Chan et al. (2023) emphasise that employees are compelled to learn new ways of working, primarily because technological innovations are occurring more frequently than ever before. As a result, employees must continuously improve the knowledge and skills required for technological innovation. The emergence of new technologies also necessitates OL to enhance performance in the dynamic and ever-changing digital era (Mollah et al., 2023).

Past empirical research also indicates that in the rapidly changing digital market, OSV (VRIN resources), DC (Aramburu et al., 2021; Li et al., 2022), HI-HRMP (Batt, 2002; Richey et al., 2006; Mathur, 2015), DL (Borah et al., 2022), and OL (Ruoslahti & Trent, 2020; Zhang et al., 2023) contribute not only to sustaining competitive

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advantage but also represent a core challenge faced by SMEs in China today (China SME Digital Development Research Report, 2022). Moreover, when SMEs emphasise DL, DC, HI-HRMP, and OL, innovative capabilities within SMEs will be enhanced (Rubel et al., 2023; Li et al., 2022; Zhang et al., 2023). However, how to effectively achieve EDP by OSV (DL, DC, HI-HRMP, and OL) remains a gap in current research. Therefore, this study aims to investigate the influencing factors for EDP from the perspective of OSV.

Costa Melo et al. (2023) conducted a thorough literature analysis and found that since the COVID-19 pandemic, understanding how the digital transformation process affects SMEs' employee performance has become crucial. Nine prominent academic journals have published papers on this topic, but none has the leading authority. Kafetzopoulos (2022) conducted a thorough literature evaluation of 33 peer-reviewed academic publications from the year 2000 to the year 2020 and found that SMEs' performance was affected by organisational strategy, innovation, human resources, knowledge acquisition, organisational context, and moderating variables (internal and external environment). However, research on mediating variables is scarce (Kafetzopoulos, 2022). Previous reviews focused on antecedents' direct impact on SMEs' performance, ignoring control and moderating variables (Sadiku-Dushi et al., 2019). Madhavan et al. (2022) conducted a systematic retrospective literature review between 2015 and 2022 which highlighted the substantial impact of human-centric approaches and the adoption of digital technologies on innovation performance within SMEs and Philbin et al. (2022) reviewed literature from 2016 to 2020 on the influence of digital transformation on the sustainability of SMEs. The findings show that strategic management, organisational capabilities, and leadership help SMEs develop

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sustainably. In short, in this digital age, although scholars have reviewed a substantial body of literature on SMEs' performance and demonstrated that organisational support and environmental factors have a significant impact on SMEs' performance, there is still a lack of research on the mediating and moderating factors.

Based on the RBT, an organisation fundamentally consists of a set of specific resources. The ability of the organisation's management to combine these VRIN resources enables it to capitalise on market opportunities that contribute to employee performance (Seddon, 2014; Mwange et al., 2025). Both the RBT and DCT suggest that the combination of resources and capabilities determines an organisation's sustainable competitive advantage, with capabilities serving as the bridge between resources and performance (Rodrigues et al., 2021). In addition, previous research has demonstrated that dynamic capabilities mediate the relationship between resources and performance (Hermano & Martín-Cruz, 2016; Kurtmollaiev, 2020; Rodrigues et al., 2021; Lin& Wu, 2014). Previous empirical research has substantiated the significance of dynamic capabilities within the framework of the RBT. Utilising a sample of Taiwan's top 1000 enterprises, the findings reveal that dynamic capabilities can effectively mobilise VRIN resources to enhance employee performance. Thus, dynamic capabilities serve as a mediating variable between VRIN resources and performance outcomes (Lin &Wu, 2014). Specifically, dynamic capabilities can enhance the understanding of the actions taken by the entire organisation to achieve transformation (Abdurrahman et al., 2024). This notion is supported by Hoang et al. (2024) who suggest that dynamic capabilities positively impact the utilisation of digital transformation and can help SMEs leverage digital technologies to achieve superior performance.

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The significant role of employees in the digital market and the critical importance of their digital performance need to be given attention (Shao et al., 2022).Thus, this study introduces and incorporates the concept of EDC (Bieńkowska & Tworek, 2020) to fill the research gap by emphasising the critical role of employees as an element of dynamic capabilities in the sustainable development of digital technologies (Phan et al., 2022) as employees are valuable to organisations in the contemporary digital market (Bieńkowska & Tworek, 2020). The concept of EDC is derived from DCT. It does not only embody the characteristics of employee behaviour but also incorporates features of DCT. The primary distinction lies in the focus of the two concepts; DCT emphasises the organisation as the subject, while EDC emphasises the individual employee (Bieńkowska & Tworek, 2020; Phan et al., 2022). However, there is a gap in the literature. Although employees serve as one of the most crucial pillars in a dynamic digital market, EDC is rarely discussed as a separate research topic, they are typically considered as part of the overall dynamic capabilities of an organisation (Bieńkowska & Tworek, 2020a; Lang et al., 2023; Phan et al., 2022).

Organisational support can enhance EDC, thereby improving EDP. Similar to the DCT, EDC also exhibits characteristics of sensing, seizing, and transformation. When employees can effectively sense changes in the digital market, they can be prepared to seize opportunities or mitigate risks in advance (Phan et al., 2022; Wang et al., 2024).Seizing can be understood as the ability of employees to swiftly take action after identifying opportunities or threats, by effectively allocating and utilising resources (Rodrigues et al., 2021).Transformation, on the other hand, can be interpreted as the employees' ongoing ability to adjust and reconfigure organisational support resources to adapt to changes in the external environment following their actions (Canhoto et al.,

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2021a).Past research has shown that dynamic capabilities can serve as a mediator between resources and performance (Abbas et al., 2019; Ferreira et al., 2021; Ledesma-Chaves et al., 2020; Najmi et al., 2018).

This study tests competitive climate (CC) as the moderator. Previous studies suggest that DCT performs exceptionally well in dynamic digital environments (Sebastian et al., 2020). Environmental factors are crucial in the formulation of information system strategies as environmental changes can present both opportunities and threats (Marabelli & Galliers, 2017). CC refers to work environment in which employees strive to achieve performance goals by comparing themselves with others (Wang et al.,2018). CC can be one of key factors that can give impact to dynamic capabilities and employee performance (Wang et al., 2018). In other words, a competitive work climate promotes employee initiative and enhances their performance levels and can directly affects the survival and development of Chinese SMEs(Wang et al., 2024: Zheng, 2022). Other studies suggest that employees in East Asia tend to participate in competitions held within firms and hold the belief that competition can improve organisational productivity(King et al., 2012). Yang (2022) conducted a survey and empirical study on employees aged 18-64 in China and South Korea, with a particular focus on China, where Confucian thought has a strong influence. The results indicate that fostering a positive CC within organizations significantly enhances employees' work motivation. Regarding the impact of competitive environments on dynamic capabilities, research indicated that organisations may not need to employ dynamic capabilities if there is no competition (Samsudin & Ismail, 2019). Furthermore, the study by Wang et al. (2018) also found that creating a positive competitive environment within organizations stimulates employees' job crafting behaviours,

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thereby increasing their motivation to achieve performance goals. The primary rationale for substituting workplace environment with CC is mostly because any social science research that is isolated from the specific cultural context of a location would lessen its significance(Toney et al., 2003).Moreover, a substantial body of empirical research has demonstrated that environmental variables moderate the relationship between dynamic capabilities and performance (Nedzinskas et al., 2013; Wanget al., 2024; Wang et al., 2018; Wilden et al., 2013; Wilden & Gudergan, 2015). However, exploring the role of CC in the relationship between EDC and EDP was not explored thus it remains a gap in this research.

The aforementioned issues may hinder the rapid digital transformation of Chinese SMEs currently undergoing digital development. If these research gaps are not effectively addressed, they will not align with the Chinese government's goals of promoting digital development and the realities of advancing the digital economy. Furthermore, this study draws on the RBT and DCT (Seddon, 2014; Teece, 2018), as these theories explain phenomena by integrating strategy, resources, dynamic capabilities, and environmental dimensions to enhance EDP. However, there is currently no dedicated research from the perspective of human resource development exploring the mediating and moderating roles of EDC and CC between OSV and EDP. How to enhance SMEs' EDP represents a significant knowledge gap. Neglecting these issues could pose severe challenges to the development of the digital economy for Chinese SMEs. Therefore, this study may contribute to the successful digital transformation of China by examining these critical factors.

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1.4 Research Questions and Objectives

This research aims to investigate the impact of organisational support variables (OSV) and employee dynamic capability (EDC) on employee digital performance (EDP) in Chinese SMEs. Specifically, this study considers OSV as independent variables (digital leadership (DL), digital capability (DC), high-involvement human resource management practices (HI-HRMP), and organisational learning (OL)) with employee dynamic capability (EDC) as a mediating variable, and competitive climate (CC) as a moderating variable between EDC and EDP.

1.4.1 Research Questions

i. What are the relationship between organisation support variables (OSV) (DL, DC, HI-HRMP, and OL) and EDP in Chinese SMEs?

ii. What are the relationship between organisation support variables (OSV) (DL, DC, HI-HRMP, and OL) and EDC in Chinese SMEs?

iii. Does EDC mediate the relationship between organisation support variables (OSV) (DL, DC, HI-HRMP, and OL) and EDP in Chinese SMEs?

iv. Does EDC enhance the EDP of SMEs with CC as a moderating variable in Chinese SMEs?

1.4.2 Research Objectives

i. To examine the relationship between OSV (DL, DC, HI-HRMP, and OL) and EDP in Chinese SMEs.

ii. To examine the relationship between OSV (DL, DC, HI-HRMP, OL) and EDC in Chinese SMEs.

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iii. To examine the mediating effect of EDC in the relationship between OSV and EDP in Chinese SMEs.

iv. To examine the moderating effect of CC between EDC and EDP in Chinese SMEs.

1.5 Scope of the Study

This study aims to explore the impact of OSV (DL, DC, HI-HRMP, and OL) on EDP in the Chinese SMEs. It examines EDC as a mediating variable and CC as a moderating variable between EDC and EDP. The survey subjects were technology-based SMEs undergoing digital transformation. The respondents are employees within SMEs.

Based on the characteristics of this study, the selected SMEs must meet the following criteria: (i) having more than 20 but fewer than 1,000 employees (as defined by Jia et al., 2020) and (ii) SMEs are involved in digital operations (Li et al., 2018) (iii) SMEs located in four cities (Guizhou, Anhui, Shanghai, and Guangdong). The study used the purposive sampling technique. The survey method was determined based on the methods adopted in previous literature to ensure validity and reliability. For instance, in 2021, Scuotto et al. (2021) conducted a study on the impact of individual digital capabilities on innovation performance in SMEs, and the researchers used similar criteria when conducting a survey involving three million SMEs from European countries within the European Union.

The selection of the research scope was primarily based on the unique national conditions of China.

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Statistical data indicate that the level of digital economy development varies across different regions. The Northern Coastal Economic Zone (Shanghai) and the Eastern Coastal Economic Zone (Guangdong) exhibit higher development levels compared to the national average. In contrast, the Middle Yangtze River Economic Zone (Anhui) is at a moderate level of development, and the Southwestern Economic Zone (Guizhou) lags behind the national overall level (Li & Liu, 2021). Research findings suggest that from 2011 to 2020, the digital economy of China's provinces has shown a growth trend. The spatial distribution of the digital economy is relatively high in the eastern provinces and cities, such as Shanghai, and Guangdong, while it is relatively low in the central (Anhui), the western provinces (Guizhou), and autonomous regions. The potential for digital economic development in China's provinces remains vast (Li & Liu, 2021; Luo & Zhou, 2022; Tang et al., 2021; Wang et al., 2022). In other words, Shanghai and Guangdong represent China's economically developed regions, where digital transformation is highly advanced. These regions are the centres of innovation, technological application, and industrial development, making them ideal for studying the impact of organisational support on EDP. Their mature digital ecosystems provide a comprehensive context for exploring DL, DCs, and human resource practices (Chen et al., 2022; Luo & Zhou, 2022).

From the perspective of digital development in the surveyed regions and industries, [8] as China's economic centre, Shanghai's SMEs are primarily concentrated in manufacturing, financial services, information technology, and biopharmaceuticals. Notably, in emerging industries such as the digital economy, the Internet of Things

[8]https://new.chinasme.org.cn/html/mcms//daohang/zhongxingailan/neishejigou/zongheguihuachu/zhghbjyal/1774996608623775746.html

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(IoT), and industrial internet, the number of "specialized, refined, distinctive, and innovative" enterprises ranks among the highest in the country (China Center for Promotion of SME Development, 2024; Teng et al., 2022). Guangdong is also a major manufacturing province, with its SMEs primarily concentrated in industries such as home appliance manufacturing, electronic information, textiles and apparel, and furniture manufacturing. Notably, the home appliance manufacturing sector accounts for over 40% of the national market share, making Guangdong one of the world's largest home appliance manufacturing centres (Guangdong SME Information Network, 2024; Teng et al., 2022). [9]Guizhou's SMEs are primarily concentrated in resource-based industries, including aluminium production, phosphorus chemical processing, precision optical instruments, and electronic instrument manufacturing (Guizhou SME Information Network, 2024). SMEs in Anhui are mainly distributed across the manufacturing, technology services, and digital economy sectors. Notably, the province has a significant number of "specialized, refined, distinctive, and innovative" enterprises in the digital economy, demonstrating a competitive advantage in computer, communication, and other electronic equipment manufacturing (Anhui SME Information Network, 2024; Liu, 2025).

The reasons for regional industry disparities can be attributed to several factors: Industrial Foundation – The historical development and resource endowments of different regions lead to variations in industrial bases. For example, Guizhou's abundant mineral resources have driven its SMEs to concentrate in resource-based industries, whereas Guangdong's open policies and coastal advantages have fostered

[9] China Academy of Information and Communication Research.2024(www.caict.ac.cn); National Bureau of Statistics of China. 2024 (www.stats.gov.cn).

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the rapid growth of its manufacturing sector, particularly in home appliances and electronic information industries (Industry Observation Network, 2024; Liu, 2025).

Policy Support – The policy orientation of local governments plays a crucial role in SME development. Regions like Shanghai and Guangdong actively promote the digital economy and technological innovation by implementing supportive policies, attracting numerous SMEs to emerging industries (Teng et al., 2022).

Talent Aggregation – Economically developed regions such as Shanghai and Guangdong boast abundant talent resources and high-level educational and research institutions, providing strong support for SME development. In contrast, although Anhui produces many skilled professionals, the relative scarcity of high-quality enterprise platforms limits its talent aggregation effect compared to the former (Industry Observation Network, 2024; Liu, 2025).

Market Environment – Coastal regions like Guangdong and Shanghai have highly developed market economies and a high degree of openness, offering SMEs vast market opportunities and growth potential. Meanwhile, inland regions such as Guizhou face more limited market environments, affecting the distribution and growth rate of SMEs (Industry Observation Network, 2024; Liu, 2025).

This study focuses on technology-driven SMEs in four major regions of China, representing varying levels of economic development and digital transformation. Statistical data indicate that SMEs contribute over 50% of national tax revenue, 60% of GDP, 80% of fixed asset investment, and 70% of technological innovation in China (Industry Observation Network, 2024; Ma et al., 2023). The diversity of these four

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regions and industries enhances the study's relevance, helping to understand how organizational support influences EDP in different SME environments.

The companies were chosen from the directory of SMEs in China which was obtained through the open-source online database of SME Statistics website, Baidu, and other official websites. For instance, a search on the website revealed that Anhui Province has 759 SMEs listed in the sixth batch of entries for 2023; Shanghai has 2,532 SMEs listed in the fourth batch for 2023; Guizhou Province has 507 SMEs listed in the fifth batch for 2023; and Guangdong Province has 1,231 SMEs listed in the fourth batch for 2023. Initially, this research acquired contact information from the official websites of the SMEs listed in the database (due to the extensive list, it is not displayed here but has been stored in the cloud for immediate access: https://drive.google.com/drive/my-drive). In total, 5,029 SMEs were identified across the four regions through various channels. Based on the lists of SMEs obtained from the four regions, purposive sampling was conducted to ensure the survey met the inclusion criteria principles, thus ensuring the generalisability and applicability of the research conclusions. 15 SMEs were selected from each region (Guizhou, Anhui, Shanghai, and Guangdong). A total of 20 questionnaires were distributed to each surveyed SME in every region. For instance, during the sampling process in Anhui Province, efforts were made to select SMEs engaged in digital transformation from different cities such as Bozhou, Huangshan, Wuhu, and Fuyang to ensure wide coverage. The specific names and inventory numbers of the surveyed companies are provided in Appendix F.

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The questionnaire for this study will be uploaded to the Wen juanxing platform, generating both a survey link (https://www.wjx.cn/vm/hUHmytI.aspx#) and a QR code for respondents.

Questionnaire Distribution Strategy:

- Target Group Identification: Based on the selected survey regions, employee information will be obtained through internal enterprise administrators or relevant personnel.
- Multi-Channel Distribution: The questionnaire link and QR code will be sent to employees and administrators of the surveyed enterprises via email and WeChat. Initial communication with enterprise administrators will be conducted to gain their support, ensuring higher employee participation (Holtom et al., 2022).
- Progress Tracking: A digital tracking system will be implemented to monitor the distribution and collection of questionnaires in real time. WeChat's built-in read receipt and response tracking features will be leveraged to verify survey coverage (Christensen et al., 2022).

Strategies to Improve Response Rates:

- Automated Reminders: Unresponsive participants will receive automated reminders via WeChat messages and emails to enhance participation and completion rates.
- Pilot Testing: A pilot test will be conducted before the full-scale survey distribution to identify and resolve potential technical issues that may affect accessibility (Christensen et al., 2022).
- Technical Support: Assistance will be provided to participants experiencing difficulties in accessing or submitting the questionnaire (Holtom et al., 2022).

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- Internal Enterprise Collaboration: Collaboration with key contacts within SMEs, such as HR managers or team leaders, will be encouraged to facilitate questionnaire distribution and promote active employee participation.

In total, 1,200 questionnaires were distributed to employees working in SMEs across the four regions via online and WeChat applications. A total of 800 valid questionnaires were collected, with a response rate of approximately 66%. After reviewing and cleaning 800 valid questionnaires, 551 valid questionnaires were finally obtained.

1.6 Significance of the Study

1.6.1 Theoretical Significance

Although DCT has been extensively examined, academics have not yet been able to distinguish dynamic capacities from EDC. The concept of EDC was first introduced in 2020 as a new notion in academic research (Bieńkowska & Tworek, 2020). Similar to the DCT, EDC allows employees to integrate, establish, and reconfigure their talents to adapt to quickly changing circumstances, affecting job performance in dynamic markets. This includes the ability to identify environmental changes, respond to these changes, proactively solve problems, and engage in continuous learning (Bieńkowska et al., 2021; Bieńkowska & Tworek, 2020; Phan et al., 2022).

This study, by distinguishing between dynamic capabilities and EDC, fully acknowledges the critical role of EDC in the rapidly changing market of the digital era. The uniqueness of this research lies in its differentiation between dynamic capabilities and EDC, similar to how dynamic capabilities serve as a mediating

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variable between resources and performance (Hermano & Martín-Cruz, 2016; Kurtmollaiev, 2020; Rodrigues et al., 2021). This research positions EDC as a mediating variable between OSV and EDP, thereby expanding the applicability of dynamic capabilities and highlighting the significance of employees in the digital age (Shao et al., 2022).

The study contributes theoretically by demonstrating that in a dynamic digital market, if the internal resources of SMEs meet the criteria defined by the RBT (VRIN resources) (Ristyawan et al., 2023; Seddon, 2014;Lin,2014;), they can achieve a sustainable competitive advantage. In this study, OSV (DL, HI-HRMP, DC, and OL) have been repeatedly proven to be resources that confer a sustainable competitive advantage. The conclusions of this research provide a future development path for the successful digital transformation of contemporary SMEs, emphasising that OSV (DL, DC, OL, and HI-HRMP) enhance EDC, which in turn improves EDP, signifying the success of digital transformation. Therefore, the integration of OSV (DL, DC, OL, and HI-HRMP) with EDC constitutes an important theoretical contribution to this study.

Furthermore, the theory of dynamic capabilities posits that for an organisation to maintain a sustainable competitive advantage, it must ensure the alignment and integration of resources, strategy, capabilities, and both internal and external environments in a cohesive system (Teece, 2018).Therefore, the RBT and DCT provide strong support for the framework of this research (Barney, 2001; Lin, 2014; Teece, 2018). The RBT and DCT suggest that the organic coordination of resources, strategy, capabilities, and environment can facilitate maintaining a sustainable competitive advantage in organisations. However, since they do not clearly specify

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how these elements interact, this study will construct a clear relationship path, illustrating how strategy, resources, and capabilities with VRIN characteristics form an integrated system with the environment to promote the digital transformation of SMEs. This is the most significant theoretical contribution of this research.

1.6.2 Practical Significance

From the perspective of organisational support, this study demonstrates the direct or indirect impacts of OL, DC, and HI-HRMP on EDP. This suggests that organisations can promote the development of EDC by enhancing employee skills, empowering employees, fostering information sharing within SMEs, and recognising employees' contributions to their work (Rubel et al., 2017, 2023).

Secondly, DC represents an organisation's ability to effectively leverage digital technologies, tools, and processes to achieve strategic objectives, and employees can only enhance their dynamic capabilities and drive EDP if they effectively utilise the DC (Khin & Ho, 2019).This conclusion provides theoretical guidance to policymakers. For policymakers, the focus should be on digital infrastructure, transformation, innovation, skill development, financial support, and cybersecurity, which will create a favourable environment for enhancing DCs of SMEs and fostering their growth in the digital age.

Additionally, special emphasis is placed on the impact of SMEs building scientific training systems to enhance EDC (Kordab et al., 2020; Li & Wang, 2022; Mollah et al., 2023).This does not only directly promote EDP but also enhances employees' abilities to perceive, seize, and transform within digital markets (Wang et al.,

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2024).This indicates that providing training and improving internal DC to drive EDC has a significant value in enhancing EDP.

In the specific cultural context of China, fostering a positive CC within the organisation can increase employees' sensitivity to environmental changes, adaptability, proactive problem-solving abilities, and engagement in workplace innovation. Therefore, the conclusions of this study offer practical guidance for policymakers, for example in taking actions to optimise the business environment and enhance cultural soft power. As for SME managers, they can stimulate employees' competitive awareness by organising sales competitions and establishing effective promotion systems, which can positively impact EDP within the organisations. This study also establishes a clear relationship path by demonstrating how OSV (such as strategy and resources with VRIN characteristics) and EDC form an integrated system within the environment to enhance EDP in SMEs. This acts as a clear guidance for policymakers and human resource managers.

1.7 Definition of Key Terms

Digital Leadership (DL): DL refers to a leader who demonstrates innovative thinking at a digital level, inspires and motivates employees within a digital environment, establishes effective communication channels with employees in the digital realm, and devises digital strategies for sustainable growth (Sagbas & Erdogan, 2022; Borah et al., 2022).

Operational Definition: In this study, DL refers to the ability of SME leaders to foster innovation, inspire and motivate employees, and establish effective digital

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communication channels. It is measured by leaders' capacity to develop and implement digital strategies that enhance EDP and drive sustainable business growth in a digital environment.

Digital Capability (DC): DC pertains to an individual's proficiency in effectively utilising digital technology to accomplish objectives. It encompasses a diverse set of skills and competencies, encompassing technical aptitude, digital literacy, fluency in digital tools, and adherence to principles of digital citizenship (Khin & Ho, 2019).

Operational Definition: In this study, DC refers to an employee's ability to effectively utilize digital technology to achieve work-related objectives. It is measured by employees' technical skills, digital literacy, proficiency in digital tools, and adherence to digital best practices, contributing to their overall digital performance in SMEs.

High-Involvement Human Resource Management Practices (HI-HRMP): HI-HRMP is defined as the powerful application of human resource management practices, including capacity development, empowerment, fair rewards, information sharing, and recognition. This practice contributes to fostering employee readiness and enhancing trust among employees in the organisation's adoption of new technologies (Rubel et al., 2017).

Operational Definition: In this study, HI-HRMP refers to the strategic implementation of HRMPs aimed at enhancing employee engagement and trust in digital transformation. It is measured through initiatives related to capacity development, empowerment, fair rewards, information sharing, and recognition,

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which contribute to employees' readiness and adaptability to new technologies in SMEs.

Employee Dynamic Capability (EDC): The capacity to combine, develop, and adapt employees' skills in response to a swiftly evolving environment that directly impacts task execution within the workplace. EDC encompasses both the flexibility to adapt and solve immediate challenges, as well as the long-term enhancement of work processes within specific job roles (Bieńkowska & Tworek, 2020).

Operational Definition: In this study, EDC refers to an employee's ability to integrate, develop, and adapt their skills to meet the demands of a rapidly changing work environment. It is measured by employees' capacity to flexibly address immediate challenges, continuously enhance their work processes, and improve task execution within their specific job roles in SMEs undergoing digital transformation.

Competitive Climate (CC): CC is a setting within an organisation where employees feel obligated to evaluate their performance in comparison to others, leading to pressure and a feeling of competitiveness (Wang et al., 2018).

Operational Definition: In this study, CC refers to the organizational environment in which employees perceive the need to compare their performance against their peers, leading to pressure and a sense of competition. It is measured by employees' perceived performance expectations, competitive behaviours, and motivation to excel within SMEs undergoing digital transformation.

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Employee Digital Performance (EDP): Shao et al. (2022) classify employees' performance in the digital domain into two interconnected dimensions: digital-enabled task performance and innovative performance. Digital-enabled task performance refers to the utilisation of digital technology by employees to efficiently accomplish routine and repetitive obligations. On the other hand, digital-enabled inventive performance involves employees using digital technologies to promote innovation while carrying out their tasks.

Operational Definition: In this study, EDP refers to an employee's ability to leverage digital technologies to enhance work outcomes. It is measured through two dimensions: digital-enabled task performance, which captures employees' efficiency in using digital tools to complete routine tasks, and digital-enabled innovative performance, which reflects their ability to utilize digital technologies to drive innovation in their work processes within SMEs undergoing digital transformation.

Organisational Learning (OL): OL encompasses a range of knowledge management processes that enable the acquisition, generation, storage, sharing, and application of knowledge among individuals and groups across all levels of an organisation. Furthermore, it exerts a positive impact on sustainable organisational performance by enhancing staff competencies in efficient problem-solving and decision-making, achieving knowledge strategy objectives, and fostering effective local and global leadership (Kordab et al., 2020; Li & Wang, 2022; Mollah et al., 2023).

Operational Definition: In this study, OL refers to the processes through which SMEs acquire, generate, store, share, and apply knowledge to enhance employee

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competencies and decision-making. It is measured by the extent to which employees engage in knowledge-sharing practices, develop problem-solving skills, and contribute to achieving strategic knowledge objectives, ultimately improving EDP and sustainable organisational growth.

Resource-Based Theory (RBT): The RBT posits that for a firm to achieve a state of sustained competitive advantage, it must acquire and control resources and capabilities that are valuable, rare, inimitable, and non-substitutable (VRIN). Moreover, these VRIN resources must be absorbed and effectively applied within an organisation to realise sustained competitive advantage (Barney et al., 2011; Seddon, 2014).

Dynamic Capability Theory (DCT): The methods employed by companies to utilise resources, including integrating, reconfiguring, acquiring, and releasing resources, to adapt to or even drive market changes. Dynamic capabilities encompass the organisational and strategic practices that enable firms to allocate resources effectively as markets undergo emergence, convergence, fragmentation, evolution, and decline (Teece, 2018; Teece et al., 1997).

1.8 Chapter Summary

This chapter begins with a discussion of the background of the research. After the pandemic, both large enterprises and SMEs began to utilise digital technologies in their production and operations (Canhoto et al., 2021). The digital market is characterised by volatility, uncertainty, complexity, and ambiguity (VUCA), presenting both opportunities and significant challenges for SMEs (Troise et al., 2022). Hence, this study focuses solely on the major issues faced by Chinese SMEs during

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their digital development process—namely, strategy, resources, capabilities, and environment. Moreover, this research argues that due to their inherent resource constraints, SMEs must implement HRM strategies as they cannot rely on material and financial resources to achieve stability (Zhang et al., 2022). Therefore, the primary objective of this study is to explore whether OSV (DL, DC, OL, and HI-HRMP) as independent variables, with EDC as a mediating variable and CC as a moderating variable, can promote EDP and thereby drive successful digital transformation. The study employs purposive sampling to conduct surveys in four representative regions in China. In this research, the independent variables, dependent variables, moderating variables, and mediating variables are all constructed based on the Likert scale survey responses. The mentioned variables, identified in previous research, indicate that DL, HRMP, OL and DC are critical components in predicting employee performance, and are therefore, considered instrumental in forecasting EDP in SMEs.

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CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Based on the objectives of this study, this chapter first expounds on the characteristics of SMEs and their digital transformation. It also provides a systematic review and analysis of EDP, identifying the shortcomings in previous research. It then provides a review of the theoretical foundations and a systematic analysis that takes into considerations the DL, DC, HI-HRMP, OL, EDC, and CC.

2.2 SMEs and Digital Transformation

2.2.1 SMEs

The attributes of SMEs encompass the economic aspects, cultural, and social dimensions inherent to a particular nation (Phonthanukitithaworn et al., 2023). Their importance in contributing to the local economic development is widely recognised. Moreover, SMEs account for 90% of global business activities and 50% of employment (Melo et al., 2023). In developing nations, SMEs play a significant role in generating employment due to their ability to foster entrepreneurship via encouraging and nurturing entrepreneurial activities, enhance systemic productive capacities through labour-intensive production processes, and increase livelihood opportunities (Jakobs et al.,2024). By the end of 2022 in China, SMEs, which constituted about 99% of all enterprises, were central to the economic landscape, contributing over 50% of tax revenue, more than 60% of GDP, over 70% of technological innovations, and employing more than 80% of the urban labour force,

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thereby playing an integral role in social progress and national economic development (Peredy & Feierzhati, 2023; Yu & Liu, 2022).

In several European Union (EU) countries, including Hungary and Moldova, a simplified legal definition based on employment and turnover is utilised, while countries like the Netherlands and Spain do not have universally accepted legal and administrative definitions, similar to New Zealand (OECD, 2022). Table 2.1 shows the definition of SMEs according to the European Commission's recommendation.

Table 2.1 : The Definition of SMEs in Europe

Enterprises	Employees	Annual turnover	Annual balance sheet	Autonomous
Micro enterprise	1 to 9	<2 million euro	< 2 million euro	25% or more of the capital or voting rights of another enterprise
Small enterprise	10 to 49	<10 million euro	< 10 million euro	
Medium enterprise	50 to 249	< 50 million euro	< 43 million euro	
Large enterprise	more than 250	>50 million euro	>43 million euro	

(Source : The European Commission Recommendation OECD, 2022)

In the United States, a "small enterprise" in "agriculture, forestry, fishing, and hunting" is defined by its yearly income from all subsectors except logging. A "small enterprise" in logging employs fewer than 500 people. The annual income criteria for "small enterprises" varies among subsectors from 1 million to 30 million dollars (Vijayakumar, 2021). In Japan, the classification of SMEs is determined based on a combination of capital or total investment and workforce size. However, it is important to note that while the same criteria are utilised, the specific thresholds for each element differ across different sectors and based on different criteria. Table 2.2 shows the definition of SMEs according to Japan (Luo, 2020).

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Table 2.2： Definition of SMEs in Japan

Number of people	Capitals/investment	Industries
300	300 million yen	manufacturing, construction, and transportation
100	100 million yen	wholesale trade
100	50 million yen	services industry
50	50 million yen	retail trade.

(Source : the economic role of SMEs in the world economy, especially in Europe Luo, 2020)

Table 2.3 : Definition of SME in the UK

Enterprise style	Number of people	Turnover	Balance sheet total
Small	50	not more than £5.6 million	not more than £2.8 million
Medium	250	not more than £22.8 million	not more than £11.4 million
Large firm:	More than 250		

(Source: SBS Expert Meeting "Towards Better Structural Business and SME Statistics Luo, 2020)

The differences in defining and supporting SMEs exist between China and Western countries, with China employing industry-specific criteria that may differ from European or American definitions. Chinese SMEs tend to be relatively larger in terms of employee numbers and annual income, possibly due to lower labour costs (Prange & Zhao, 2018). Despite variations in definitions, the proportion of SMEs to total enterprises remains similar, reflecting actual economic development (Lei et al., 2022).

Table 2.4 : Definition of SME in China

Medium		Small Enterprises		Micro Enterprises	
No of employees	Operating Income (million uan)	No of employees	Operating Income (million uan)	No of employees	Operating Income (million yuan)
300<N<1000	200<X<400	20<N<300	3<X<20	N<20	X<3

Information sources: Classification Regulations for SMEs (Jia et al., 2020; National bureau of statistics, 2023)[10]

[10] National Bureau of Statistics. Available online: http://www.stats.gov.cn/tjsj/tjbz/201801/t20180103_1569357. html (accessed on 3 January 2018).

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[11] In 2023, according to the "Classification Regulations for SMEs" and the "Classification Methods for Statistical Large, Medium, Small, and Micro Enterprises" (2023), Chinese enterprises are classified based on three indicators: number of employees, operating income, and total assets. For medium-sized enterprises, the criteria are as follows: the number of employees ranges from 300 to 1000, and the operating income ranges from 200 to 400 million yuan. For small enterprises, the criteria are the number of employees ranging from 20 to 300, and the operating income must fall between 3 million and 20 million yuan (Jia et al., 2020; National bureau of statistics, 2023). In terms of defining SMEs in China, there are slight variations in the criteria used during different periods, but overall, they are similar. The scope of SMEs investigated in this study aligns with the standards outlined in the definition of Chinese SMEs.

2.2.2 Digital Transformation

Although there is no universally accepted definition of digitalisation, it is commonly used interchangeably with digitisation and digital transformation; each term representing a distinct viewpoint. Digitisation transforms analogue information into zeros and ones, so computers can store processes (Vrana & Singh, 2025). While digitalisation covers both the social and the technical aspects (Kurniawan et al., 2024), digitisation primarily refers to the technical aspects. Digitalisation is also described as how IT or digital technologies can be used to alter existing business processes (Gradillas & Thomas, 2025).

[11] https://www.stats.gov.cn/zs/tjws/tjbz/202301/t20230101_1903367.html

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The concept of digital transformation expanded in the mid-1990s with the rise of the commercial internet (Lee, 2024). “Transformation” is defined by Henriette et al. (2015) as an enterprise’s digitisation process that involves a comprehensive overhaul of its business models, organisational structures, and procedures. Digital transformation extends beyond social and technical elements as it encompasses the rapid integration of innovative digital technologies (Vărzaru & Bocean, 2024). Literatures suggest that digital transformation is the most pervasive phase that leads to the development of new business models (Vărzaru & Bocean, 2024) which affects the ways companies do business and helps increase value creation (Ding et al., 2024). Digital transformation also utilises digital technologies to enable interactions across borders with suppliers, customers, and competitors (Dubey et al., 2024).

Other works of literature state that via digital transformation, enterprises are able to establish an innovative framework for their digital business, leading to increased value generation (Khuntia et al., 2024). This happens as digital transformation enables changes in value-creation processes and the emergence of new business models and markets (Vărzaru & Bocean, 2024). Overall, digital transformation supports in attaining a competitive advantage (Boffa & Maffei, 2024).

In short, digital transformation is a company-wide phenomenon with broad organisational implications in which, most notably, the core business model of the firm is subject to change using digital technology (Merín-Rodrigáñez et al.,2024). In pursuit of digital transformation, organisations search for and implement business model innovation (Vărzaru & Bocean, 2024). Therefore, this research describes the key characteristics of digitisation and digital transformation. This research focuses on

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digital transformation, which can be described as the diverse socio-technical phenomena and processes involved in adopting and utilising these technologies within broader individual, organisational, and societal contexts (Gillani et al., 2024). The process of digitalisation or digital transformation necessitates that decision-makers establish a clear digital vision that outlines the rationale, strategy, and desired outcomes of the undertaking (Cipriano & Za, 2024). Consequently, decision-makers may encounter difficulties in the form of uncertainties, risks, and imbalances arising from the socio-technical nature of digitalisation that can potentially influence or affect various elements of organisational design and performance (Maier et al., 2022). Due to the interdependence of digitalisation strategies and other organisational elements, digitalisation alone may not comprehensively elucidate the intricate mechanisms though it impacts organisational performance (Cristache et al.,, 2024). As highlighted by Hendrawan et al. (2024), digital transformation is mostly management and not technology, and it requires managerial solutions, which may include DC and training, as well as human resources and organisational capabilities (Hendrawan et al., 2024).

Yet, digital transformation still lacks a universally agreed-upon definition, as descriptions vary regarding the degree to which it surpasses mere IT integration (Bisri et al., 2023). Digital transformation can involve integrating digital technologies into business processes, fully digitising business, and society models, or fundamentally reshaping organisational behaviour(Bisri et al., 2023), and it could also bring disruptive changes to various societal and economic aspects (Hanelt et al., 2021). It should also be noted that strategies for pursuing digital transformation encompass a broad perspective, emphasising the transformation of products, processes, and organisational aspects through new technologies (Bisri et al., 2023). Employee

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perceptions of the change introduced by workplace technology are subjective and vary individually. The effects of workplace technologies also differ across organisations. Employee perceptions of change, such as alterations in personal processes, shifts in social relationships, or changes in user experience, serve as indicators of the transformation (Colli et al., 2022). Thus, digital workplace transformation is defined as a phenomenon where new technologies bring about a significant change in all work-related aspects, including employee performance, social interactions, and the overall workplace experience (Zhang & Chen, 2024). Digital transformation relies on digital technologies, which impact companies through their key characteristics by enhancing the following core capabilities: openness, accessibility, and generativity (Muduli & Choudhury, 2024). Previous studies have shown that digital transformation has the power to significantly change companies only when employees can realise these capabilities (Cui et al., 2024).

2.2.3 Digital Transformation and SMEs

Traditional strategy planning cannot keep up with digital technology's disruptions. The disruptive nature of nonlinear technical breakthroughs is not covered by conventional planning (Omowole et al., 2024). Dynamism, ambiguity, and complexity in the business environment can drive digital business model transformation (Muduli & Choudhury, 2024). Digital technology can change customer value, making new business models more suitable for expanding markets (Gupta & Bose, 2022). Digital business models may reproduce various activities at low cost, unlike older methods (Balta et al., 2024). Digital transformation is successful if it changes new business models (Hu et al., 2024). When digital technology converges with organisational capabilities and resources, it can engender fundamental changes, particularly in how

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enterprises create and acquire value (Sun & Jung, 2024). The changes in these business models make future competition increasingly unpredictable in dynamic digital market (Ciacci & Penco, 2024). Large companies have more mature infrastructure and lower fixed production costs; on the other hand, SMEs can operate locally and explore strategic options faster (Balta et al., 2024). SMEs also exhibit strategic manoeuvrability, resilience, and flexibility, enabling them to make rapid adjustments in uncertain conditions(Sun & Jung, 2024). No company can sustain success by perpetually relying on existing business models, given the external pressures they confront. In other words, due to advancements in digital technology, traditional business models have become obsolete. Hence, there is a need to continually reshape existing business models through the utilisation of digital technologies (Hu et al., 2024).

Under normal circumstances, mature SMEs embark on the development of new business models. The objective is either diversification or replacement of an existing business model that is entering a decline phase (Hu et al., 2024). Digital transformation helps businesses in many processes involving design, manufacturing, marketing, sales and promotion, and adopting a data-driven management approach (Ghafoori et al., 2024). In SMEs, digital resource is exceedingly limited, yet they receive substantial support from high levels of social capital which help promote the application of a flexible business model (Hu et al., 2024).

It is believed that SMEs play a key role in economic growth and development by creating jobs and stimulating competition through digital transformation(Costa Melo et al., 2023). This is particularly evident as digital transformation has become the

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development strategy for many countries. For instance, OECD members have integrated SMEs into their national strategies, and the European Union has set a goal of achieving 90% digital development among SMEs by 2030 (OECD, 2022). Besides, SMEs must embark on digital transformation for several reasons. First, it is due to the modifications made by clients. Companies need to adapt to the changing needs of individuals who are becoming digital natives and accustomed to living in a digital world (Bansal et al., 2023). Second, technology is reinventing industries. Companies that fail to complete their digital transformation will be unable to keep up with industry evolution and access new growth prospects and hence, they might be eliminated (Su et al., 2023). Digital transformation is a basic skill nowadays; thus, organisations need to enhance their competitiveness (Reis & Melão, 2023). Accustomed to a digital lifestyle, businesses must now adjust to this change to meet the market's shifting demands (Laudien et al., 2024). Moreover, the advent of digital technologies has reshaped the operational and strategic landscape for SMEs (Unegbu et al., 2024).

In 2022, research conducted by the European Union revealed that 62% of SMEs encountered obstacles in digitisation. In contrast, the European Investment Bank (2022) identified that a significant 80% of large enterprises actively fostered digital advancement, underscoring a notable disparity, with fewer than 30% of SMEs actively promoting digital development(Jiang & Murmann, 2022). Lang et al. (2023) analysed four difficulties that still exist in the implementation of digital transformation in SMEs, namely insufficient investment, unclear knowledge, unclear paths, and insufficient confidence. In addition, SMEs face significant resource constraints such as workforce competitiveness, lack of technical and financial support, and low terms of data communication that hinder their digital transformation efforts and create limitations

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(Omowole et al., 2023). Besides, due to their small scale, low resilience to risks, limited business models, and poor digital capabilities, SMEs need to bear higher costs for digital transformation. The vulnerability of SMEs increases the difficulty of digital transformation (Yu & Liu, 2022).

Nevertheless, a substantial disparity exists in the adoption and effective implementation of digital strategies among SMEs, with many lagging behind larger enterprises (Díaz-Arancibia et al., 2021). This disparity is exacerbated by factors such as insufficient understanding of digital transformation, inadequate managerial skills, and lack of strategic vision concerning the digital economy (Yu & Liu, 2022; Zhang & Bu, 2024). Furthermore, 35.8% of SMEs demonstrate low awareness of digital marketing management and a relatively conservative understanding of digital transformation concepts. Data also show that SMEs are still lagging in digital transformation. According to a study by Yu and Lin (2022), 18.05% of SMEs have no understanding of digital transformation, while 26.36% have some level of understanding. This indicates that a significant portion of SMEs have yet to embrace digital transformation, with slow progress and a low level of digital technology application. In addition, currently, the lack of a unified understanding of digital transformation is one of the core issues hindering the success of digital transformation among SMEs. This is worsened by the fact that over 70% of Chinese SMEs have yet to undergo large-scale digital transformation, and the level of digital technology application is relatively low (Yu & Liu, 2022).

Data from Song et al. (2022) reveal that early-stage SMEs in China have a limited understanding of digital transformation, with only 35.35% demonstrating a slight

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understanding. SMEs in the growth stage fare slightly better with 38.53% having a slight understanding of digital transformation, which also represents the highest proportion in the corresponding level of digital transformation (Song et al., 2022). SMEs in the mature and transformation stages exhibit slightly better performance in digital transformation compared to those in the early stage and growth stage. 40.28% of mature SMEs and 36.17% of transformation-stage SMEs have begun exploring digital transformation in some aspects of their operations and achieved certain results, representing the highest proportions in their respective levels of digital transformation (Yu & Liu, 2022). However, SMEs in the transformation stage have a lower level of understanding of digital transformation compared to mature SMEs, with 22.57% of transformation-stage SMEs having no understanding of digital transformation at all. It is evident that as an enterprise development cycle progresses, the level of digital transformation will increase (Jiang & Murmann, 2022). Data indicate that the proportion of SMEs in the digital economy relative to GDP is stabilising, suggesting that the current development of the digital economy among SMEs has encountered bottlenecks. It is imperative for SMEs to accelerate their digital transformation to drive the development of the digital economy (Yu & Liu, 2022). Meanwhile, in China, SMEs face enormous market competition pressure, and the transformation of enterprises and technological innovation also encounter significant challenges (Yu & Liu, 2022). Past studies suggest that to improve the situation, the management of SMEs needs to give attention to several factors such as changing the role of the owner or manager, fostering a learning culture, establishing clear business goals or a digital transformation roadmap, creating awareness about digital technologies, and cultivating a supportive environment (Omowole et al., 2023). Additionally, collaboration with SME support organisations, innovation labs, and research

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institutions plays a crucial role. These entities aid in conducting requirements and needs analysis and implementing feasible objectives to support SMEs in the process of digital transformation(Bansal et al., 2023). Therefore, SMEs implementing digital transformation must thoroughly consider the following aspects: strategy, resources, capabilities, and both internal and external environments.

2.3 Underpinning Theories

2.3.1 Resource-Based Theory (RBT)

2.3.1.1 The Trait of the RBT

In their twenty-year "review" of the development of the RBT, Barney et al. (2011) assert that "RBT has evolved from an emerging perspective into one of the most prominent and powerful theories for understanding organisations". The RBT posits that for a firm to achieve a state of sustained competitive advantage, it must acquire and control resources and capabilities that are valuable, rare, inimitable, and non-substitutable (VRIN), and effectively apply and absorb these VRIN resources within the organisation to realise sustained competitive advantage (Barney et al., 2011; Crook et al., 2008; Seddon, 2014). In summary, the control of truly VRIN resources is the source of sustained competitive advantage (Crook et al., 2008). RBT is commonly employed to provide a holistic understanding of how resources foster competitive advantage, particularly in the context of dynamic capabilities(Barney, 2001; Teece et al., 1997). Internal organisational resources can be categorised into three types: physical capital resources, human capital resources, and organisational capital resources (Barney, 2001). In addition, the RBT can categorise organisational resources into tangible assets and intangible resources (Kamasak, 2017). Tangible resources

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refer to all assets, including digital resources while intangible resources encompass capabilities, knowledge, and organisational and strategic resources that the company possesses (Khattak & Ullah, 2021).

The RBT framework outlines four conditions to evaluate whether a resource has the potential to create and sustain a competitive advantage. These conditions are: (1) value, (2) rarity, (3) immobility, and (4) sustainability (Barney, 1991). These elements constitute the VRIS framework, which represents the essential characteristics that organisations must maintain as a foundation for strategic planning and the continuity of competitive advantage. Over time, the VRIS model (Value-Rarity-Inimitability-Sustainability) has evolved into the VRIO model (Value-Rarity-Inimitability-Organisation) (Barney et al., 2001). Terziovski (2010) utilised RBT to demonstrate that the innovation strategies of SMEs mirror those of larger firms. As a result, the accumulation of VRIN (VRIS—Valuable, Rare, Inimitable, Non-Substitutable) resources to enhance competitive advantage has become the cornerstone in both academic and managerial strategic thinking (Terziovski, 2010).

Investigating strategic information systems from the RBT perspective can provide valuable insights into how the RBT conditions (VRIN) relate to digital technology resources across different application contexts (Seddon, 2014). Furthermore, in the realm of HRM, the RBT has significantly influenced the rapidly expanding field of HRM (Kozlenkova et al.,2014; Tiwari et al., 2024). By emphasising the strategic significance of human capital for organisational success, the RBT has facilitated the convergence of Strategic human resources management (SHRM)concerns.

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Additionally, employee behaviour constitutes a critical component within SHRM that influences sustainable competitive advantage (Georgescu et al., 2024).

Specifically, resources provide the foundation for creating unique value-creating strategies and related activity systems that address specific markets and customers in distinctive ways, resulting in competitive advantages such as configurations (Barney et al., 2021), core competencies (Kabue & Kilika, 2016; Barney et al., 2021), and lean production (Manzoor et al., 2022). Resources form the core of the RBT, which refers to the tangible, human, and organisational assets, can be utilised to implement value-creation strategies (Ghosh et al., 2023). A plethora of literature substantiates that top-level leadership, human resources managers, organisational capabilities, and learning abilities as human resources are pivotal in achieving sustainable competitive advantage (Kafetzopoulos, 2022). According to the RBT, robust empirical evidence indicates that human resource strategies emphasising high-level investments in employees lead to a significant and positive correlation with higher levels of company performance through their impact on employee-based resources (Kero et al., 2023). An increasing body of strategic human resource research based on the RBT often falls short in addressing one crucial theoretical and practical question—When do employee-based resources generated within human resource strategies lead to enhanced performance? (Collins & Kehoe, 2017; Jyoti et al., 2024). Hence, to comprehend how company-level human resource strategies contribute to competitive advantage, researchers must identify key organisational factors within human resource strategies that effectively coordinate employee-based resources and determine when these factors impact the company positively (Collins, 2021). Specifically, managerial cognition, social capital, and human capital empower chief executives to identify

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external market opportunities that align with organisational resources to enable reconfiguration and deployment of these resources to achieve sustainable competitive advantage(Huy & Zot, 2019; Mehta & Ali, 2021). The dynamic managerial capabilities of top-level leaders are underpinned by three widely recognised foundational elements: managerial cognition, social capital, and human capital. These elements enable top-level leaders to effectively facilitate sustained organisational adaptation and create competitive advantages (Hossain et al., 2025). Ideally, HRMP helps create a distinctive environment that shapes and guides employees in developing and harnessing specific skills and capabilities to achieve explicit organisational objectives (Al-Kharabsheh et al., 2023). Hence, distinct human resource strategies can result in the emergence of diverse employee-based resources (Collins, 2021). Alternatively, HI-HRMP has been regarded as an effective means to leverage employee capabilities for fostering innovative behaviour(Beddow, 2021). HI-HRMP offers a set of HRMP that facilitates the development and utilisation of employees' knowledge, skills, learning, creativity, and motivation to foster innovative behaviour and contribute to organisational achievements (Beddow, 2021). The RBT recognises organisations as a collective of individuals capable of thinking outside the box, and organisations bear the responsibility for nurturing employees' innovative capabilities and creating a conducive work environment for innovation. Scholars in HRM posit that human knowledge, expertise, and employee capabilities are crucial elements for innovation success (Fonseca et al., 2019; Melián-Alzola et al., 2020). Literature on innovation also affirms that innovation creates value and sustains competitive advantage in highly complex and dynamic business environments (Kuncoro & Suriani, 2018). Scholars widely acknowledge that learning organisations foster their learning capabilities through continuous learning to improve organisational practices (Rupčić,

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2018). This encompasses action learning, which generates innovative actions, an important part of the improvement process. Both ongoing learning and substantial organisational training contribute to the innovative performance of an organisation (Do et al., 2022). Moreover, greater inter-organisational learning can empower businesses to attain more substantial and sustainable competitive advantages (Pratono et al., 2019).

Previous research in the field of information systems has also demonstrated the RBT as a foundational framework for studying IT-supported strategies, IT-enabled capabilities, and the significant impact of IT management practices on performance. It has been argued that digital strategies, DC, and HRMP related to digital technologies possess the characteristics of VRIN resources (Seddon, 2014; Kero & Bogale, 2023). Therefore, this study posits that DL, DC, HI-HRMP, and OL also embody VRIN resource characteristics. By examining the impact of OSV on EDP from the perspective of RBT, this research extends the application of RBT in the contemporary digital age.

2.3.1.2 Resource-Based theory (RBT) and SMEs

In the dynamic digital market, SMEs must possess resources that are both unique and non-substitutable to preserve a durable competitive edge (Wuen et al., 2021; Olutola et al.,2023). These resources include tangible and intangible assets, and in the current economic landscape, the pervasive use of intangible resources defines value generation and may be more valuable than tangible ones (Wales et al., 2023). Previous studies have explored the distinctions between SMEs and large corporations, highlighting the significance of SMEs in the economic sphere (Muller et al., 2021;

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Rao et al., 2023). Previous studies have also established that SMEs are the driving force behind economic growth in developed countries as SMEs make up a significant portion of firms in both the European Union and the United States (Gherghina et al., 2020). Intangible resources can contribute significantly to the development of SMEs in various realms (Khattak & Ullah, 2021; Rao et al., 2023).

Firstly, compared to large enterprises, digital technologies play a crucial role in SMEs, which have fewer tangible resources available and therefore, rely more heavily on intangible resources (Demartini & Beretta, 2020; Vrontis et al., 2022). Secondly, the notable characteristics of SMEs include strong reactivity, resilience, and robust innovation capabilities. Given these distinctive features, human capital is deemed a critical factor for the success of SMEs (Vrontis et al., 2022). To attain a competitive advantage and enhance innovative potential, SMEs need to efficiently harness knowledge and intangible assets (Khan et al., 2021). Furthermore, the cumulative growth rate of SMEs can be elucidated through the lens of intellectual capital (Phonthanukitithaworn et al., 2023). Therefore, due to their unique characteristics, SMEs should explore digitalisation not only by focusing on their tangible resources but also by focusing on their intangible resources.

2.3.1.3 Resource-Based Theory and Digital Transformation

Past research reveals that digital technology capabilities are increasingly becoming key intangible resources for performance improvement (Mikalef & Gupta, 2021). Based on the RBT, digital transformation significantly affects company performance (Akter et al., 2016). Nonetheless, given the propensity for other firms to replicate and the relatively low barriers to the acquisition and utilisation of digital technologies,

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digital technology in isolation is insufficient for SMEs to attain a sustainable competitive advantage (Jean & Kim, 2020). As highlighted by Kraus et al. (2021), digital transformation is primarily a management issue rather than a technological one. Due to the severe resource constraints faced by SMEs and considering that tangible assets have limited availability compared to intangible assets, they inherently rely more on intangible resources (VRIN) to maintain sustainable competitive advantages (Johari et al., 2021). Research indicates that effectively leveraging these intangible resources can enhance SMEs' innovation performance (Khan et al., 2021), and once a company has mastered intangible resources (human resources) and DC that are not easily replicable, it gains a competitive advantage that enhances firm performance (Chen & Lin, 2021; Yasmin et al., 2020). Moreover, the ability to effectively apply digital technology is a form of tacit resource (Bag et al., 2021). These resources include organisational support resources, labour skills, and organisational management (Chen et al., 2022). Therefore, exploring the mechanisms and key factors of digital technology's impact on firm performance holds important theoretical and practical value (Chen & Lin, 2021; Mikalef & Gupta, 2021). Additionally, past research on RBT mainly studied how organisations utilise resources with competitive advantages to acquire organisational performance (Nambisan, 2017; Saldanha et al., 2019).

The RBT explains factors that lead to the success of SMEs in utilising digital technology. While the organisational internal environment plays a crucial role in the long-term digital transformation success of SMEs (Troise et al., 2022), existing literature often overlooks the impact of external environmental conditions on SMEs' digital transformation (Ardito et al., 2021; Hadi Putra & Santoso, 2020; Nuseir &

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Aljumah, 2020). In addition, there is literature indicating that in the implementation of big data technology, some resources related to digital transformation that may not meet the RBT may have minimal impact on competitive advantage (Shan et al., 2019). In short, the ongoing debate on whether VRIN resources based on the RBT can generate a competitive advantage for SMEs and working mechanism of digital transformation remains unresolved (Seddon, 2014; Barney et al., 2021). Moreover, past research on the success factors of organisational digital transformation has mostly focused on descriptive analysis and normative discussions; hence, there is a limited number of large-sample empirical studies on the success factors of digital transformation. Also, existing research has not yet reached a consensus on the exact factors that contribute to digital transformation success. Current research primarily concentrates on large enterprises or the manufacturing industry, overlooking the unique circumstances of SMEs (Demartini & Beretta, 2020; Wu et al.,2024).

2.3.2 Dynamic Capability Theory (DCT)

2.3.2.1 Attributes of DCT

According to Dosi et al. (2000), the term “capabilities” refers to individual-level skills, whereas “routines” refers to the organisational level, and routines form the basis for capability building. Helfat and Peteraf (2003) define organisational capabilities as the ability of an organisation to perform a set of coordinated tasks by utilising organisational resources to achieve specific end results. In this definition, capabilities differ from routines as the purpose is to achieve specific end results. Not all capabilities are equal, and the capabilities of different organisations may vary. With regard to DCT, the concept of dynamic capability was initially introduced by a

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research group led by Teece et al. (1997) who sought to elucidate the role of strategic management in dynamic capabilities, referring to it as a subset of capabilities that enables firms to create new products and processes and respond to the ever-changing market environment. However, Eisenhardt and Martin (2000) contend that Teece's conceptualisation of dynamic capabilities lacks clarity and may not sustain competitive advantage in a rapidly changing environment (Eisenhardt & Martin, 2000). Therefore, Eisenhardt and Martin (2000) redefined DCT as the organisational process of using resources to match or even create market changes. Thus, DCT is the organisational and strategic routines that facilitate the reconfiguration of resources when markets emerge, collide, split, evolve, and decline, explaining how DCT thrives and attains sustainability (Eisenhardt & Martin, 2000). In summary, DCT influences the sustainable competitive capability of organisations (Sandberg & Åman, 2010).

Moreover, different scholars offer varying interpretations of DCT. DCT is considered a learnt, stable pattern of collective activities. Organisations systematically generate and modify their operational routines through this pattern to pursue increased efficiency (Barney, 2001). DCT involves capabilities used for extending, modifying, or creating ordinary functions (Winter, 2003), appropriately reconfiguring company resources and routine capabilities (Zahra et al., 2006), ability to rapidly and adeptly perceive and seize opportunities (Teece, 2007), and behaviours directed towards building dynamic capabilities which involve upgrading and reconfiguring core capabilities (Wang & Ahmed, 2007). DCTs can recognise and shape possibilities and threats, capture opportunities, and maintain competitiveness by upgrading, integrating, safeguarding, and reorganising firms' tangible and intangible assets (Teece, 2007, 2018). DCT also explains how firms can use internal resources and competencies to

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gain a sustained competitive edge in a changing business environment (Akenroye et al., 2020) as DCT focuses on strategic change in organisations by enhancing the effectiveness of coordination and improvement processes and resource allocation (Helfat & Peteraf, 2015). Dynamic capabilities also have a substantial impact on competitive advantage by influencing VRIN resources (Tejumade V. Adeniran, 2012). Therefore, organisations should effectively cultivate dynamic capabilities to respond to changes in the business environment. DCT, as an extension of the RBT, enables organisations to attain sustainable competitive advantages by continually adjusting or renewing their resource base (Pulsiri & Vatananan-Thesenvitz, 2018).

Furthermore, in moderately dynamic markets, dynamic capabilities are manifested through routines that are built upon existing knowledge. These routines involve analysis and implementation using established knowledge and heuristics. Due to the codified nature of existing knowledge, these routines tend to be detailed and specific, leading to predictable outcomes (Helfat & Peteraf, 2015). Therefore, in moderately dynamic markets, dynamic capabilities conform to classic research, where efficient and resilient routines work (Zhang et al., 2023). However, dynamic capabilities differ in high-speed markets, which are simple, empirical, and iterative (non-linear) (Tejumade V. Adeniran, 2012). DCT relies on the creation of situation-specific knowledge that applies to simple boundaries and priority-setting rules. Beyond the RBT, their competitive advantage lies in their ability to change the resource base by creating, integrating, reconfiguring, and releasing resources (Eisenhardt & Martin, 2000).

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However, the RBT collapses in high-speed markets, where the strategic challenge is to maintain competitive advantage and the duration of competitive advantage is inherently unpredictable (Eisenhardt & Martin, 2000; Teece, 2015). Therefore, sustainable competitive advantage resides in the resource configuration built by managers using dynamic capabilities, rather than the capabilities themselves (Teece, 2018). Past literature also suggests that effective dynamic capability is a necessary condition for competitive advantage, but not a sufficient one, so it is useful to enhance existing resource configurations in the pursuit of long-term competitive advantage (the leverage logic of RBT) (Eisenhardt & Martin, 2000; Liu et al., 2018). The dynamic capabilities approach reinforces this protection in explaining business models (Teece, 2007). While business models can be easily imitated by competitors, and VRIN protection may be weakened, the dynamic capabilities approach strengthens this safeguard (Teece, 2018).

Table 2.5 explains the differences between a moderate market and a high-speed market in terms of market definition, pattern, execution, stability, and outcomes. The main difference is that a moderate dynamic market is characterised by linear predictability, while a high-velocity market is irregular and unpredictable (Eisenhardt & Martin, 2000).

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Table 2.5 : Moderately Dynamic Markets vs. High-Velocity Markets

	Moderately dynamic markets	High-velocity markets
Market definition	Stable industry structure, defined boundaries, clear business models, identifiable players, linear and predictable change	Ambiguous industry structure, blurred boundaries, fluid business models, ambiguous and shifting players, nonlinear and unpredictable change
Pattern	Detailed, analytic routines that rely extensively on existing knowledge	Simple, experiential routines that rely on newly created knowledge specific to the situation
Execution	Linear	Iterative
Stability	Yes	No
Outcomes	Predictable	Unpredictable
Key to effective evolution	Frequent, nearby variation	Carefully managed selection

(Source: Dynamic capabilities: what are they? Eisenhardt & Martin, 2000)

2.3.3 Sustainable Competitive Advantage

The utilisation of significant information technology (IT) resources and capabilities typically aids in enhancing competitive advantage and performance (Hossain et al., 2022). Additionally, resources and capabilities can serve as sources of competitive advantage (Fabrizio et al., 2022). Resources encompass tangible and intangible assets, and in the current economic landscape, the pervasive use of intangible resources is a defining feature of value generation in such situations. In comparison to tangible assets, intangible resources may have inherent greater worth (Wales et al., 2023); thus, entrepreneurs can benefit organisations by leveraging intangible resources (talent capital) related to SMEs(Wang et al., 2024). Furthermore, SMEs exhibit strategic manoeuvrability, resilience, and flexibility, enabling them to make rapid adjustments in uncertain conditions (Shore et al., 2024). Therefore, SMEs employing different business models will be able to find specialised solutions. By doing so, SMEs can also benefit by identifying performance areas most positively influenced by using intangible resources (Demartini & Beretta, 2020). Bamhdi (2024) acknowledges that

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intangible assets are non-monetary resources that lack any physical form. Kamasak (2017), on the other hand, asserts that intangible resources are not easily acquired in the market and cannot be readily replicated by competitors. Therefore, the success factors of SMEs can also be viewed as their intangible resources, which possess scarcity, non-substitutability, and are difficult to imitate. Nonetheless, a gap persists in both theoretical and empirical research concerning how SMEs can effectively leverage tangible and intangible resources to drive EDP.

The RBT does not provide detailed explanations on why and how some enterprises gain a competitive advantage in unpredictable and rapidly changing environments (Ristyawan et al., 2023). Hence, dynamic capabilities serve as a crucial intermediary between resources and performance (Lin & Wu, 2014; Baía & Ferreira, 2024). Capabilities are crucial attributes required for firm operations (Baía & Ferreira, 2024).These functionalities assist in deploying other necessary resources to enhance company performance (Yao et al., 2021). Meanwhile, digital transformation can also enhance enterprise capabilities and improve firm performance (Chatterjee et al., 2021). The RBT is often used to demonstrate the correlation between company resources, capabilities, and performance (Hossain et al., 2021); however, in the rapidly changing digital market, firms must strive to form enduring dynamic capabilities to adapt to environmental changes and gain competitive advantage (Saputra et al., 2024). Some researchers argue that dynamic capabilities do not automatically lead to performance improvement and that firms must rely on the RBT to gain competitive advantage in digital market(Saeedikiya et al., 2024).

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In addition, the combination of individual resources alone is insufficient to adequately account for the long-lasting effect of competitive advantage. The theory posits that dynamic capabilities are the result of organisations accumulating critical skills and tacit knowledge over a period of time (Cordeiro et al., 2023). Dynamic capabilities are intellectual capital that competitors struggle to copy. To compete, companies must establish unique core competency systems based on their own resources, increase their core capabilities, and acquire and use internal organisational resources and learning capacity. Additionally, these capabilities mostly include intangible and tangible assets (Mendoza et al., 2023). However, in the field of digital technology, the impact of resources and dynamic capabilities on value creation and the formation path of competitive advantage have not received sufficient attention (Fabrizio et al., 2022).

Based on the RBT and DCT, the mechanism for obtaining competitive advantage is a topic worthy of further discussion (Fabrizio et al., 2022). Therefore, this study aims to draw upon the approaches of the RBT and DCT to analyse how SMEs in digital transformation impact competitive advantage. Empirical studies show that in a digital era, characterised by social progress, the advent of new technologies, and a complex market environment, digital resources and strategic resources have become crucial factors for companies to achieve a competitive edge (Fabrizio et al., 2022). Moreover, the proficient usage of information technology, organisational structure, and managerial resources and talents can assist companies in improving their innovation and performance (Sutrisno et al., 2023). DCT is proposed to orchestrate these resources to achieve sustained competitive advantage (Baía & Ferreira, 2024). However, past research have shown that resources indirectly influence competitive

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advantage through dynamic capabilities, yet the model has not discussed whether firm size or industry type similarly affects competitive advantage (Sutrisno et al., 2023).

According to Barney (1991), most important resources are valuable, rare, inimitable, and non-substitutable (VRIN). VRIN resources can maintain competitiveness, and because most intangible assets are unclearly owned, they are hard to get and hard to negotiate (Teece, 2015). Moreover, VRIN resources constitute a crucial component of any competitive advantage theory. The most significant category among VRIN assets is intangible assets, also referred to as intellectual capital (Teece, 2000). Another major component of the dynamic capability framework is strategy. Capabilities are primarily about what to produce, how to produce it, and where to manufacture, market, and distribute it, while strategy helps determine when to enter the market and how to deter competitors. The goal of the strategy is to outmanoeuvre competitors by capitalising on their mistakes and leveraging internal strengths (Teece, 2018).

DCT indicate that the three core elements of dynamic capability framework i.e. capabilities, resources, and strategy form an interdependent system that collectively determines an organisation's competitiveness. Furthermore, when strategy, resources, and capabilities are robust and interact harmoniously, and are aligned with both internal and external environments, competitive advantage is enhanced (Teece, 2018). Therefore, organisations are visualised as a set of tangible and intangible resources, where core capabilities must be developed internally, while other capabilities can be acquired externally (Teece, 2015).This study is rooted in China's specific cultural environment, considering CC as an internal environmental variable in SMEs to bridge

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this theoretical gap and further demonstrate the effectiveness of Teece's (2018) proposed dynamic capability system.

Past empirical research also shows that informal strategies and a flat, flexible structure are often the characteristics of SMEs, where substantial investments are made in human capital (Sekhar et al., 2015). Strategy and human capital are intricately linked, as strategy represents the objectives of a company, and human capital can contribute to the achievement of these established goals (Boon et al., 2018). Top-level management capabilities and HRM are invaluable intangible resources for SMEs (Kafetzopoulos, 2022). Their scarcity, imprecise imitability, and substitutability can determine their innovation and sustainable competitive advantage potential (Khan et al., 2021). This is because when a company's leaders implement value-creation strategies and management practices that other companies cannot replicate, the company can be said to possess a sustained competitive advantage (Badawi et al., 2024). Furthermore, human capital is a crucial driver of growth for startups (Adomako et al., 2022), and almost all aspects of resource management and innovation implementation in companies rely on HRM and human capital (Gerhart & Feng, 2021; Badawi et al., 2024). Moreover, employees' specialised knowledge represents an intangible resource for cultivating distinctive capabilities, and distinctive capabilities are the organisational competencies that confer a differentiation from competitors (Sutrisno et al., 2023).

Past research has theoretically and empirically demonstrated the importance of resources, capabilities, and strategy in achieving internal competitive advantage within organisations (Teece, 2018). However, both theory and empirical evidence

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remain ambiguous on how to effectively utilise resources, capabilities, and strategy, and how to maintain sustainable competitive advantage in organisations by aligning resources, capabilities, and strategy with the external environment within the dynamic capability framework (Barney, 2001; Teece, 2018). In addition, the systematic literature review conducted shows that there is still limited research on how capabilities influence management success and how improving capabilities can enhance performance inputs (Emiliano De Souza et al., 2022). While emphasising that dynamic capabilities must rely on VRIN resources to achieve long-term competitive advantage, it remains unclear for various organisations which tangible and intangible resources possess the conditions defined by VRIN resources. Therefore, this study will be grounded in the RBT and DCT, focusing on Chinese SMEs to explore how to leverage VRIN resources, strategy, and dynamic capabilities within the specific cultural environment of China to drive successful digital transformation.

In summary, the RBT emphasizes that firms achieve competitive advantage by leveraging resource of VRIN characteristics. In this study, OSV—DL, DC, HI-HRMPs, and OL—are identified as key resources that SMEs utilize to enhance EDP, aligning with the VRIN characteristics (Li et al., 2022; Mathur, 2015; Borah et al., 2022; Zhang et al., 2023). DL provides vision and direction for digital transformation (Sagbas & Erdogan, 2022; Borah et al., 2022), while DCs equip employees with the necessary tools and infrastructure to effectively utilize digital technologies (Khin & Ho, 2019). HI-HRMPs enhance employee engagement and foster digital skill development (Rubel et al., 2023), whereas OL facilitates knowledge sharing and continuous adaptation (Mollah et al., 2023). However, although RBT explains which resources are essential, it does not fully address how firms can continuously adapt

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these resources to an evolving digital environment. This gap underscores the necessity of integrating the DCT into this study.

The DCT extends the RBT by explaining how organizations develop, integrate, and reconfigure resources to address the challenges of digital transformation (Seddon, 2014; Teece, 2018). This study highlights that EDCs serve as the critical mechanism linking OSV to EDP.

- Sensing: Employees identify and anticipate digital trends and opportunities (Phan et al., 2022).
- Seizing: Employees apply digital knowledge to enhance work performance and innovation capabilities (Rodrigues et al., 2021).
- Transforming: Employees adapt and refine their digital skills to maintain long-term competitiveness (Canhoto et al., 2021).

As previous theories suggest that dynamic capabilities mediate the relationship between VRIN-characterized resources and performance, this confirms that dynamic capabilities are essential for transforming organizational resources into tangible performance outcomes.

The RBT posits that organizational support constitutes a valuable resource (Seddon, 2014), whereas the DCT explains how employees develop dynamic capabilities to effectively leverage these resources (Teece, 2018). While RBT focuses on the possession of digital capabilities, DCT emphasizes continuous adaptation and reconfiguration (Li & Wu, 2014). Moreover, the CC, as a moderating variable, can be regarded as an external force that compels firms to develop dynamic capabilities,

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thereby reinforcing the necessity of both theoretical perspectives (Wang et al., 2018; 2024).

Therefore, this study integrates RBT (resources with VRIN characteristics) and DCT (EDC as a transformation mechanism) to explain how SMEs enhance EDP during digital transformation. RBT establishes the foundation, while DCT ensures adaptability—both theories complement each other and are essential for understanding EDP in SMEs.

2.4 Employee Digital Performance (EDP)

2.4.1 Conception of Employee Performance

Employee performance is a fundamental concept in business, encompassing a structured framework with multiple components. It is defined as the behavioural aspect that leads to tangible outcomes or whether employees excel in their jobs (Alromaihi et al., 2017). Employee performance, as a component of organisational effectiveness, has recently become a more frequently studied topic in academic research. The emergence of new management processes post-digitisation has intrigued companies regarding this concept. It is particularly crucial as it is one of the methods to enhance organisational efficiency, productivity, and commitment (Çini et al., 2023). Employee performance is also expressed as the quality and quantity of employees achieving goals and objectives, as well as the responsibilities they assume (Hermina & Yosepha, 2019) as performance is the result of the work and work-related behaviours accomplished within a specified period to fulfil assigned tasks and responsibilities. The dimensions of employee performance evaluation encompass quality, quantity, timeliness, cost, supervision, and interpersonal relationships among

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employees (Muniroh et al., 2022). Employee performance is also defined as all the efforts enterprise employees require within the scope of their remuneration (Agus Triansyah et al., 2023). Another study refers to it as the situation in which selected individuals complete tasks, measured by the supervisors or the organisation against pre-defined acceptable standards (Jena, 2015). Therefore, understanding job performance is crucial for every employee as organisational decisions are based on individual performance, contributing to the overall success of organisations (Iskamto, 2020). At this juncture, the measurement of performance should be meaningful and adhere to the principle that what cannot be measured cannot be managed (Iskamto, 2020). In other words, employee performance pertains to what actions or inactions employees engage in (Hasibuan et al., 2024).

Many organisations focus on being more efficient and profitable in this industrial revolution 4.0 or digital era (Lim, 2023), and well-performing employees would indeed, benefit organisations. If team members have pleasant feelings, strong ties, and positive motivation, they will perform better and help the firm (Ansori, 2021).Digitisation has become an indispensable part of every organisation, contributing to both individual and organisational performance (Alsufyani & Gill, 2022). Organisations depend on technology and digital tools to run efficiently in the digital age, so EDP must be assessed to ensure employees have the skills and abilities to use these tools (Haris & Usman, 2023). EDP has been the focus of addresses on how digital technologies affect companies' sustainable development (Fu et al., 2023; Shao et al., 2022).

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Another study divided employee performance into routine and innovative performance. Innovative performance involves exceeding expectations and generating and using new ideas and problem-solving techniques to achieve positive results(Ali-Hassan et al., 2015). However, routine performance involves constant and reliable work completion and core responsibility fulfilment (Ali-Hassan et al., 2015; Zhang et al., 2022). Another subset of scholars characterises employee performance as the extent, both qualitatively and quantitatively, to which employees achieve goals and objectives, along with the responsibilities they undertake (Diamantidis & Chatzoglou, 2019).

As digital technology use has become an integral part of job performance for the digital workforce, employee performance is transformed into EDP (Shao et al., 2022). This is because employees' efficient use of digital technologies to achieve digital performance is a key component of successful digital transformation (Nambisan, 2017; Saldanha et al.,2019). Aligned with this perspective, Shao et al. (2022) define EDP in accordance with existing research on employee performance (Ali-Hassan et al., 2015; Kuegler et al., 2015). They divide EDP into digitally driven task performance and digital innovation performance. Digitally driven task performance involves employees using digital technologies to efficiently complete routine and repetitive tasks, while digital innovation performance involves using digital technologies to drive innovation and achieve innovative results (Shao et al., 2022; Zhang et al., 2022). Digital technology has become a basic part of job performance for the digital workforce, transforming job performance into EDP (Ali-Hassan et al., 2015; Shao et al., 2022). Researchers share a consistent definition in their studies (Shao et al., 2022; Zhang et al., 2022) i.e. the attainment of EDP through the utilisation of digital technology

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signifies success in digital transformation(Shwedeh et al., 2023). However, there remains a gap in the current academic research regarding achieving EDP effectively.

2.4.2 Evaluation Criteria for EDP

Digital technology has swept the business world over the past decade, transforming organisational administration and creativity (Marion & Fixson, 2021).Digital transformation changes organisational strategy, business processes, knowledge, and socio-technical structure(Park & Saraf, 2020). However, there is a common misconception that digital transformation occurs only when businesses upgrade and adapt to new technologies. In fact, in reality, digital transformation is not solely about software or technology; it is about an organisation's adaptability and responsiveness to the digital environment and change (Verhoef et al., 2021). Considering the transformations in organisational dynamics and external environments induced by digital technology, it is critical to comprehend the elements that support or impede digital strategic initiatives (Hanelt et al., 2021). Furthermore, the outcomes of digital transformation are frequently dependent on the abilities, expertise, and attitudes of the workforce (Engelsberger et al., 2023). Hence, discussions on how digital solutions affect the transformative journey towards sustainable business development have always focused on employee performance (Turyadi et al., 2023). Another group of scholars defines employee performance as the quality and quantity with which employees achieve goals and objectives, along with the responsibilities they undertake (Campbell et al., 2020), while Ren and Sun (2023) define in-role job performance as reflecting on completion of tasks within an individual's scope of responsibilities, as well as individual learning performance (Arashpour et al., 2023). While their classification of EDP into routine and innovation dimensions has advanced the

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understanding of digital performance (Shao et al., 2022; Zhang et al.,2022), a systematic database search found only two articles that mention these definitions, and neither has systematically constructed an evaluation framework.

Without a well-developed evaluation system, the measurement of EDP would be unfairly compromised (Wang et al.,2024). Therefore, establishing an objective and equitable assessment framework for EDP is of paramount importance (Wang et al.,2024). The Results and Determinants (RD) framework and the Adaptive Enterprise Architecture (EA) framework were used to construct an evaluation system for EDP (Alsufyani & Gill, 2022). A systematic literature review using relevant keywords on Google Scholar, Web of Science, and Scopus yielded a total of 32 relevant articles that highlight emphasising, innovation efficiency (52%), employee attitude (25%), and job flexibility (10%) in measuring organisational indicators of EDP. However, academic attention to evaluating employee performance in terms of job stability, productivity, job autonomy, profitability, and sales growth, has not received sufficient attention in the academic community (Wang et al., 2024).

In 2022, scholars constructed an evaluation system for organisational performance (Alsufyani & Gill, 2022), revealing three gradients in assessing organisational performance. The first gradient primarily focuses on profit, market share, return on assets, revenue, sales growth, and innovation effectiveness. The second gradient emphasises efficiency ratios, ratios, business market indicators, operational performance, return on investment, and turnover. The third gradient particularly centres on employee performance (Alsufyani & Gill, 2022). It seems that there is a significant difference in measuring organisational performance and employee

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performance in the digital age. This further substantiates the substantial distinction between organisational digital performance and EDP (Alsufyani & Gill, 2022; Shao et al., 2022; Zhang et al., 2022). To sum up, through the review, it was found that job flexibility, innovation abilities, and attitudes are the current focal points of organisations (Wang et al.,2024). Hence, this study utilises a scale constructed by scholars such as Shao et al. (2022) to assess EDP, which shows similar consistency with employee performance and EDP.

2.4.3 Factors Affecting Employee Performance

The success of an organisation is heavily contingent upon EDP (Shao et al., 2022; Zhang et al., 2022). To attain optimal performance, a company must possess the capability to create conducive conditions that foster and enable employees to cultivate and enhance their skills, elevating them to peak proficiency in their digital capabilities (Iskamto, 2020). Employee performance and the firm's goal and mission will be achieved if employees adhere to the systems set by the company. One strategy to achieve organisational goals is for employees to obey leadership's policies (Ibrahim et al., 2022). Effective leadership is crucial for addressing HR management challenges. Employees often follow their leaders' policies, making sound decision-making essential for organisational success. Poor policies can negatively impact the entire organisation (Iskamto, 2020). Moreover, the human resources literature consistently highlights the importance of employees as the most valuable asset of human capital (Kafetzopoulos, 2022).

In terms of factors affecting job performance, past research has shown that due to the independence, flexibility, debate and open communication with management and

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partners, and technology usage of millennial employees, companies face various challenges in terms of industry loyalty and commitment (Troise et al., 2022). Companies must now examine, modify, and adjust their management and leadership strategies to adapt to the significance of their employees, treating them according to standards that have been established for millennia, underscoring the critical role of leadership (Putriastuti & Stasi, 2019; Turyadi et al., 2023). Additionally, HI-HRMP plays an important role in supporting the process of digital transformation and motivating employees to use digital technologies in a standardised or innovative manner. Leaders at different levels play significant roles in organisational management (Tepper et al., 2018; Rubel et al.,2023), in the technology adoption process of SMEs (Chatterjee, Chaudhuri, et al., 2021), and in the digital technology usage contexts (Nambisan, 2017).

When companies face challenges brought about by digital technologies, human capital plays a crucial role in determining success (Kurniasih et al., 2022). Employees, with their knowledge to design and implement new approaches, are essential in leveraging emerging technologies to create value (Lepore et al., 2023). In particular, the effective use of digital technologies by employees to achieve job performance(EDP) has been recognised as one of the most critical factors for the success of digital transformation (Nambisan, 2017; Saldanha et al.,2019). Employees leveraging digital technologies can achieve innovative performance for organisations (Arias-Pérez & Vélez-Jaramillo, 2022). Recent studies also indicate that organisations implementing digitally oriented strategies can significantly improve digital innovation performance (Arias-Pérez & Vélez-Jaramillo, 2022; Liu et al., 2023). Employee behaviours such as honesty, integrity, professionalism, self-confidence, and self-discipline are also crucial for

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improving employee performance in the digital era (Rosmi & Syamsir, 2021). The development of digital technology has significantly forced companies to optimise their management processes and develop a pathway for achieving job performance (Parker & Grote, 2022). The main pathway in achieving employee performance in an organisation is greatly influenced by its current resource endowments and its dynamic capabilities in dynamic markets (Seddon, 2014). Moreover, from the perspective of strategic choice, researchers claim that the subjective initiative of decision-makers and top management is crucial for ensuring dynamic capabilities (Heubeck, 2023).

Previous studies have indeed demonstrated factors influencing employee performance, yet there has not been any systematic investigation on how organisations utilise digital technology in the digital era to impact EDP. Thus, it is imperative to conduct a systematic review of factors influencing EDP. A keyword search across three databases (Google Scholar, Web of Science, and Scopus) yielded a total of 31 articles about the impact of digital transformation on employee performance. Of these, 22 articles were quantitative studies, 7 were qualitative studies, and 2 employed a mixed-methods approach.

Subsequently, 15 studies (51.7%) demonstrated the significant impact of technology use on employee performance. Among them, two quantitative studies investigated the influence of leadership types and top management support on employee performance, while 2 mixed-methods studies expounded on the impact of DL, DCs, and employee attitude on employee performance (Benitez et al., 2022; Çini et al., 2023). One quantitative study explored the influence of organisational training on employee performance. Only two articles focused on SMEs (Wang et al., 2024). Concerning

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mediating variables, employee attitude variables include technostress (mentioned in two articles), high-activated positive emotions, psychological empowerment, self-esteem, stress perception, reputation maintenance concerns, and digital self-efficacy. Employee behavioural variables encompass knowledge sharing, knowledge donating, knowledge collecting, innovative work behaviour, work-life balance, and employee motivation. Two articles referenced technology variables as mediating factors (Wang et al., 2024).

Clearly, there are research gaps in the study of employee performance. Firstly, despite the significant impact of DL, DC, OL, and HRMP on organisations, there is limited exploration of their effects on EDP. There is an especially notable scarcity of research conducted in SMEs (Shao et a.,2022; Wang et al., 2024). Secondly, concerning mediating variables, employee attitudes and behavioural variables are crucial for achieving employee performance (Wang et al.,2024). However, despite the paramount importance of EDC in rapidly changing markets, it is seldom treated as a mediating variable in research (Bieńkowska & Tworek, 2020). Also, previous literature has discussed the pivotal roles of top-level leadership, HRM, digital capabilities, organisational training, and dynamic capabilities within organisations. However, there is a scarcity of systematic exploration in the literature regarding the impact of these factors on EDP in SMEs (Wang et al., 2024).

Furthermore, empirical literature shows that digital dynamic capabilities play a mediating role in integrating digital technology adoption and digital performance (Mikalef et al., 2019). Through the analysis of variables influencing employee performance, the current research on EDP in the digital age has overlooked the critical

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role of EDC although scholars frequently mentioned that EDC has a greater impact on employee performance compared to attitudinal and behavioural variables in dynamic markets (Bieńkowska et al., 2021a; Bieńkowska & Tworek, 2020; Phan et al., 2022; Tworek et al., 2023). Therefore, this study develops a resource-capabilities-performance framework based on DCT. Using data from SMEs, this study examines the mechanisms of the impact of organisational support factors and EDC on EDP.

2.4.4 Factors Affecting Employee Performance in SMEs

Over the past two decades, there has been a gradual increase in academic interest regarding the contexts surrounding SMEs (Morais & Ferreira, 2020). However, the core factors contributing to the sustainable development of SMEs have largely remained unexplored (Silva et al., 2021). To gain a deeper understanding of the driving forces behind the development of SMEs, researchers have explored various factors influencing employee performance. These factors encompass OL, managerial activities, innovation culture, social development, and other contributing elements (Asemokha et al., 2019). An effective HRMP is also a crucial variable for SMEs. Only with proactive and engaged employees can organisations achieve high performance (Ma et al., 2023; Vuong et al., 2020; Zhou & Zheng, 2024) as employees are valuable assets in SMEs (Simbolon et al., 2022). Studies have also pointed out that although SMEs are oriented towards success, their management approaches still need to evolve to pay more attention to the scarcity of resources (Zhang et al.,2022). Moreover, dynamic capabilities related to resources and human capital are considered particularly important (Rodrigues et al., 2021).

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Furthermore, the impact of different antecedents on employee performance appears to be context-dependent, as the empirical results vary widely across studies (Kafetzopoulos, 2022b). The existence of moderating factors in the link between antecedents and SME performance is supported by findings from empirical studies (Fainshmidt et al., 2016). Organisation theory places a strong emphasis on the work environment, which is one of its main characteristics. Environmental factors can have a beneficial or detrimental impact on a company's performance (Samsami et al., 2015). Given the increasing evidence of SMEs engaging in international markets, the academic community must prioritise research on SMEs. However, existing literature lacks a comprehensive summary of the antecedents of SME performance (Eller et al., 2020). Understanding the various factors influencing employee performance comprehensively is essential for effective management within SMEs (Yang, 2023). Therefore, there is a need to expand and refine a set of explanatory variables to gain a deeper understanding of the seemingly unpredictable nature of growth in SMEs in a flexible and turbulent environment (Dwikat et al., 2023). As a result, there is a need to synthesise existing knowledge on the antecedents of SMEs' EDP to support theory development and provide reliable recommendations for management practices (Wang et al., 2024). SMEs may encounter obstacles in their digitisation endeavours, stemming either from inadequate financial resources or a scarcity of essential assets. Alternatively, they may face internal challenges such as knowledge disparities and a deficiency in technical skills (Su et al., 2023). Key challenges in SME's digitalisation process are related to the lack of a clear strategic vision among entrepreneurs and the lack of expertise in project management which hinder the profitability of SMEs. In today's fierce competition landscape, particularly among internal workers, leveraging employees' knowledge, skills, and adaptability to improve human resources and

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providing continuous support will motivate employees to contribute to the company (Ajayi & Udeh, 2024). The company's structure should also be refined based on employees' capabilities to enhance overall performance (Andersén, 2021). Meanwhile, the tremendous development in digital technology is propelling the recent economic boom and significantly impacting organisational management. Since the aftermath of the global COVID-19 pandemic, many organisations have started seeking technology-based management systems to achieve sustainable performance (Peng, 2022). According to the human capital theory, if organisations provide effective support, employees can use their knowledge, skills, and abilities to help organisations to gain a competitive advantage (Nguyen et al., 2021). Moreover, in dynamic and ever-changing markets, a variable that cannot be overlooked is dynamic capability as organisations can only achieve sustained competitive advantage in dynamic markets by possessing dynamic capabilities (Bari et al., 2022; Teece & Linden, 2017). Past evidence has also repeatedly demonstrated dynamic capability as a mediating variable between organisational support factors and performance (Scheuer & Thaler, 2022; Lin & Wu, 2014; Hermano & Martín-Cruz, 2016).

In summary, it is evident that there is a lack of well-established standards for measuring EDP (Wang et al., 2024). Although there is no consensus in the academic community regarding the evaluation criteria for EDP, it is certain that EDP primarily revolves around employees' ability to utilise digital technology to complete routine tasks, their innovation capabilities, and their dynamic capabilities, which have garnered widespread attention from scholars (Shao et al., 2022). Furthermore, currently, there is no effective framework in place for achieving EDP. In addition,

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research findings across different industries vary significantly. Therefore, this study seeks to establish an empirical analysis framework for assessing EDP.

2.5 Digital Leadership (DL)

2.5.1 The Attributes of Digital Leadership

A report by the European Union in 2015 indicates the need for 40,000 to 50,000 digital leaders annually (Sow & Aborbie, 2018). The majority of identified publications were published in 2016, indicating an increasing popularity of the term "DL" in academic literature (Kokot et al., 2021). Digital leaders are imaginative and considered catalysts for change, capable of unifying organisational thoughts and goals, connecting the company through partnerships, and creating new opportunities (Öngel et al., 2024). Digital leaders implement digital companies using governance, vision, values, structure, culture, and decision-making, which require individual adjustments to staff management, virtual teams, knowledge, communication, and collaboration (Eberl & Drews, 2021). The digitisation of businesses propels the digitalisation of leaders, leading to the emergence of DL, which necessitates leaders to strategically plan and execute systemic activities, empower employees to achieve digital goals, balance technological and human factors, adapt to changes, and leverage disruptive technologies to enhance productivity, create value, and contribute to societal welfare (Ebert & Duarte, 2018). DL is a combination of culture and capabilities aimed at optimising opportunities and advantages presented by digital technologies (Mihardjoet al., 2019). Individuals or organisations in the digital technology era can comprehensively transform teams, entire organisations, and employees into digital thinkers by leveraging digital insights, digital decision-making, digital

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implementation, and digital guidance, ensuring the achievement of their objectives. DL is described as the ability to influence people to truly embrace the changes (Peng, 2022). Past research indicates that with the formation and development of DL concepts alongside Industry 4.0, 77% of employees believe new leaders are needed for organisational digital transformation(Oberer & Erkollar, 2018).Both DL and innovation management impact sustainable competitive advantage, with DL having a greater influence on driving innovation management (Wasono & Furinto, 2018).

At the characteristic level, digital leaders exhibit an open-minded attitude towards new possibilities, a continual curiosity, foresight, engagement, guidance, collaboration, and a network-oriented approach (Zeike et al., 2019). Innovation and creativity are also listed as characteristics of digital leaders (Kane et al.,2015). At the strategic level, despite the emergence of a new normal characterised by technology-driven changes, research on successful organisations suggests that digitisation relies less on the adoption of technology and more on leadership and its strategy (Carroll & Conboy, 2020). According to El Sawy et al. (2020), DL also refers to leaders developing digital strategies for the success of the organisation's internal and business ecosystem. Therefore, without a digital leader equipped to execute a plan, the adoption of a digital strategy can be hindered (Canhoto et al., 2021). At the institutional level, DL plays an indispensable role in successfully integrating digital technologies. Digital leaders are required to foster positive policies and preparedness (Brunner et al., 2023). On a personal level, the accelerated pace of globalisation and technological change have to a certain extent, heightened complexity, and uncertainty. Therefore, there is a need to develop digital leaders with the necessary skills to assist organisations in overcoming the inherent obstacles of digital transformation (Sousa & Rocha, 2019).

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Digital leaders require a vision for digital transformation, talent and expertise, and a strategic plan for business transformation (Erhan et al., 2022). Digital leaders need to have foresight, strategic planning, digital skills, and disruptive talents. Their ability to inspire their subordinates exhibits a strong and successful leadership style in driving digital transformation (Benitez et al., 2022; Khaw et al., 2022; Mihardjo et al., 2019). Top-level executives with higher DL skills may experience better mental health, independent of gender or age (Zeike et al., 2019). Researchers often emphasise that the cognitive skills of digital leaders can address business issues and manage complexity and uncertainty (Gilli et al., 2023; Schwarzmüller et al., 2018). Altınay Aksal (2016) defines DL as the ability to follow current technologies and reconstruct knowledge based on their foundation. DL can navigate disruptive environments and foster innovative leadership through a digital mindset, awareness, and expertise (Cortellazzo et al., 2019). Helfat and Peteraf (2015) employed various company performance metrics and found that the effects of CEO management strategies have significantly grown over time. The variance in company performance attributable to CEOs rose from an average of 12.7% during the period from 1950 to 1969 to an average of 25% from 1990 to 2009.

At the organisational level, Stana et al. (2018) define DL as a technology-enabled, socially influential process that influences attitudes, emotions, thoughts, actions, and performance. DL is considered to be embodied by leaders with a risk-taking culture, flexible, collaborative with employees, adopt transformative strategies, and have an open attitude towards innovation (Sow & Aborbie, 2018). DL refers to leaders who understand the business, possess advanced communication skills, master digital technologies, and can guide employees using digital devices (Benitez et al., 2022). At

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the relationship-oriented level, DL requires a high degree of flexibility, incorporating both traditional and modern leadership behaviours, depending on the specific circumstances (Weber et al., 2022). Digital strategy of digital Leaders can be explained using the Strategic Action Field theory which states since there are many employees and leaders in a group, team, or organisation, digital leaders can collaborate with these people to drive digital change (Peter et al., 2020). Additionally, regarding decision-making, traditional leaders rely on hierarchical systems (Pawar &Dhumal, 2024). Digital leaders, on the other hand, operate collaboratively and face limitations in the channels through which they gather information, and this leads to slower decision-making (Pawar &Dhumal, 2024). Apart from developing new platforms, changing management, promoting cultural improvement and collaborative learning, traditional leadership also depends on external consultants, while DL is characterised by self-management (Zada, 2022). Notably, DL is characterised by attributes such as innovation, digital skills, a robust network, collaboration, cooperation, and vision (Hensellek, 2022).

Therefore, describing DL as an umbrella term encompasses multiple interrelated perspectives. It represents a combination of various concepts from established leadership theories, such as strategic leadership (Samimi et al., 2022), servant leadership (Lusiani et al., 2020), transactional leadership (Barker, 2001), and participative leadership (Zhu et al., 2018). The combination of technological utilisation and transformational leadership is also referred to as DL (Mihardjo et al., 2019). According to Mihardjo and Rukmana (2019), scholars claim that DL involves integrating traditional leadership culture and maximising the use of digital technology to enhance organisational value. Hence, different leadership styles should be applied

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for different developmental stages. Throughout history, technological changes have shaped different types of leadership. Leadership has evolved based on models such as hierarchy, power, authority, and personality. However, in the digital economy, digitisation significantly alters leadership styles and skills (de Araujo et al., 2021). This aligns with the findings of Sow and Aborbie (2018), indicating that digital leaders should employ a combination of leadership approaches to actively influence the strategic outcomes of the digitalisation process.

However, although technology can facilitate transformation, relying solely on technology will not guarantee success(Abbu et al., 2022). Moreover, traditional leadership approaches are no longer effective in this new environment. In a digitalised context, leadership must evolve into DL (Abbu et al., 2022). To further address the disruptive issues of digital technology, digital leaders must spearhead the process of digital transformation. To effectively handle disruptive change and transition their enterprises into Industry 4.0, digital executives need to take the lead in digital transformation (Klein, 2020). Literature suggests that lack of appropriate senior leadership is a key reason for the failure of digital transformation in many companies (Philippart, 2022).

2.5.2 Digital Leadership and Employee Attitude and Behaviours

The process of organisational involvement in digital transformation has resulted in a significant gap between employee capabilities and the evolving work demands. Therefore, there is a need to develop more effective management strategies (Whysall et al., 2019). According to the Upper Echelons Theory (Hambrick,1984), DL has a significant impact on employee innovation. Employees' perceptions of DL positively

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and significantly influence various aspects of their innovative work behaviours (Erhan et al., 2022). Due to the significant advancements in digital technology, there is a substantial gap between employees' capabilities and the continuously evolving job requirements(Whysall et al., 2019). Therefore, it is necessary to establish a more effective leadership style and HRMP (Whysall et al., 2019). To overcome the challenges associated with digital transformation, leaders must develop a combination of digital and human skills, primarily focusing on the ability to communicate effectively in a digital environment, fostering collaboration among geographically dispersed followers, and encouraging proactivity and a transformative mindset (Cortellazzo et al., 2019). DL positively influences employee creativity, with employee job crafting mediating the relationship, and the fit of individuals and the organisation positively moderating the relationship between DL and employee job crafting (Zhu et al., 2022). Digital leaders are willing to empower employees to achieve transformation goals and can inspire employees to use digital technology to innovate (Putra et al., 2023). DL encourage employees to innovate, motivate employees, maintain sustainable communication with employees, and develop digital strategies in the digital environment (Sagbas & Erdogan, 2022). DL can identify and develop the necessary skills and digital talents to engage all business individuals in the digital process (Sow & Aborbie, 2018).

Thus, DL is primarily responsible for managing the operation of processes, motivating employees, establishing organisational objectives, and enhancing organisational culture (Iskamto, 2020). Employees' inventive and innovative capabilities are also directly influenced by DL(Sasmoko et al., 2019). Employees are social beings and are the primary assets of a company, serving as planners, executors, and controllers. They

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are consistently active within the company, and the thoughts, emotions, and desires of leaders can impact their work attitudes (Iskamto, 2020; Iskamto et al., 2021).

2.5.3 Digital Leadership and Dynamic Capability

The market turbulence of the digital age, also known as VUCA (Volatility, Uncertainty, Complexity, and Ambiguity), involves digital transformation. This transformation enables businesses to perceive opportunities, seize design for implementation and innovation, and transform organisations to embrace new capability paradigms (Yeow et al., 2018). For an organisation with dynamic capabilities, leaders play a crucial role (Schoemaker et al., 2018). Leaders are considered particularly crucial for creating, reconfiguring, and deploying organisational resources. This is because their positions and roles influence the behaviour of other leaders within the company, granting them control over decisions related to resource allocation and strategic direction (Khaw et al., 2022). A new term developed in the digital era defines leaders as digital leaders, who are dynamic in nature and central to driving digital transformation (Oberer & Erkollar, 2018). Specifically, the dynamic management capabilities of leaders enable the company to effectively identify external market opportunities that are aligned with organisational resources. They can then reconfigure and deploy these resources to pursue market opportunities, motivating employees to adjust resources in support of strategic transformation efforts (Samimi et al., 2022). DL has a strong direct and indirect relationship with dynamic capabilities, but the path of capability development depends on the evolution of innovation capabilities driven by market-oriented DL (Sasmoko et al., 2019). There is a strong direct and indirect relationship between DL and dynamic capabilities, and the robust pathway of capability development is determined by the

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development of innovation capabilities driven by market-oriented DL (Mihardjo & Rukmana, 2019). Due to market changes in the digital era, innovation based on dynamic capabilities accelerates when aligned with market orientation. DL will significantly facilitate the perception towards market changes, seize opportunities, and reconfigure the organisation (Mihardjo et al., 2019). Moreover, scholars have empirically demonstrated that DL has a substantial impact on dynamic capabilities (Mihardjoet al., 2019; Mihardjo & Rukmana, 2019).

However, since the emergence of EDC as a concept stemming from DCT, there has been an emphasis on the importance of employee abilities in enhancing organisational competitiveness in dynamically changing markets (Bieńkowska & Tworek, 2020). While scholars have repeatedly mentioned that positive impacts on EDC can result from effective strategic guidance and incentives implemented by digital leaders (Bieńkowska et al., 2021; Bieńkowska & Tworek, 2020, 2024; Tworek et al., 2023). However, the significance of their relationship in empirical studies remains unproven. While past research has focused on scenarios in dynamic markets, the effectiveness of these relationships in the digital market still requires further validation.

2.6 Digital Capability (DC)

2.6.1 Characteristics of DC

Managing digital transformation may pose challenges and require adequate preparation in terms of resources and capabilities (Konopik et al., 2022). DC is increasingly promoted as a source of sustainable advantage in the sense of being difficult to imitate, rather than being stable over a specific period (Mao et al., 2024). DC may encompass three constituent elements, including agile digital infrastructure,

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digitisation-related human capital, and high-quality collaborative partnerships (Xie & Wu, 2024). As it relates to digital products, a widely used definition of DC is the ability to mobilise and deploy technology-based resources in combination or coexistence with other resources and capabilities (Wiesböck et al., 2020). The flexibility of digital infrastructure refers to an organisation's ability to deploy and integrate various communication, and software and hardware components to deliver technological solutions rapidly and seamlessly (Li et al., 2021). Additionally, DC encompass the necessary skills and attitudes that individuals and organisations must cultivate in the modern era of digitalisation (Hartono & Halim, 2020). In the digital era, organisations are increasingly leveraging digital tools to optimise and enhance process efficiency, ensuring sustainable operations (Zhen et al., 2021). Moreover, due to environmental changes and turbulence, DC is becoming increasingly popular (Zhen et al., 2021).

From a technological perspective, DC can be categorised into three aspects: Internet of Things capability, big data analytics capability, and cloud computing capability (Edu et al., 2020). Lunka et al. (2017), through a case study on the manufacturing industry in Europe, categorises DC into intelligent capabilities, connectivity capabilities, and analytical capabilities (Lenka et al., 2017). Khin and Ho (2019) measure DC through five projects: acquiring essential digital technologies, identifying new digital opportunities, coping with digital transformation, mastering cutting-edge digital technologies, and utilising digital technologies to develop innovative products. Integrating digital technologies with the digitised skills of professional talents requires DC. DC can be divided into reconfiguring digital resources and conventions within the enterprise, seizing the DC of the enterprise, and discerning opportunities and

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threats (Annarelli et al., 2021).The dynamic characteristics of DC in the process of capacity building are essential to address the changing environment of market "emergence, collision, fragmentation, development, and extinction" and to initiate business restructuring as a competitive action (Warner & Wäger, 2019).

From a strategic perspective, DC can assist businesses in identifying strengths and weaknesses, optimising digital transformation initiatives, and cultivating an improved roadmap for digital transformation (Gökalp & Martinez, 2021). In the production process, personnel can collect data through IOT devices and utilise analytical tools for predictive analysis of product quality trends. This digitalised, comprehensive and integrated approach has implications for organisations in social, technical, process, and management aspects, known as DC (Gökalp & Martinez, 2021). In the manufacturing industry, DC also signifies the ability for data collection, connectivity, and analysis(Edu et al., 2020). Wielgos et al. (2021) categorise DC into digital strategy, digital integration, and digital control.

From an organisational perspective, DC measure how well IT staff learn new technical abilities. Digitalisation is a set of connected or collaborative procedures that turn inputs into outputs to promote organisational digitalisation. According to literature evaluations and surveys, the most important parts of digitalisation for firms are organisational strategy and skill augmentation (Gökalp & Martinez, 2021). From a human resource standpoint, although DC is related to digital technology, DC extends beyond technical skills. In fact, DC is also associated with the ability of human resources to leverage digital technology for collaborative efforts and innovation (Nasiri et al., 2020).

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Hence, DC does not only reshape organisational structures but also transforms societal structures (Erro-Garcés & Aramendia-Muneta, 2023). Moreover, DC aids businesses in adapting to dynamically complex changes in internal and external environments and expands the depth and breadth of value creation. It is a crucial prerequisite for sustaining a competitive advantage in enterprises (Annarelli et al., 2021; Leão & Da Silva, 2021).

2.6.2 Digital Capability (DC) and Employee Dynamic Capability (EDC)

Based on the DCT, the concept of DC is considered a dynamic capability. It encompasses the capacity to adapt and innovate by creating new products and business processes in response to technological advancements (Gupta & Bose, 2022). DC includes perceiving, grabbing, and transforming digital opportunities, responding to digital transformation, and creating services/processes with digital technology (Gökalp & Martinez, 2021). In the context of digital transformation, DC consists of three elements: data capture capability, connectivity capability, and analytical capability (Lenka et al., 2017; Warner & Wäger, 2019). DC complements its digital orientation because only those with management skills to handle new technologies will be prepared to accept them and be willing to commit to transforming them into new products (Warner & Wäger, 2019). Businesses with digital transformation must demonstrate commitment and readiness to adopt new technologies which will enable them to create competitive advantages through innovative goods (Garzoni et al., 2020). Drawing on DCT, DC can be regarded as a dynamic ability, characterised by an organisation's capacity to create new products and processes and the ability to adapt to the constantly changing market environment (Khin & Ho, 2019). DC supports the initiation, development, and application of digital innovation, providing a

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comprehensive mechanism for coherence and integration, and thus, is essential to value co-creation (Marcos-Cuevas et al., 2016).

Therefore, DC possesses characteristics of DCT. In today's digital era, DC refers to an organisation's ability to acquire foundational digital technologies, discover new digital opportunities, respond to digital transformation, master cutting-edge digital technologies, and use digital technology to develop innovative products by leveraging digital infrastructure, digitally related human capital, and high-quality partnerships (Khin & Ho, 2019). Dynamic capabilities are defined as the ability of an organisation to integrate, build, and reconfigure internal and external resources to adapt to rapidly changing environments (Teece, 2018; Teece et al., 1997). Therefore, DC is fundamentally similar to dynamic capabilities, with the sole distinction being that organisations use digital resources to optimise internal management to adapt to rapidly changing environments (Khin & Ho, 2019).

Furthermore, the academic community has not yet clearly distinguished between dynamic capabilities and EDC. The concept of EDC was first introduced in 2022, marking its emergence as a new concept in academic research (Bieńkowska & Tworek, 2020). EDC is the integration, establishment, and reconfiguration of employee skills to respond to quickly changing circumstances that affect job performance in dynamic markets (Bieńkowska & Tworek, 2020). It also includes the capabilities to identify environmental changes, react to such changes, proactively solve problems, and continuously learn (Bieńkowska et al., 2021; Bieńkowska & Tworek, 2020; Phan et al., 2022).

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In conclusion, DC encompasses the ability to effectively utilise digital technologies to collaborate with digital and human resources, thereby driving digital transformation. EDC also reflect the characteristics of the DCT. DC is derived from organisational support and therefore, contributes to employees' ability to drive digital transformation with digital technologies. However, research on the relationship between these elements remains a gap in the current literature.

2.7 High-Involvement Human Resource Management Practices (HI-HRMP)

2.7.1 Characteristics of HI-HRMP

The origin of HRM as a discipline can be traced back to the early 1970s and the development of the human capital theory. According to this theory, it is more appropriate to view human resources as wealth (as a resource) that is opposite to costs (Černe et al., 2023). The basic purpose of HRMP is to optimise employee-job interaction (Zhou & Zheng, 2024). The effectiveness of HRMP is contingent upon three prerequisites: firstly, employees must possess highly developed skills; secondly, employees should be motivated to utilise their skills; and thirdly, an appropriate platform should be provided to enable employees to contribute their efforts (Huo et al., 2015; Leroy et al., 2018a). Additionally, organisational attention to HRMP has long been a strategic management task for nearly every organisation (Keding, 2021). HI-HRMP is widely adopted by companies that deem employees crucial to their success. These practices aim to encourage employees to engage in work with greater capacity and enthusiasm (Hossain et al., 2023). Scholars believe that when employees possess comprehensive skills, are motivated to apply these skills and have a platform to contribute their skills, HI-HRMP will emerge (Huo et al., 2015; Leroy et al., 2018).

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These requirements are referred to as HI-HRMP and have been validated to significantly enhance individual performance (Rubel et al., 2023) and operational levels (Al-kharabsheh et al., 2023).

Scholars have given different definitions of HI-HRMP. HI-HRMP is defined as a unified HRMP consisting of three main categories: ability, motivation, and opportunity (Shin et al., 2018). Shin et al. (2018) explicitly pointed out that HI-HRMP included a set of HRMP that aimed at advancing employee skills, enhancing employee incentives, and improving employee participation. HI-HRMP also refers to management strategies that leverage employee involvement (Yang, 2012). HI-HRMP aims to motivate employees by enhancing their organisational knowledge, skills, and talents (Rubel et al.,2017). It aims to promote employee participation, empowerment, and responsibility by providing them with more autonomy and decision-making power, and creating a supportive work environment (Shin et al.,2016). HI-HRMP is a well-recognised organisational technique designed to develop HRM skills and promote employees' involvement in creative work behaviour and employee functional flexibility (Yasir& Majid,2020). HI-HRMP, including training, compensation, and occupational safety and health practices, can support HR managers in achieving organisational sustainability (Cahyadi et al., 2022). While scholars may differ in their delineation of HI-HRMP, there is a common feature of motivating employees to achieve organisational goals. HI-HRMP includes plans, regulations, and practices designed to increase employee participation in decision-making, enhance knowledge and skills, and promote growth (Rubel et al., 2017, 2023). Moreover, based on the RBT, HRM scholars believe that HR strategies are more likely to generate competitive advantages by leveraging unique and valuable employee-based resources (Rubel et

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al.,2023). Furthermore, different HR strategies lead to the emergence of different employee resources (Collins, 2021).

Cao et al. (2022) argue that HI-HRMP stimulates employees' innovation capabilities through knowledge sharing in the forms of product and process innovation. They categorise HI-HRMP into five practices: selective hiring and recruitment, training and development, performance appraisal, information sharing, and performance-based rewards (Cao et al., 2022). However, there is limited research indicating the impact of HI-HRMP on how employees adapt to new technologies (Kee & Rubel, 2021).

This research focuses on HI-HRMP, primarily encompassing five key areas:

- Capability development, empowerment, fair rewards, information sharing, and recognition (Rubel et al., 2023; Shin et al., 2018). With capability development, employees enhance productivity, and the organisation is willing to invest in them beyond short-term returns (Blanka et al., 2022). Organisations also enable employees to equip themselves with relevant skills and expertise to use new technologies to achieve digital advancements (Rubel et al., 2017).
- Empowerment allows employees to assume various roles and responsibilities, enabling them to have a greater impact in their work while enjoying increased autonomy (Rubel et al., 2017b). It can also strengthen employee commitment and foster emotional attachment (Shin et al., 2018). When an organisation empowers employees, it enhances the utilisation of knowledge and aligns technology with their work and decision-making, making the success of digital transformation. The term 'Fair rewards' refers to the perceived fairness in various job outcomes, including compensation terms, performance evaluations, and job assignments (Huo et al., 2015).

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- Appropriate rewards can promote employee motivation, which will ultimately facilitate and improve an organisation's technological adaptability, resulting in favourable outcomes(Kee & Rubel, 2021).

- Information sharing contributes to the internalisation of organisational goals and values, enhances mutual trust among employees, and makes employees feel valued by the organisation (Rubel et al., 2017). Therefore, this research posits that information sharing on new technologies aids employees in acquiring information, applying knowledge, and enhancing the utilisation of new technological knowledge. In an information-rich environment, information sharing plays a crucial role in assisting employees adapt to technology.

- Recognition refers to non-monetary rewards provided by organisations in the form of appreciation for high-quality work and achievements. This includes considering employee suggestions and providing positive feedback (Renkema et al., 2021). Recognition can motivate employees to invest more effort in innovation, ultimately fostering and enhancing their ability to adapt to new technologies.

2.7.2 HI-HRMP and Employee Attitude and Behaviours

Development of a company's potential staff is vital to its success; hence, companies seek out and retain enthusiastic workers to maintain a competitive workforce (Iskamto, 2020). Based on the RBT, firm's resources should provide solid support to the importance of the HI-HRM system, and can enhance its competitive advantage by acquiring VRIN resources and capabilities (Cahyadi et al., 2022). A classical intangible resource, human capital, can be developed with HI-HRMP as HI-HRMP helps build a workforce comprising committed employees with a deep tacit knowledge that is hard to imitate or transfer. Research indicates that HI-HRMP significantly influences employees' innovation capabilities, and knowledge sharing moderates the

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relationship between them (Cao et al., 2022). The significant impact of HI-HRMP on employee innovative behaviour implies that employees perceive HRMP as signals from the organisation, indicating that their innovative actions are valued, appreciated, and encouraged (Bos-Nehles et al., 2017). HI-HRMP encourages employee engagement in various initiatives to cultivate their interdisciplinary skills in human capital development and implementation (Revuelto-Taboada et al., 2021).

In contrast, traditional HRMPs tend to be more bureaucratic and hierarchical, with less emphasis on employee participation and empowerment. With HI-HRMP, it can influence employees' attitudes towards technology adaptation, which assists management to focus on participation in the implementation of new technologies (Rubel et al., 2017). This happens as HI-HRM influences employees' readiness to adapt to new technologies (Rubel et al., 2017).

HI-HRMP can generate a sustainable competitive advantage (Rubel et al., 2023). Managers should adopt different approaches to support employee development and, through HRM processes, create more opportunities for employees to embrace technology during the digitalization process (Greeven & Williams, 2022). A learning orientation strengthens the relationship between HI-HRMP and employee creativity (Gu et al., 2023). Past studies have also stated that employees' intrinsic job motivation moderates the relationship between HI-HRMP and employee creativity (Shin et al., 2018). Another study found that HI-HRMP positively impacts employee innovative behaviour, and this relationship is moderated by affective commitment and job autonomy (Renkema et al., 2021). Furthermore, findings from research conducted in the Chinese information technology industry indicate that the presence of HI-HRMP

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enhances employees' inclination towards proactiveness in their work (Alikaj et al., 2021).

Indeed, HI-HRMP influences the development of EDC, although, at this point, EDC has not been studied as a separate topic (Bieńkowska et al., 2021). The comprehensive of the discussion above demonstrates that HI-HRMP exerts positive effects on employees' attitudes and behaviours (Renkema et al., 2021; Rubel et al., 2017; Shin et al., 2018). While past research has also noted that in dynamic markets, organisations implementing effective HRMP positively influence EDC, there is still a lack of empirical evidence confirming the effectiveness of their relationship (Bieńkowska et al., 2021; Bieńkowska & Tworek, 2020; Tworek et al., 2023). Additionally, there is still a study gap in the field concerning the interaction between HI-HRMP and EDC, particularly in the context of dynamically shifting digital markets. Thus, the purpose of this research is to close this gap.

2.8 Organisational Learning (OL)

2.8.1 The Attributes of OL

Due to its diverse perspectives, OL is also an elusive concept (Huber, 1991). Huber (1991) views it as a combination of four processes: information acquisition, information distribution, information interpretation, and organisational memory, all aimed at achieving performance through learning. Jones (2013) defines OL as the process of information acquisition, interpretation, and cognitive and behavioural changes that influence innovation. OL encompasses a series of knowledge management processes that enable individuals and groups at various levels of the organisation to acquire, generate, store, share, and apply knowledge (Mollah et

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al.,2023). Additionally, it positively influences employee performance by enhancing employees' abilities to solve problems and make decisions efficiently, achieve knowledge strategic objectives, and foster effective local and global leadership (Kordab et al., 2020; Li & Wang, 2022; Mollah et al., 2023).

OL also generates organisational knowledge, not only to maintain competitive advantage but also to bring about new markets (Zhang et al., 2023). OL is the effort of companies to utilise personal and social capital information to achieve the company's innovation potential (Bratianu, 2018). These innovative activities may be constrained by the existing routines, processes, and experiences of the organisation, referred to as knowledge inertia (Xie et al., 2016). Therefore, when organisations overcome knowledge inertia through OL, innovation is likely to increase (Xi et al., 2016). OL is of utmost importance in an organisation as it is associated with the process of creating value from the organisation's intangible assets (Chen & Zheng, 2022). It integrates concepts from several different domains such as organisational behaviour, HRM, artificial intelligence, and information technology (Manuti et al., 2015). Lin and Lee (2017) believe that OL is a continuous process that values learning most in an organisation. Discussions may also delve into the organisations' vision for future development and ways to foster innovative thinking beyond the present restrictions. Learning and information exchange across departments improves mutual understanding and helps achieve a common goal (Urrutia Pereira et al., 2022).

OL is a place where individuals constantly grow their capacity to create the results they desire by creating new and expansive patterns of thought that set free collective ambitions and allow people to continuously learn how to view the broader picture

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(Russell et al., 2018). OL is also related to the accumulation of individual knowledge and the communication structure with the external and internal environments of the organisation (Xie, 2019). It serves as a means of learning to address the difficulties in knowledge communication, increased innovation, and problem-solving in the VUCA environment (Pulsiri & Vatananan-Thesenvitz, 2018), and helps develop external knowledge through new business activities within the organisation (Cousins, 2021). Learning organisations are organisations that have developed a continuous capacity to adapt and change. All organisations learn, whether they consciously choose to do so or not; it is a fundamental requirement for their continued existence (Zhang et al., 2023). Knowledge acquisition, distribution, cooperative interpretation, and organisational memory development are the four components of OL (Pulsiri & Vatananan-Thesenvitz, 2018). According to various definitions, OL involves increasing learning and knowledge, enhancing each member's capabilities, mutually compensating for strengths and weaknesses, developing capabilities and skills, learning to collectively perceive the whole and developing sustainable capabilities (Lin & Lee, 2017; Muniroh et al., 2022).

2.8.2 OL and Digital Transformation

The digital economy, characterized by volatility, uncertainty, complexity, and ambiguity (VUCA), presents a highly disruptive environment that can pose potential penalties for organisations with a progressively focused approach (Su et al., 2023). Continuous OL, which relies on the accumulation of individual knowledge and the communication structure between the external and internal environment of the organisation (Cousins,2012), is crucial for individuals to navigate in the current digital era. Surveys indicate that 90% of individuals need to update their skills annually to

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work effectively in the digital world; 44% express the need for constant and efficient skill updates, and in companies with well-developed digital advancements, as many as 59% of respondents are satisfied with their companies' preparedness for changes in the digital environment (Kane et al., 2018). Moreover, learning practices such as training, teamwork, continuous experimentation, and sharing experiences and knowledge sources can facilitate the success of organisational transformation driven by digital transformation (Hortovanyi & Ferincz, 2015), particularly in SMEs, as OL serves as a catalyst for digital transformation. Furthermore, there is a high correlation between perceptual and learning capabilities and digital transformation (González-Varona et al., 2021; Matarazzo et al., 2021). Therefore, in today's rapidly evolving digital technology landscape, both individuals and organisations need to adapt to changing work scenarios by updating existing knowledge through continuous learning.

2.9 Employee Dynamic Capability (EDC)

2.9.1 Attributes of EDC

The continuous evolution and dynamic changes within modern organisations have contributed to the volatile nature of contemporary work and workplaces. Although EDC is crucial for enhancing performance objectives in dynamic markets, there remains a scarcity of research that analyses the nature and role of these capabilities in today's organisations (Bieńkowska & Tworek, 2020). In this context, modern employees are crucial organisational assets that determine sustainable development; hence, their expectations must be redefined (Law et al., 2017). Phan et al. (2022) affirm this perspective, asserting that EDC enhances the sustainability of enterprises. Moreover, employee work motivation and proactivity are key factors that provide

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organisations with a sustainable competitive advantage (Al-kharabsheh et al., 2023). Contemporary organisations regard employees not merely as crucial organisational assets but also as creators of novel capabilities, facilitating adaptability to environmental changes—a pivotal factor in realising sustainable development (Phan et al., 2022). Moreover, given the critical role of employees in organisational sustainability, the concept of EDC has emerged to address this research gap, positioning employees as fundamental elements of DCT (Bieńkowska & Tworek, 2020a).It is important to consider the importance of establishing EDC during digital transformation (Phan et al., 2022). However, previous research has not shifted DCT from the organisational level to the individual level (EDC) although in the dynamic digital market, employees are the most crucial resource since they remain the primary users and utilisers of technology (Shao et al., 2022). It must be emphasised that all employees, not just managers, inherently need to harness their dynamic capabilities to impact organisations and address distinct scientific questions (Phan et al., 2022). The established concept of dynamic capabilities may not directly translate to EDC due to the different subjects of analysis, resulting in research gaps. Hence, a shift in perspective is required. Analysing employees and their capabilities rather than treating the organisation as a singular entity where employees are merely constituents should now become the focus (Bieńkowska & Tworek, 2020). According to Teece et al., (1997), EDC refers to the capacity to effectively combine, construct, and adapt employees' capabilities to address the demands of a rapidly evolving market. This environment directly impacts employees' performance in the workplace (Bieńkowska & Tworek, 2020). EDC refers to adaptability in addressing current challenges, as well as the long-term improvement of job processes (Bieńkowska et al., 2021). This understanding of EDC is beneficial to be incorporated as an element within DCT. In

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other words, this element is associated with individual employees and involves the work that an employee performs in a given workplace (Bieńkowska & Tworek, 2020).

Given the pivotal role employees play in shaping dynamic capabilities, scholars increasingly highlight the importance of EDC in today's work environment (Bieńkowska et al., 2021; Phan et al., 2022; Tworek et al., 2023). EDC can be explained across four dimensions: environmental sensitivity (the ability to sense changes and recognise opportunities and threats that may affect workplace performance); adaptability to environmental changes (the capability to take preventive measures and avoid issues in the workplace); ability to proactively address issues in the workplace if they arise and innovate in the workplace; and the ability for continuous personal development and learning (Bieńkowska & Tworek, 2020). Additionally, ongoing readiness for learning is crucial for contemporary employees. Zhang et al. (2022) emphasise that employees are compelled to adapt to new ways of working, primarily due to the more frequent occurrence of technological innovations than ever before. Hence, it is essential to continuously improve the knowledge and skills required to implement such technological innovations (Phan et al.,2022). In addition, the ability to rapidly and effectively learn new methods of task execution and to adapt to changing processes and procedures seems to be paramount (Girod & Whittington, 2017; Phan et al., 2022), leading to the emergence of the job-based learning concept in the past decade. It underscores the necessity to integrate continuous learning and personal development as integral components of the modern job description (Pulsiri & Vatananan-Thesenvitz, 2018).

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DCT is particularly important in the modern, dynamic, and changing work environment as sustainability cannot be achieved without dynamic capabilities (Liboni et al., 2023). Currently, few scholars have conducted empirical studies to influence EDC from the perspective of organisational support variables (OSV), and the following few pieces of literature mention these factors in the section on future research proposals (Al Wali et al., 2023; Alwali, 2023; Bieńkowska & Tworek, 2020; Tworek et al., 2023; Wali et al., 2020). In turbulent market environments, scholars mentioned the implementation of effective management practices. Top leaders and HR managers should pay attention to EDC (Bieńkowska et al., 2021; Bieńkowska & Tworek, 2020). Al Wali et al. (2023) also believes that HRM plays a crucial role in identifying candidates with high levels of EDC through recruitment using psychological tests in public hospitals as top management members of public hospitals play a key role in creating an enabling environment for the development of necessary EDC (Al Wali et al.,2023). Fostering an environment that promotes EDC through diverse work teams and self-management is crucial. Understanding EDC during crises provides insights for decision-making on training, development, and support to enhance adaptability during crises (Tworek et al., 2023). According to Phan et al. (2022), organisations have a positive impact on the adoption of fintech by enhancing the EDC, enhancing employees' innovative work behaviour, and improving overall employee performance. Empirical research conducted by Wamba et al. (2017) found that process-oriented dynamic capability has a positive impact on job performance through organisational support in market research companies. In dynamic and changing markets, organisations play a key role in job performance by enhancing EDC (Luo & Tworek, 2023).

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Furthermore, it was found that OSV influences employee attitudes and behaviours (as a mediating variable), promoting employee performance (Adnan et al.,2022; Kurniasih et al.,2022; Lumunon et al., 2021). Moreover, in a dynamic digital market, scholars have repeatedly mentioned that EDC has a superior impact on employee performance compared to attitude and behaviour variables in fast-paced markets (Alwali, 2023; Bieńkowska et al., 2021; Bieńkowska & Tworek, 2020). Therefore, to sustain a competitive advantage, organisations must cultivate a work environment that supports the development of employees' attitudes and behaviour and EDC (Bieńkowska et al., 2021a; Bieńkowska & Tworek, 2020; Phan et al., 2022; Tworek et al., 2023).

2.10 Competition, Competitiveness and Competitive Culture

2.10.1 Differentiation of Competition and Competitiveness

Typically, companies with a competitive advantage exhibit stronger performance, while countries with a competitive environment enjoy better economic well-being (Wang et al., 2018). Competition, from the perspective of limited resources, is defined as the concept that describes individuals or organisations pursuing the same scarce resources or rewards (Kohn, 1992). It is also considered critical for the effective allocation of scarce resources and for promoting creativity and innovation (Eső et al., 2010). Another perspective on competition stems from social comparison. Humans have an innate drive to become the best (Schrock et al., 2016). Researchers claim that humans enjoy outperforming others and engage in horizontal social comparison for superiority (Garcia et al., 2020). This is particularly because outperforming others

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makes humans feel proud and successful (Garcia et al., 2020). Both perspectives regard competition as an end (Yang, 2020).

Competitiveness is considered to emanate from the social context and the relationship styles of individuals within the group (Handley & Mathew, 2020). In the broader literature, competitiveness is considered a significant individual difference variable, influencing behaviour across various social domains and interpersonal relationships (Fong et al., 2021; Spurk et al., 2019). Studies have investigated competitiveness in various interpersonal contexts under competitive conditions, with particular relevance in work environments (Swab & Johnson, 2019). Competitiveness is defined as an important individual difference variable that influences social and interpersonal behaviour (Fong et al., 2021). Highly competitive individuals continually monitor their own and others' performances to ensure that they outperform others. They place a high value on outperforming others and therefore, expend extra effort in preparation and execution (Swab & Johnson, 2019). Competitiveness is also considered a form of achievement motivation because individuals' competitiveness is a motivation achieved through comparison with others in a competitive environment (King et al., 2012). Competitiveness involves an individual's ability and willingness at a micro level to surpass others, or at the very least, exceed their own performance (Baumann & Winzar, 2017). In accordance with the evolution of competitiveness theory (Baldauf et al., 2014), employing valuable employees is regarded as the most precious resource for engaging in internal organisational competition in SMEs (Bilan et al., 2020).

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2.10.2 Competitive Culture (CC)

Cultural values are considered a key factor influencing competitiveness and performance at both the national and organisational levels (Chen & Lin, 2020), especially in East Asian countries such as China, Japan, and Korea where Confucianism has a significant influence. The fundamental cultural values are considered an important variable in shaping organisational culture that affects economic growth, encourages hard work, and enhances corporate productivity(Yang,2020). Recent research calls for more attention to the role of Confucian cultural values in understanding competitiveness and performance in the work environment (Viengkham et al., 2018). Confucian cultural values are known to influence competitiveness and high levels of academic performance among students in East Asian societies such as China, Japan, and Korea (Baumann & Winzar, 2017).

Past studies reveal that Chinese cultural characteristics including Confucian work ethics and hard work shape Chinese customer service employees' attitudes and behaviours, which then affect service quality and performance (Tsang, 2011). Competition is not always viewed negatively. In the East, for instance, the Japanese view competition as self-improvement. In the West, Canadians see it as goal attainment, and Hungarians view it as a selection process although some view their rivals as enemies (King et al., 2012). Cultural values and dimensions have been recognised as crucial factors affecting the competitiveness and performance of nations and firms (Yang, 2020). Specifically, Confucianism, a core value in China, Japan, and Korea, has been linked to Asian economic growth and the creation of an organisational culture that encourages hard work and boosts productivity (Yang,2020).

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Organisational culture refers to the beliefs, knowledge, attitudes, and practices that shape employees' language, values, behaviours, and cognitive processes (Knein et al., 2020). Organisational culture is influenced by its activities and life cycle stages (Knein et al., 2020). There is growing acknowledgement that top-level management consciously or unconsciously shapes an organisation's culture. Hence, future top management must foster a thriving organisational culture during change (Dhir,2019). Since this study is conducted in China, competitive cultures are included as control variables. Past research has also shown that performance is affected by a competitive culture (Viengkham et al., 2018). By concentrating on specific regions in China, this study aims to delve deeper by incorporating CC into this investigation.

2.11 Competitive Climate (CC), Dynamic Capability, and Performance

2.11.1 Traits of Competitive Climate (CC)

External environmental pressures can also lead to employees exhibiting different competitive behaviours (Turel & Gaudioso, 2018). Organisations can boost employee performance by improving their CC (Xie & Wu, 2024). A competitive environment motivates individuals to strive to outperform others (Grant & Shandell, 2022). CC is an organisational climate where employees must compare their performance to others, causing competitiveness and pressure (Khon 1992). Due to the scarcity of resources being a critical issue within organisations, employees engage in competition for organisational resources (Grant & Shandell, 2022). For instance, as employees cannot have equal access to salary increments, promotions, and other rewards, they begin to perceive competition in the workplace (Murtza & Rasheed, 2023). The extent of CC depends on employees perceiving their service performance evaluations and outcomes

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(such as compensation and promotion) as relative to their peers. As service organisations primarily strive to deliver excellent service, internal competition becomes a natural and pervasive factor in their organisational climate and culture (Handley & Mathew, 2020). According to Wang et al (2018), CC has been found to enhance job performance and business success.

Therefore, organisational psychologists consistently argue that individuals' level of performance varies based on the interaction between their personality and environmental perceptions, such as perceived climate (Spurk et al., 2019). CC has a positive effect on creative work engagement, and studies indicate that designing a work environment that is competitive and encourages mentoring relationships between supervisors and subordinates may stimulate creativity in the work environment, leading to favourable innovation performance (Nadozie et al., 2019). Due to climate change and external challenges, companies employ a dynamic strategic framework of strategic choices, including perceiving competitive environmental signals, formulating strategic choices, hedging risks, exercising discretion in intangible markets, and reconfiguring knowledge and capabilities to gain competitive advantage (Wang et al., 2018). While CC can represent the dominant culture and foster the sharing of core values among organisational members, employees have varying perceptions of a competitive environment, resulting in different behavioural responses (Tran Huy, 2023).

2.11.2 Competitive Climate, Dynamic Capability and Performance

Research in the field of dynamic capabilities has largely overlooked boundary conditions, such as environmental conditions and organisational structure. Therefore,

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it is necessary to identify the most relevant contingency assumptions within the dynamic capabilities approach (Mikalef et al., 2019). Although some may anticipate that, on average, organisations with stronger dynamic capabilities outperform those with weaker dynamic capabilities, there is no guarantee that businesses truly realise the potential of dynamic capabilities to yield expected outcomes (Teece, 2018). This aligns with the viewpoint of Law et al. (2017) who found support for the argument that the development of dynamic capabilities does not necessarily lead to performance improvement; instead, the environment influences the outcomes of dynamic capabilities on performance. Wilden and Gudergan (2015) conclude that realising the potential of dynamic capabilities for performance depends on both internal and external factors. Hence, it is important to recognise that the value of dynamic capabilities is contingent on the environment. Similarly, contingency theory posits that job performance depends on the alignment between the organisation and the environment (external fit) as well as the alignment among organisational elements (internal fit) (Zhu et al., 2022). Furthermore, the dynamic capabilities framework also suggests that internal elements of organisations (strategy, resources, capabilities) only generate competitive advantages when organically combined with the external environment (Teece, 2018).

Past literature consistently argues that the environment moderates the relationship between dynamic capabilities and performance (Chen & Zheng, 2022; Ferreira et al., 2021; Mikalef et al., 2021; Norouzi et al., 2022). With regard to the impact of competitive environments on dynamic capabilities, scholars suggest that organisations may not need to employ dynamic capabilities if there is no competition (Samsudin & Ismail, 2019). In the face of low competitive intensity, organisations can use existing

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routines to achieve their objectives. However, this causes organisations to rely less on dynamic capabilities as they do not need to reconfigure their resource base to adapt externally (Wang et al., 2018; Yang,2020). Conversely, intensifying competitive environments may pose risks of losing resource advantages and declining performance (Ye et al., 2020). Thus, to cope with increasing competition, organisations may need to reconfigure their resource base to achieve differentiation through dynamic capability (Correia et al., 2021). Organisations should perceive new market trends ahead of major competitors and seize opportunities to acquire new resources or restructure existing resources and develop new capabilities to leverage market opportunities as articulated in the concept of first-mover advantage in DCT (Teece, 2015). In highly volatile environments characterised by rapidly changing opportunities and pervasive competition, turbulence reduces the competitive position and potential value of existing capabilities, necessitating frequent and complex organisational changes. In such contexts, dynamic capabilities play a crucial role (Mikalef et al.,2019; Dejardin et al.,2023). In highly competitive environments, resources are difficult to acquire (Lapersonne, 2013); therefore, the ability to effectively perceive and promptly make necessary adjustments, dynamically implementing changes in response to environmental shifts, becomes the only way for firms to achieve a series of short-term advantages (Kafetzopoulos, 2023).

Conversely, in less intense environments, resources are more easily obtainable. This allows firms to execute established strategies and flexibly allocate resources to adapt to environmental changes, thus enabling relatively weaker dynamic capabilities to drive the attainment of long-term competitive advantage (Liu et al., 2018). Moreover, CC fosters creativity and productivity, resulting in higher job quality. When

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individuals have the desire to win, they are more likely to explore a variety of solutions to any given problem. According to the person-environment fit perspective, an individual's personal characteristics and environmental factors interact to influence their dynamic capability in response to changing work environments (Bieńkowska & Tworek, 2020a; Edwards & Parry, 2018). Furthermore, prior research has demonstrated that CC moderates the relationship between job crafting and job performance (Wang et al., 2018). Additionally, as previously discussed, in China, characterised by its Eastern culture, competition contributes to employee performance (Yang, 2020). This study examines the ever-changing digital market, exploring the impact of EDC on EDP which requires considering the environment's moderating function. This is the existing research gap the study aims to address.

In summary, through a systematic literature review on OSV, mediating variables, and moderating variables in relation to EDP, this study provides a comprehensive analysis of each variable. The findings indicate significant variations in the impact of organizational support on EDP across different industries. Regarding mediating variables, most existing studies focus on employees' attitudes and behavioral factors. However, in digital markets, dynamic capabilities are rarely incorporated as mediating variables, let alone EDC within a research framework.

The key contributions of this study are threefold. First, it underscores the critical role of employees in leveraging digital technologies to achieve EDP in dynamically evolving markets (Shao et al., 2022). Second, it positions EDCs as a mediating variable between OSV and EDP, extending beyond traditional attitudinal and behavioral variables (Bieńkowska & Tworek, 2020). Lastly, grounded in China's

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unique cultural context, this study introduces CC as a moderating factor influencing the relationship between EDC and EDP (Wang et al., 2028; Yang, 2020). This literature review not only deepens the understanding of organizational influences on EDP but also highlights the critical role of organizational support in achieving EDP in the digital era. Furthermore, it emphasizes that in dynamic markets, organizations must rely on EDC and cultural environments to effectively enhance EDP.

2.12 Chapter Summary

Firstly, diverse definitions of SMEs exist worldwide based on factors such as the number of employees and turnover. In this study, SMEs are precisely defined accoring to the criteria set by China for SME classification (Jia et al., 2020). Secondly, a review of the RBT and DCT was conducted. It was argued that in rapidly changing markets, organisations relying solely on resources find it challenging to sustain a competitive advantage. However, by adhering to the resource-dynamic capabilities-performance framework and interacting with the external environment, a conducive environment is created to achieve sustained competitive advantage (Teece, 2018). This study, conducted in the specific cultural context of China, incorporates the competitive culture of the selected region as a control variable and introduces CC as a moderating variable into the research.

Firstly, a review of studies across various industries reveals a significant inconsistency in the findings regarding the direct relationship between independent variables (DL, HI-HRMP, DC, and OL) and employee performance. Secondly, while the theory of dynamic capabilities has been studied for many years, the concept of EDC, characterised by the features of DCT, was first introduced in 2020 (Bieńkowska &

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Tworek, 2020). Scholars have argued that in dynamic markets, EDC has a more significant impact on employee performance than employee attitudes and behavioural variables (Bieńkowska & Tworek, 2020, 2024; Wang, et al., 2024). However, current research on the impact of EDC on employee performance reveals two gaps. Firstly, although the effect of EDC on employee performance is particularly pronounced in dynamic markets, there has been no exploration of their impact on EDP within dynamic digital contexts. Secondly, a substantial body of literature, based on the RBT and DCT, has demonstrated the role of dynamic capabilities as a mediating variable between organisational support resources and performance (Lin, 2014; Prabowo et al., 2021; Seddon, 2014; Terziovski, 2010). Although EDC exhibits characteristics of both employee behaviour and dynamic capabilities (Bieńkowska & Tworek, 2020a; Phan et al., 2022),their role as a mediating variable between OSV and EDP remains an unaddressed gap in the research, particularly in the context of SMEs. Thirdly, previous studies have demonstrated that the environment can influence employee performance by moderating employees' work motivation (Wang et al., 2018). However, there are two research gaps in this area. Firstly, previous studies have not considered the cultural environment of specific regions. For instance, in China, which is influenced by Confucian thought, employees within organisations tend to engage in competition, and it has been demonstrated that competition is beneficial for performance outcomes (Jiao et al., 2013; Mikalef et al., 2021; Wilden & Gudergan, 2015). Secondly, there is still a gap in the impact of CC on EDP in digital markets, especially among Chinese SMEs.

In conclusion, the relationship between OSV (leadership styles, HRMP, OL, and DC) and employee performance has been extensively studied in the past, and the linkage between strategy, resources, dynamic capabilities, and performance through

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environmental variables has been established (Barney, 2001; Teece, 2018). However, there is limited empirical research investigating those processes associated with this alignment (Li&Wu, 2014). For instance, the value derived from existing digital performance sources (e.g., the value created using VRIN resources) may decrease due to decreased adaptability to the constantly changing market (e.g., whether SME resources, strategies, and capabilities to adapt to the development in digital technologies). This study constructs an analytical framework based on the RBT and DCT, incorporating strategy (DL), resources (DC, HI-HRMP, and OL), EDC, and CC. It clarifies management processes by addressing the ambiguity in DCT on strategic management. Hence, based on the literature review, this study constructs the research framework in the following chapter.

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CHAPTER 3

RESEARCH FRAMEWORK AND HYPOTHESIS DEVELOPMENT

3.1 Introduction

This chapter introduces the theoretical framework, conceptual framework, and hypothesis development related to OSV (DL, DC, HI-HRMP, and OL), EDC, CC, and EDP.

3.2 Hypotheses Development

3.2.1 Digital Leadership (DL) and Employee Digital Performance (EDP)

Digital transformation leads to work transformation (Nagel, 2020), and digital transformation shapes the way people work, think, and interact (Hai et al., 2021). In the digital age, the pervasiveness of digital technology in organisations has led to the emergence of DL, which is essential for integrating SME strategies with digital advances. Most SMEs are affected by the digital revolution, stressing the importance of DL. In a fast-changing market, SMEs need DL to quickly implement digital technology business strategies (Li et al., 2022). Previous research has demonstrated that DL has direct or indirect effects on employee performance across various industries and contexts. For example, several empirical studies require the inclusion of mediating variables. DL does not directly affect employee performance, but it directly affects employee innovation, and innovation has a direct positive effect on employee performance in the field of the electronic information industry (Muniroh et al., 2022). In a digital environment, task-oriented and relationship-oriented leadership behaviours influence job performance through the mediating factors of individual job

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autonomy and team cohesion as seen through a survey conducted on German service companies employees (Bartsch et al., 2020). In another study, DL was found to directly and indirectly affect employee performance with work motivation as a mediator (Mohamed, 2022). DL significantly enhances employee performance by driving digital transformation, which serves as a crucial mediator amplifying the positive effects of leadership, as demonstrated through investigations across multiple industries (Qiao et al., 2024). During the pandemic, a study was conducted on data collected from 487 employees of SMEs in India. The findings underscore the mediating role of empowerment in the relationship between DL and employee performance (Lathabhavan & Kuppusamy, 2024). Furthermore, research indicates that DL influences employee performance only when personal creativity acts as a mediator (Öngel et al., 2023).

Moreover, there are also empirical research findings that do not require mediating variables. For instance, Turyadi et al. (2023) employed a literature review approach to demonstrate the positive impact of DL on employee performance. This positive influence has been further validated through a quantitative analysis of Indonesia's education sector (Riski & Rino, 2024). Additionally, a survey conducted on 36 corporate teams and 328 employees in China revealed that DL has a significant effect on employee performance (Liao et al., 2024).

The above review highlights the inconsistent findings regarding the impact of DL and leadership styles on employee performance in various industries. Some studies also suggest the need for mediating variables. The discussion presented above reveals the distinctions between employee performance and EDP, which has resulted in a gap in

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the current research. Given the focus on Chinese SMEs in this study, further validation of its effectiveness is required. Accordingly, the following hypothesis is proposed:

Ha1: There is a positive relationship between DL and EDP in Chinese SMEs.

3.2.2 Digital Capability (DC) and Employee Digital Performance (EDP)

Organisational or employee performance is largely dependent on its HRMP, and achieving employee performance is a prerequisite for realising organisational performance (Nyathi & Kekwaletswe, 2023). Previous research indicates that some studies require the use of mediating variables. For example, DC has an indirect and positive impact on employee performance, with digital innovation mediating the influence of DC on employee performance (Nasiri et al., 2020). DC has a positive impact on employee performance, with employee learning serving as a mediator, according to a survey of full-time employees in Chinese companies(Fu et al., 2023). Data from the World Bank's 2022 Enterprise Survey, encompassing 999 companies from 27 countries, indicate that DC positively impacts employee performance only through technological capabilities (Heredia et al., 2022). Works of literature suggest multiple results on DC and business performance, with some studies suggesting a positive relationship (Cahanar & Hamsal, 2021). For example, DC positively influences digital innovation and affects firm performance in SMEs (Khin & Ho, 2019). DC affects employee performance with employee motivation as mediators (Kurniasih et al.,2022). DC is mediated by value co-creation, and the collaborative creation of value between the company and external stakeholders influences performance outcomes (Wang et al., 2022). Psychological empowerment partially mediates the relationship between DC and employees' task performance (Ochoa Pacheco & Coello-Montecel, 2023). Surveys conducted on 433 full-time Chinese

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employees revealed that learning and unlearning mediate the relationship between DC and employee performance (Fu et al., 2023).

Despite all the studies stated above, some scholars found that relying on mediating variables between DC and performance is unnecessary. For example, among Vietnamese SMEs, research shows that DC has a significant impact on performance, and innovative capabilities moderate the relationship between them (Bui & Le, 2023). DC directly affects SME performance, and the heterogeneity of corporate knowledge affects DC, while internal knowledge conversion improves corporate performance. According to Liu et al. (2023), external knowledge transformation promotes internal knowledge transformation. Another study in Saudi Arabia found that DC directly affects supply chain innovation performance (Abourokbah et al., 2023), and innovative DC positively affects employee performance (Adnan et al., 2022; Herwina, 2022). However, some research suggests that DC has a minimal or no impact on innovation performance (Usai et al., 2021). Hence, digital innovation can moderate the influence of DC on performance (Wang et al., 2022).

The empirical research mentioned above demonstrates that DC has a direct or indirect effect on employee performance. Nevertheless, the link between these variables varies greatly between industries. Since this study focuses on Chinese SMEs and examines the influence of DC on EDP, further evidence is required. Considering this, this study put forward the following hypothesis:

Ha2: There is a positive relationship between DC and EDP in Chinese SMEs.

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3.2.3 High-Involvement Human Resource Management Practices (HI-HRMP) and Employee Digital Performance (EDP)

Organisational or employee performance is largely dependent on its HRMP, and achieving employee performance is a prerequisite for realising organisational performance (Nyathi & Kekwaletswe, 2023). Xu et al. (2023) claim that if organisations implement flexible HRMP, employee performance will be enhanced. Therefore, efforts must be directed towards improving human resource capabilities to enhance employee performance as performance is the outcome or output of the process (Elisa et al., 2022). Past empirical research shows that developmental HRMP directly affects employee performance in the Belgium cross-sectoral study (Marescaux et al., 2019). HRMP also positively influences employee performance in state-owned enterprises in Indonesia (Susananto & Arief, 2021). HRMP and technology are complementary resources in achieving employee performance outcomes (Stirpe et al., 2022), and employee creativity mediates the relationship between high-performance work practices (HPWP) and employee performance, as evidenced by a survey conducted among SMEs in Malaysia (Ismail et al., 2021). Employee work motivation mediates the relationship between digital HRMP and employee performance, as demonstrated by a survey involving employees in Jordan's industrial sector (Al-kharabsheh et al., 2023). Flexible HRMP significantly and positively influences employee innovative performance, with employability acting as a mediator from a survey involving internal employees in Chinese enterprises (Xu et al., 2023).

Studies show that HI-HRMP was developed from HRMP and hence, possesses the HRMP function (Rubel et al., 2017). HI-HRMP allows organisations to build "organisation-specific human capital, which in turn affects organisational

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performance in two ways: directly through its impact on employee performance, and indirectly through employees' attachment to the company" (Yasir & Majid, 2020). Effective HI-HRMP enhances the performance of service organisations by increasing employees' trust in technology adaptation (Rubel et al., 2023). HI-HRMP has also significantly enhanced employee performance in the banking industry of the Philippines (Cruz & Calaluna, 2022).A survey of Chinese manufacturing employees indicates that HI-HRMP significantly influences organisational performance (Gu et al., 2023). A similar result was also seen in Ethiopian industrial companies. Employee performance was positively impacted by HI-HRMP (Siraj et al., 2022). Research also shows that HRMP, mediated by job satisfaction and employee engagement as the moderating variable, influences employee performance in the Jordanian banking industry (Alsafadi & Altahat, 2021).In contrast, Cahyadi et al. (2022) demonstrate that HI-HRMP cannot directly influence individual employee performance, as evidenced by a survey involving Indonesian SMEs operating in Lublin.

HI-HRMP has a positive impact on innovative behaviour and emotional commitment, and autonomy plays a crucial role in moderating this relationship (Renkema et al., 2021). Job satisfaction plays a mediating role in the relationship between HRMP and employee performance (Keltu, 2024). In the digital era, organisations require all employees to work with high enthusiasm, productivity, and task performance. This is a crucial aspect of achieving individual employee performance, and leadership styles and HI-HRMP plays a role in meeting these demands (Cahyadi et al., 2022; Leroy et al., 2018; Marescaux et al.,2019; He et al., 2021).The review reveals that although HI-HRMP performs the functions of HRMP, its impact on employee performance varies significantly across different industries. Furthermore, the distinction between

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employee performance and EDP contributes to the existing research gap in the current studies. Thus, this study proposes the following hypothesis:

Ha3: There is a positive relationship between HI-HRMP and EDP in SMEs.

3.2.4 Organisational Learning (OL) and Employee Digital Performance (EDP)

OL is a key driver of organisational innovation, significantly influencing employee performance in various industries. The mediation of organisational innovation has improved employee performance in the petroleum industry (Imani et al., 2020). Evidence has also proven OL influences on employee performance through innovation in state-owned enterprises within the telecommunications industry in Indonesia (Muniroh et al., 2022). Similarly, data collected from online surveys involving Korean organisations indicate that OL contributes to organisational performance (Mollah et al., 2023). Empirical research involving employees of CIMB Niaga Bank also shows a significant impact of OL on the performance of all its employees (Putra & Ruslan, 2021). A survey conducted on various Information Technology (IT) companies in India validated that employee performance is primarily based on OL (Meher & Mishra, 2022). Findings from another survey involving 261 individuals from the Indonesia Islamic University also indicate that OL has a significant impact on employee performance (Santoso et al.,2021).

Research has also provided evidence that OL affects employee performance through mediating variables. According to a survey of palm oil companies in West Kalimantan, OL impacts employee performance only when mediated by job satisfaction and organisational commitment (Hendri, 2019). Digital organisational culture mediates

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the relationship between OL and organisational performance, as evidenced by a survey conducted in the Malaysian petroleum industry (Hadi & Baskaran, 2021). OL can also indirectly and directly impact employee performance through the mediation of innovation in the construction industry in Iran (Chan et al., 2023), and in Indonesia, job satisfaction acts as a mediator between OL and employee performance at PT Techno Motor Indonesia (Gunawan et al., 2022).

Therefore, based on the results of empirical research, there are significant variations in the impact of OL on employee performance and organisational performance across different industries. However, in exploring SMEs in specific regions, it is necessary to further analyse and demonstrate its influence on EDP.

Ha4: There is a positive relationship between OL and EDP in Chinese SMEs.

3.2.5 Digital Leadership (DL) and Employee Dynamic Capability (EDC)

The market turbulence in the digital era, also referred to as VUCA (Volatility, Uncertainty, Complexity, and Ambiguity) signifies the transformation of businesses (Troise et al., 2022). This transformation requires digital leaders to perceive opportunities, seize them through strategic design, foster implementation and innovation, and undergo organisational change to embrace new capability paradigms (Le & Do, 2024). Digital leaders must possess digital literacy and knowledge, vision, ability to design customer-centric strategies, agility (the ability to adapt to changing market conditions), willingness to take risks (creating an environment for experimentation), and the ability to collaborate (Promsri, 2019).

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DL, a new term coined in the digital era, is dynamic and central to driving digital transformation (Oberer & Erkollar, 2018). Thus, digital leaders must have a reactionary approach that can quickly adjust to these changes since the digital environment is changing very rapidly (Bowen, 2021). Agile work environments are promoted by digital leaders because they foster quick innovation that boost the satisfaction of clients and staff (Bolte, 2018). DL is considered particularly crucial for creating, reconfiguring, and deploying organisational resources due to the influence of their positions and roles on the behaviour of other leaders within the company, enabling them to control decisions related to resource allocation and strategic direction (Khaw et al., 2022).

Specifically, the dynamic management capabilities of a Chief Executive Officer (CEO) empower the company to effectively identify external market opportunities that are aligned with organisational resources. A CEO can then reconfigure and deploy these resources to pursue market opportunities, inspiring employees to dynamically adjust resources in support of strategic change initiatives (Samimi et al., 2022), particularly since DL has a robust direct and indirect relationship with dynamic capabilities. However, the path of dynamic capabilities development depends on the evolution of innovation capabilities driven by market-oriented DL (Mihardjo & Rukmana, 2019; Sasmoko et al., 2019). Empirical research shows that DL strategies that align with market orientation enhance dynamic capability-based innovation. DL helps identify market shifts, seize opportunities, and restructure a firm (Mihardjo, et al., 2019). Therefore, DL has a significant impact on dynamic capability (Mihardjo et al., 2019; Mihardjo & Rukmana, 2019). DL has always guided companies to adapt to changing times, connect people to open work ecosystems, balance human and technological

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engagement in work, innovate and think holistically (Asri, 2020), promote sharing using digital resources (Anwar & Saraih, 2024), and communicate openly and on time (Asri, 2020; Abu, 2020). Digital leaders will strive to engage their employees in the process of digital transformation. In rapidly changing market conditions, digital leaders must strive to engage employees in the digital transformation process (Sasmoko et al., 2019). This is crucial because organisations often need to frequently adjust their development strategies under such conditions, which can affect employee motivation and lead to confusion about directives from superiors. Therefore, digital leaders need to implement timely response strategies (Lubis et al., 2020).

The study indicates that DL has a direct and indirect significant effect on the development of strategic alliances and market-oriented dynamic capabilities (Mihardjo et al., 2019). It also has a direct influence on dynamic capabilities (Schoemaker et al., 2018). Leaders with data analysis capabilities contribute to the development of process-oriented dynamic capabilities when implementing big data analytics in the company in the digital era (Wamba et al., 2017). EDC, stemming from DCT, embodies the ability of employees to proactively address issues within the organisation (Bieńkowska & Tworek, 2020). Similarly, this study assumes a significant relationship between DL and EDC. Therefore, the following hypothesis is formulated:

Hb1: There is a positive relationship between DL and EDC in Chinese SMEs.

3.2.6 Digital Capability (DC) and Employee Dynamic Capability (EDC)

DC is an organisation's ability to execute strategic goals and gain a competitive edge in the digital age using digital technologies, tools, and resources, which includes

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digital skills, knowledge, infrastructure, and processes (Chen & Zheng, 2022). However, capabilities alone cannot sustain competitive advantage, which requires dynamic market reconfiguration and internal operating capabilities (Mikalef & Pateli, 2017). The argument for the relationship between DC and dynamic capability lies in the notion that digital technologies and tools can significantly influence and enhance dynamic capabilities and agility in work (Mao et al., 2024). Moreover, the study also illustrates that the capacity to attain organisational agility through IT-supported dynamic capabilities may be actualised in diverse circumstances, spanning from relatively stable settings to extremely unpredictable environment (Mikalef & Pateli, 2017). EDC refers to the ability of individuals within an organisation to adapt, learn, and respond to changing environments and demands. It involves their capacity to acquire new knowledge, develop new skills, and apply them effectively in dynamic and uncertain contexts (Bieńkowska et al., 2021; Bieńkowska & Tworek, 2020).

DC exhibits various characteristics. These include a flexible digital infrastructure and digital-related human capital (Xie & Wu, 2024), as well as the use of digital tools to optimise and enhance process efficiency (Zhen et al., 2021). Moreover, although DC is associated with digital technologies, it extends beyond technical skills. It also encompasses the ability of human resources to collaborate and innovate using digital technologies (Nasiri et al., 2020). At the same time, DC involves the ability to perceive, seize, and transform digital opportunities, thus facilitating digital transformation (Khin & Ho, 2019). Therefore, DC significantly influences EDC. However, the effectiveness of the relationship between them has rarely been demonstrated in current research. Therefore, this study assumes that DC positively influences EDC in Chinses SMEs.

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Hb2: There is a positive relationship between DC and EDC in Chinese SMEs.

3.2.7 High-Involvement Human Resource Management Practices (HI-HRMP) and Employee Dynamic Capability (EDC)

Studies show that HI-HRMP was developed from HRMP and hence possesses the HRMP function (Rubel et al., 2017). Research indicates that the implementation of a series of HRMP, such as employee training, job design, and fair rewards, positively impacts dynamic capabilities, including knowledge shaping, network social linkage, and resource allocation abilities (Apascaritei & Elvira, 2022). Research also shows that human resource-related quality management practices, such as learning-oriented practices, knowledge integration practices, strategic flexibility practices, and empowerment and teamwork practices, significantly enhance an organisation's dynamic capabilities (Gutierrez-Gutierrez et al., 2018).Additionally, HRMP can develop dynamic capabilities by continuously sensing opportunities and threats, seizing market options, and reallocating resources and capabilities (Abbas, 2024).

During periods of market volatility, especially when developing HRM strategies like recruiting and selection, it is crucial to give specific consideration to EDC (Bieńkowska & Tworek, 2020). It has been suggested that HRMP contributes to EDC; however, there is no empirical validation (Bieńkowska et al., 2021; Bieńkowska & Tworek, 2020; Tworek et al., 2023). In their study, Al Wali et al. (2023) noted that HRMP has a vital function in detecting individuals with elevated levels of EDC using psychological assessments throughout the recruitment process in public hospitals. Also, research conducted in the Chinese information technology industry indicates that the presence of HI-HRP enhances employees' inclination towards proactiveness

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in their work (Alikaj et al., 2021). Indeed, HI-HRMP influences the development of EDC, although, at this point, EDC has not been studied as a separate topic. Thus, to fill the gap in the diversity of this research, the present review formulates the following hypothesis:

Hb3: There is a positive relationship between HI-HRMP and EDC in SMEs.

3.2.8 Organisational Learning (OL) and Employee Dynamic Capability (EDC)

The essence of dynamic capabilities, as a high-order capability, is the behaviour-oriented improvement, renewal, restructuring, and recreation of human resource capabilities (Spanó et al., 2024). Organisations respond to industry volatility, increase innovation in uncertainty, and address knowledge communication challenges in the VUCA environment through learning (Cousins, 2021). As an advanced capability, the essence of dynamic capabilities is the behaviour-oriented improvement, renewal, reconstruction, and recreation of resource capabilities (Balaton, 2023). Due to the accelerated pace of digital transformation, the skills and knowledge required for employees to complete their work quickly become outdated. The continuously changing business environment increases the instability of employment (Pulsiri & Vatananan-Thesenvitz, 2018). Therefore, organisations place greater emphasis on employee learning, as learning enhances the organisation's competitiveness and dynamic capabilities by developing employees' skills (Pulsiri & Vatananan-Thesenvitz, 2018). Moreover, global competition and the emergence of new forms of innovation in manufacturing indicate that merely possessing unique knowledge is not enough to ensure the competitiveness of a company, so dynamic capabilities are the source of sustainable competitive advantage (Asija & Ringov, 2021). Dynamic

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capability and OL are closely connected areas of study, as dynamic capability is fundamentally dependent on the ability to learn (Priyono & Hidayat, 2024), namely, utilising existing capabilities to explore new ones. Moreover, OL has the potential to alter resources, routines, and capabilities, thereby reconfiguring dynamic capabilities (Ferreira et al., 2021). Without OL, the occurrence of dynamic capabilities and strategic foresight in leadership would be implausible as OL is the process of generating new information and knowledge and integrating it into the organisation (Pulsiri & Vatananan-Thesenvitz, 2018). Dynamic capabilities regard learning as a key mechanism. Learning can be viewed as the acquisition of information, knowledge, or skills through study, research, experience, or training (Liu et al., 2018).

Recent studies indicate that OL can develop higher-order intangible supply chain capabilities (Cadden et al., 2022). In Iran, Farzaneh et al. (2021) conducted a study that revealed a favourable correlation between OL and the development of dynamic capacities, including learning, integration, and reconfiguration. Additionally, OL is a key factor in altering and restructuring the operational capabilities of the human resources services industry (Chen & Zheng, 2022). Abundant empirical studies indicate that by enhancing the sharing and utilisation of employees' internal learning capabilities, organisations can improve their resource reconfiguration and rapid responsiveness (Santoro et al., 2021). Yuan et al. (2021) presented empirical results based on 493 Chinese enterprises, indicating that ambidextrous learning has a positive impact on dynamic capabilities. Moreover, OL exerts a direct or indirect influence on dynamic capabilities (sensing, seizing, and reconfiguring) through transactional or transformational leadership, as evidenced by a survey conducted among 106 companies (Bornay-Barrachina et al., 2023).

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The technological and market environments were found to moderate this relationship, highlighting that OL and dynamic capabilities enhance employee competitiveness (Chen & Zheng, 2022). Similarly, we posit that OL can positively influence EDC in Chinese SMEs. To this end, the following hypothesis is formulated:

Hb4: There is a positive relationship between OL and EDC in Chinese SMEs.

3.2.9 EDC as a Mediator between OSV and EDP

According to the RBT and DCT, resource is considered a vital prerequisite for dynamic capabilities (Schilke et al., 2018), and dynamic capabilities serve as a crucial intermediary between resources and performance (Lin&Wu, 2014; Mikalef et al., 2019). Employee performance hinges on achieving both tangible and intangible objectives of an organisation, with this alignment being most closely related to dynamic capabilities (Schilke et al., 2018). Extensive evidence has proven the beneficial influence of dynamic capabilities on employee performance (Chen & Zheng, 2022; Ferreira et al., 2021; Jiao et al., 2013; Khan et al., 2021). This may be because dynamic capabilities is a crucial element in enhancing competitive advantage by leveraging resources with VRIN characteristics (Seddon, 2014; Teece, 2018). Research indicates that dynamic capabilities mediate the relationship between resources (VRIN) and performance (Canhoto et al., 2021) as the capability to integrate resources is the foundation of an organisation's efforts to achieve a more advantageous competitive position (Canhoto et al., 2021; Rupeika-Apoga, Petrovska, et al., 2022; Troise et al., 2022). However, the RBT does not provide detailed explanations on why and how some enterprises gain a competitive advantage in unpredictable and rapidly changing environments (Ristyawan et al., 2023;Seddon,2014).

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The absence of dynamic capability may cause enterprises engaged in digital development to lose their competitive edge as technological advancements are inherently dynamic (Mikalef & Pateli, 2017). Empirical research in high-speed markets demonstrates that organisational flexibility can achieve sustained competitive advantages when mediated by dynamic capability (Mikalef & Pateli, 2017).In the digital era, digital leaders can cultivate an environment that enhances the development of dynamic capabilities (Mihardjo, Sasmoko, Alamsjah, et al., 2019). By promoting a culture of continuous learning and experimentation, digital leaders can encourage employees to adapt to technological changes, generate innovative ideas, and effectively address digital challenges (Mihardjo et al.,2019). Therefore, dynamic capabilities serve as a mechanism through which digital leadership positively influences job performance (Mihardjo et al., 2019). Leadership has a significantly positive impact on the work motivation of middle-level managers in the study. Work motivation also has a notably positive effect on job performance (Nguyen et al., 2021). In short, dynamic capabilities mediate the relationship between top management and job performance (Acosta-Prado & Tafur-Mendoza, 2024).

The RBT supports the pivotal role of organisational resources (tangible and intangible) in supporting employee performance and emphasises the importance of HI-HRMP to achieve innovative outcomes (Yasir & Majid, 2020). Research indicates that HRMP related to digital transformation significantly enhances digital performance through the dynamic capabilities associated with big data analytics (Wamba et al., 2017). Based on data collected from 206 Chinese manufacturers, it was found that HI-HRMP plays the most significant role in enhancing dynamic capabilities, which in turn contributes to improved internal organisational performance (Gu et al., 2023).

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The development of dynamic capabilities through HI-HRMP results in enhanced digital performance outcomes (Li et al., 2023). HI-HRMP also gives staff the freedom and resources to develop new digital solutions. Innovation-capable employees can use HI-HRMP to create and implement unique digital solutions; thus, improving employee performance (Ha et al., 2023). In addition, HI-HRMP helps employees adapt to workplace changes, thereby improving organisational performance and giving a competitive edge (Delery & Roumpi, 2017b). Employee innovative behaviour mediates the relationship between HI-HRMP and technological innovation performance. The findings of this study contribute to an understanding of how organisations in similar contexts can enhance their technological innovation performance by investing in HI-HRMP. HI-HRMP is found to stimulate employees' technological adaptation and innovation (Rubel et al., 2023), and it is a key mechanism for cultivating flexible employees capable of performing diverse tasks in unpredictable environments (Yasir & Majid, 2020).

In addition, DC is an organisation's ability to use digital technology, tools, and processes to achieve strategic goals (Fu et al., 2023). Dynamic capability is the key factor that determines how individuals efficiently employ their digital skills to improve job performance in SMEs (Cannas, 2021). Adaptability, as a form of DC, empowers individuals to efficiently react and adjust to digital transformation, difficulties, and possibilities. Having great adaptability to technology is crucial for employees to effectively exploit the DC, which in turn improves job performance (Yeow et al., 2018). DCs provide tools, platforms, and data for innovation, and dynamic capability fosters innovative digital solutions (Carcary et al., 2016). Dynamic capabilities empower employees to proficiently analyse and resolve intricate digital

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obstacles as DC furnishes the essential tools to detect and tackle digital problems (Warner, 2019). Moreover, businesses need to adjust their capabilities through dynamic capabilities to integrate innovation performance, considering the impact on existing asset knowledge (Su et al., 2023). Thus, dynamic capability strengthens the correlation between DCs and job performance.

Furthermore, improving corporate organisational performance requires strong dynamic capabilities in addition to a deep degree of OL. Nevertheless, dynamic capacities must function as a mediator between OL and performance (Ferreira et al., 2020). An analysis of the relationship between OL and dynamic capabilities and employee performance in human resource service firms found that OL improves resource integration and reconfiguration capabilities, which in turn improves employee performance (Ghasemzadeh et al., 2022).

In 2020, the concept of EDC, derived from DCT, emerged (Bieńkowska & Tworek, 2020). Similar to the DCT, EDC refers to the ability of employees to sense, seize, and transform risks in response to changes in a dynamic market environment. This capability significantly impacts employee performance compared to attitude and behaviour variables (Bieńkowska & Tworek, 2020). In turbulent market environments, HRM solutions such as OL must prioritise EDC's impact on job performance (Bieńkowska et al., 2021; Bieńkowska & Tworek, 2020). In fast-paced markets characterised by digitalisation, selecting and recruiting employees with digital skills can significantly improve organisations' dynamic capabilities, thereby enhancing employee performance (Proksch et al., 2021). Al Wali et al. (2023) also noted in their

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study that HRMPs are essential in identifying individuals with elevated levels of EDC through recruitment using psychological tests in public hospitals.

Similarly, this research considers that organisation support factors (DL, DC, HI-HRMP, and OL) positively affect EDC which enhances their digital performance in the digital era. The study establishes the following hypothesis:

Hc1: EDC as a mediating variable positively affects the relationship between DL and EDP in Chinese SMEs.

Hc2: EDC as a mediating variable positively affects the relationship between DC and EDP in Chinese SMEs.

Hc3: EDC as a mediating variable positively affects the relationship between HI-HRMP and EDP Chinese in SMEs.

Hc4: EDC as a mediating variable positively affects the relationship between OL and EDP in Chinese SMEs.

3.2.10 Employee Dynamic Capability (EDC) and Employee Digital Performance (EDP)

According to the RBT, dynamic capability is a crucial organisational resource that aids in achieving objectives and ultimately attains competitive advantages (Kero & Bogale, 2023). Dynamic capability significantly influences employee performance, especially when employees operate in dynamic, rapidly changing, and high-pressure environments where they must always perform their duties effectively. Employee performance is a key determinant of overall organisational performance (Makkonen et al., 2014). Abdullah et al. (2020) emphasise the need to underscore the mechanism through which dynamic capability affects employee job performance to accurately reveal its value to contemporary organisations. Research shows that dynamic

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capability, acting as a mediating role, affects job performance through innovative work behaviours and becomes a fundamental source for organisations to gain a competitive advantage (Wali et al., 2020). In 2023, Al Wali et al. (2023) further demonstrated that EDC is a critical determinant of innovative work behaviours, and innovative work behaviours play a key mediating role in the relationship between EDC and job performance. Wali et al. (2020) validated the impact of dynamic capability on job performance, indicating its key role in achieving organisational sustainability. Empirical research has shown that EDC has a positive impact on employee innovative work behaviours and employee performance (Phan et al., 2022).

Therefore, dynamic capability not only has a significant impact on job performance (Lin & Wu, 2014; Makkonen et al., 2014; Wamba et al., 2017), it also enhances an organisation's sustainable competitive advantage and highlights the crucial role of dynamic capability in dynamic markets (Ledesma-Chaves et al., 2020; Lin, 2014; Rodríguez-Serrano & Martín-Armario, 2019b). Moreover, EDC is a variable in the evolution of DCT, and empirical evidence has confirmed the relationship between EDC and job performance through mediating and moderating variables. Recently, scholars tested the impact of EDC on job performance (Towrek et al., 2023; Bienkowska & Tworek, 2020; Bieńkowska et al., 2020). However, as this study is grounded in the specific context of Chinese SMEs, further validation is needed to ascertain whether dynamic capability can influence EDP in dynamic digital markets. To address this, the following hypothesis is established:

Hd1: There is a significant relationship between EDC and EDP that significantly influences the Chinese SMEs.

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3.2.11 Competitive Climate (CC) as a Moderator between EDC and EDP

The impact of different antecedents on employee performance appears to be a contingent CC, as evidenced by significant variations in empirical findings across different studies (Rubera & Kirca, 2012). In the case of a stable market with high predictability, firms face minimal immediate risks. However, when environmental conditions change, uncertainty arises, posing risks to firms (Kafetzopoulos, 2022). While the moderating role of the environment has been a central focus in SMEs literature, several studies examining SME performance have also considered references to internal and external boundary conditions (Hernández-Linares et al., 2021). DCT involves integrating, building, and reconfiguring internal and external resources to respond to environmental changes (Teece et al., 1997). Recognising and responding to opportunities arising from environmental changes enable firms to achieve and sustain high performance (Dayioglu et al., 2024). In the field of strategic management, strategic alignment of resources and capabilities with the environment has consistently been a critical concern (Rashid et al., 2024).The study indicates that cultural environment may moderate the relationship between dynamic capability and firm performance (Khaksar et al., 2020). In situations with high environmental dynamism, each of these capabilities has a greater impact on the performance of new enterprises. Dynamic capability is more effective in the implementation of organisational change in highly dynamic environments (Jiao et al., 2013). In addition, external environmental factors moderate dynamic capability and competitive performance driven by digital technology as shown by a survey conducted on 1500 companies from the ICAP 2015 corporate directory selected randomly (Mikalef et al., 2021). The technological and market environments exert a positive moderating influence on the relationship between dynamic capability and organisational

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performance in human resources service enterprises (Chen & Zheng, 2022). In Kenyan food and beverage industries, for example, the relationship between dynamic capability and performance is moderated by organisational flexibility (Rono et al., 2021). Entrepreneurial orientation also positively moderates dynamic capability and firm performance (Ferreira et al., 2021).

Thus, it can be summarised that scholars have conducted studies on the moderating variables of dynamic capability and firm performance, where the moderating variables can be classified according to several characteristics such as cultural background, personality traits, environment, technology, etc. For instance, Bitencourt et al. (2020), through a meta-analysis, found that economic and cultural contexts have a dynamic impact on the vitality of organisational development. Furthermore, they discovered that both economic and cultural factors play a moderating role in the relationship between dynamic capability and employee performance. The relationship between dynamic capability and business performance was investigated, along with the moderating influences of individualism, power distance, economic development levels, and Eastern and Western cultural backgrounds (Yang, 2020). Surprisingly, in this context, it was found that the Eastern orientation, which is marked by low levels of individualism and large power distance, had a greater impact on the relationship between dynamic capability and firm performance than the Western orientation (Yang, 2020). Strong power distance and low individuality positively moderate the link between dynamic capability and firm performance (Bitencourt et al., 2020). In the Indonesian pharmaceutical industry, IT adoption positively moderates the relationship between dynamic capability and firm performance (Dalle et al., 2020). The

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relationship between digital dynamic capabilities and digital transformation performance is moderated by digital innovation orientation (Shen et al., 2022).

In terms of a competitive environment, competition among individuals permeates their lives as they strive for limited resources, services, and status. In a low CC, only seizing actions appear to impact performance, whereas, in a high CC, both reconfiguration and seizing actions together appear to enhance firm performance (Wang et al.,2018). Specifically, the intensity of CC influences the effect of dynamic capability on performance (Markovich et al., 2021). Research shows that CC moderates self-monitoring and employee performance (Quratulain et al., 2021). Recent evidence suggests competitiveness at the micro-level and its association with performance is significant (Baumann et al., 2016; Swab & Johnson, 2019). However, research on the correlation between competitive environment, dynamic capabilities, and performance at the individual level still requires further substantiation (Baumann & Harvey, 2021; Buitrago et al., 2021). Moreover, investigating how CC moderates EDC and job performance across different countries and regions in rapidly changing markets would be beneficial and address the current research gap (Yang, 2020). Past studies suggest that dynamic capability enhances performance, but it must be supported by the organisation's internal and external working environments (Drnevich & Kriauciunas, 2011; Mikalef et al., 2021). In a stable environment, the role of dynamic capability is limited; however, in dynamically changing environments, dynamic capability has a particularly significant impact on organisational performance and job performance (Eisenhardt & Martin, 2000; Teece, 2018).This study was conducted to examine SMEs' digital markets in a specific Chinese cultural region as further research and

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demonstration are needed on EDC and EDP. The study assumes the following relationships:

Hd2: CC has a positive moderation effect between employee dynamic capability and employee digital performance in Chinese SMEs.

3.3 Research Framework

3.3.1 Theoretical Framework

The essential prerequisites for SMEs to sustain a competitive advantage in a fast-evolving digital market are unique with irreplaceable resources and adaptable capabilities (Das et al., 2020; Prabowo et al., 2021). As the RBT collapses in high-speed markets, the strategic challenge is to maintain a competitive advantage although the duration of competitive advantage is inherently unpredictable (Teece et al., 1997). Therefore, sustainable competitive advantage resides in the resource configuration built by managers using dynamic capabilities, rather than the capabilities themselves (Salvato & Vassolo, 2018). To illustrate how SMEs use digital technology to improve their performance by enhancing their economic and social value, this study draws on the RBT (Barney et al., 2001; Seddon, 2014; Terziovski, 2010) and DCT (Eisenhardt & Martin, 2000; Teece, 2018; Teece et al., 1997; Mwange et al., 2025). According to the RBT, the most important resources are valuable, rare, inimitable, and non-substitutable (VRIN). VRIN resources can maintain competitiveness (Seddon, 2014; Terziovski, 2010), and they constitute a crucial component of any competitive advantage theory. Among VRIN assets, the most significant category is intangible assets, also referred to as intellectual capital (Teece, 2000). Most intangible assets are unclearly owned, hard to get, and hard to negotiate (Teece, 2015). Specifically, the theory indicates that resources should include both tangible and intangible assets

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(Seddon,2014). The extensive use of intangible resources creates value in these economic situations (Teece, 2015). When compared to physical assets, intangible resources may naturally possess greater worth (Wales et al., 2023).

Without robust dynamic capability, VRIN resources, strategy, and advantage may be difficult to sustain (Teece, 2015;2018; Mwange et al., 2025). In other words, DCT was developed as an extension of the RBT (Pulsiri & Vatananan-Thesenvitz, 2018; Teece et al., 1997) to gain a sustainable competitive advantage. SMEs need to implement a strategy that cannot be easily replicated by competitors (Barney, 2001). As such, SMEs require capabilities and resources that possess the qualities of being valuable, rare, inimitable, and non-substitutable (VRIN) (Grant, 1991; Li et al., 2016; Porter, 1991).Modern organisations should view employees as available resources and develop mechanisms to foster new competencies that are necessary for employees to achieve sustainable competitive advantage in their given positions (Fonseca et al., 2019; Law et al., 2017). Empirical research shows that dynamic capability improves performance based on the RBT, and dynamic capability mediates the relationship between the RBT and the performance of SMEs (Li&Wu, 2014; Matarazzo et al., 2021; Scheuer & Thaler, 2022; Rodrigues et al., 2021).

In 2020, the COVID-19 pandemic caused a profound crisis in the business landscape, compelling companies to undergo a transformative shift towards digital operations for survival and optimal performance (Verhoef et al., 2021).However, SMEs operate within a digital environment characterised by VUCA, making digital transformation a challenge for them, even if support is provided (Troise et al., 2022). Hence, decision-makers had to adopt revised approaches and engage in a comprehensive re-

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examination of management models to adapt to the impact of digital transformation on organisational management and operation (Zhang et al., 2022a). Utilising dynamic capability to explore digital adjustments can provide a highly valuable perspective as dynamic capability enables the integration of digital technologies with organisational resources and capabilities; thus, facilitating the analysis of changes in organisational behaviour and resource allocation (Arndt & Pierce, 2018). Given the financial and human resource constraints of SMEs, reallocating internal organisational resources and DC may be an appropriate approach for their digital integration (Canhoto et al., 2021).

Bieńkowska and Tworek (2020) proposed the Job Performance Model as a potential solution that highlights the significance of EDC in influencing job performance in a dynamic market (Bieńkowska & Tworek, 2020). The concept of EDC is based on the DCT. EDC refers to the process of integrating, establishing, and reconfiguring the skills of employees to effectively respond to fast-changing market conditions, which directly affects job performance (Bieńkowska & Tworek, 2020). EDC consists of several dimensions:

1) Recognising shifting environmental conditions and evaluating potential possibilities and dangers that could affect job performance.
2) Taking proactive measures to adapt to changing conditions and avert workplace difficulties.
3) Proactively tackling workplace issues and implementing new methods.
4) Continuous personal growth and learning.

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These dimensions emphasise the significance of EDC in enhancing employee performance (Bieńkowska & Tworek, 2020). The long-term sustainable competitive advantage of a firm is greatly influenced by its current resource endowments and is also dependent on EDC (Eisenhardt & Martin, 2000; Bieńkowska & Tworek, 2020). However, current research on EDP in the digital age has overlooked the critical role of EDC. Past research indicates that among all variables influencing employee performance in a dynamic market, EDC is superior to employee attitudes and behavioural variables (Bieńkowska et al., 2021; Bieńkowska & Tworek, 2020; Tworek et al., 2023). Moreover, in a digital era, the effective utilisation of digital skills by employees to enhance their digital performance symbolises the success of digital transformation (Vial, 2019; Nambisan,2017; Saldanha et al.,2019).

From the organisational perspective in the digital market, researchers argue that the subjective agency of VRIN resources (DL, DC, HRMP, OL) is crucial in ensuring dynamic capabilities which include DL and dynamic capabilities (Mihardjo, Sasmoko, Alamsjah, et al., 2019a; Wang et al., 2022), DC and dynamic capability (Canhoto et al., 2021b; Cannas, 2023; Saputra et al., 2022), HRMP and dynamic capability (Apascaritei & Elvira, 2022; Garavan et al., 2016; Gutierrez-Gutierrez et al., 2018), and OL and dynamic capability (Chen & Zheng, 2022b; Farzaneh et al., 2021). In addition, empirical research provides evidence for the presence of moderators that influence the relationship between dynamic capability and SMEs' performance (Fainshmidt et al., 2016;Teece,2018).Scholars have repeatedly emphasised that when elements at the firm level (resources, dynamic capability, and strategy) align with each other and the external environment, competitive advantage is enhanced (Teece, 2018). According to Li et al. (2016), competitive environmental factors have the potential to

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impact firm performance. Therefore, organisations should adjust their management activities appropriately in response to environmental changes to foster a positive organisational climate that contributes to the achievement of organisational goals (Luthans & Stewart, 1997). Environmental dynamism refers to the uncertainty caused by fluctuations in the external environment on the internal operational activities of a business. Without a conducive organisational environment, it is challenging for employees to realise their job purpose (Hidalgo-Peñate et al., 2022). Although research indicates the technological environment moderates the relationship between dynamic capability and organisational performance (Chen & Zheng, 2022), the relationship among complex environments, dynamic capabilities, strategy, and performance towards the environment has not been investigated (Yıldırım Özmutlu & Arun, 2023).

Past research indicates that SMEs lack the necessary resources and capabilities to effectively compete with large firms based solely on their resources and capabilities (Chen et al., 2023). In China, Chinese SMEs and the current digital development of Chinese SMEs face five problems: resources, capabilities, employees, training, and strategy (SME Digital Development Research Report, 2022). While emphasising that dynamic capability must rely on VRIN resources to achieve a long-term competitive advantage, it remains unclear for different organisations which tangible and intangible resources possess the conditions defined by VRIN resources in a dynamic digital context. Moreover, SMEs undergoing digital transformation operate in a dynamically evolving market, where the RBT loses its effectiveness. To maintain a sustainable competitive advantage, firms must rely on dynamic capabilities.

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Moreover, research indicates that dynamic capabilities are more robust in addressing the challenges posed by volatile, uncertain, complex, and ambiguous (VUCA) market conditions (Eisenhardt & Martin, 2001; Teece, 2015). In 2014, Lin and Wu (2014) systematically developed a framework integrating VRIN resources, dynamic capabilities, and performance. This theoretical framework posits that dynamic capabilities most effectively mediate the impact of VRIN resources on performance (Li & Wu, 2014). However, it overlooks the relationship between the environment and performance within the context of dynamic capabilities. In 2018, Teece (2018) addressed the limitations of previous research by asserting that the interaction between the environment, strategy, resources, and dynamic capabilities can generate a sustainable competitive advantage. However, the study did not clearly establish the relationships among strategy, VRIN resources, dynamic capabilities, and performance. Therefore, this study was grounded in the RBT and DCT (Seddon, 2014; Lin &Wu, 2014; Teece, 2018), focusing on Chinese SMEs to explore how to leverage VRIN resources, strategy, and dynamic capabilities within the specific cultural environment of China to drive successful digital transformation. The following theoretical framework is constructed based on the above analysis.

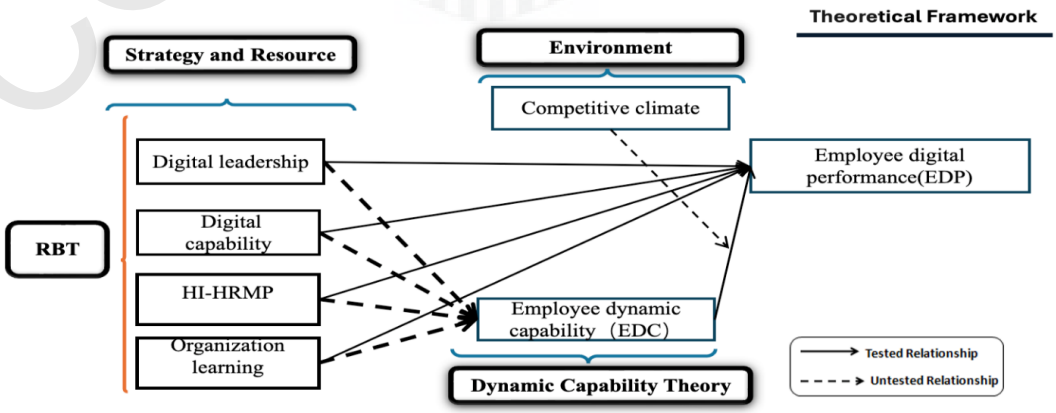

Figure 3.1 : Theoretical Framework

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3.3.2 Conceptual Framework

Based on the background of this study, the digital development of Chinese SMEs currently faces issues in four aspects: digital strategy, DC, HI-HRMP, and OL. According to the systematic literature review on independent variables, DL, DC, OL and HI-HRMP can contribute to sustaining organisational competitive advantages (Hashim Alzadjali et al., 2023; Khaw et al., 2022; Lenka et al., 2017; Paré & Tremblay, 2007). Past empirical research has demonstrated that organisational support factors have both direct and indirect effects on organisational performance or employee performance across various industries (Wang et al., 2024). Based on the differences in the evaluation criteria for traditional employee performance and EDP(Wang et al., 2024), the extent to which these organisational support variables significantly enhance EDP remains a gap in current research (Narayanamurthy & Tortorella, 2021; Shao et al., 2022). Therefore, further empirical evidence is required to substantiate the effectiveness of organisational support factors on EDP.

First, for SMEs to survive in the challenging digital marketplace, SMEs must fully leverage resources with VRIN (Valuable, Rare, Inimitable, Non-Substitutable) characteristics, namely digital resources, SHRMPs, and human capital (Canhoto et al., 2021; Kozlenkova et al., 2014; Seddon, 2014). Digital technology and innovation associated with RBT correlated highly with DL (Borah et al., 2022). Since HR managers and business executives drive digital workplace change, these leaders need successful leadership approaches to empower and innovate employees (Cahyadi et al., 2022). Specifically, optimising organisational performance is generally driven by heavyweight team leaders (Wasono & Furinto, 2018). Technology has also transformed human capital in SMEs, making leadership and HRMPs essential for

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digital organisations (Grigorescu et al., 2021). In SMEs, resources are the source of a firm's capabilities. DCs are valuable intangible assets of a company (Makhloufi et al., 2021; Ying et al., 2019), and serve as crucial sources of sustainable competitive advantage for SMEs (Aramburu et al., 2021). The essence of strategy development is to design a strategy that effectively uses these core resources and capabilities (Grant, 1991), according to Kravariti and Johnston (2020), the core resource of implementing all strategies is talent management. HRMP needs to be developed with HI-HRMP to cultivate committed employees with tacit knowledge that is hard to imitate or transfer (Biloslavo & Lombardi, 2021; Cao et al., 2022; Mathur, 2015; Rubel et al., 2023). In other words, in a dynamic market, organisational competitiveness must start by changing or updating the human capital and changing employee-based resources through the HRM system (Anastasiu et al., 2020; Sima et al., 2020; Wright et al., 1994).

Secondly, long-term competitive advantage is derived from the allocation of resources created by managers that utilise dynamic capabilities, rather than from their own competencies (Fabrizio et al., 2022; Karman & Savanevičienė, 2021). It enhances and adapts to the SMEs' ability to gain and maintain a competitive advantage in a rapidly changing business environment (Gherghina et al., 2020; Kabue & Kilika, 2016; Wuen et al., 2021). Modern organisations operate in a changing and dynamic environment, which results in today's work and the workplace being dynamic (Chumphong et al., 2020); therefore, dynamic capability is vital in SMEs (Khan et al., 2021). Moreover, with regard to mediating variables, the current research gap lies in the excessive focus of scholars on employee attitudes and behaviours while overlooking the impact of EDC on employee performance within organisations in a dynamic digital market (Bieńkowska et al., 2021; Bieńkowska & Tworek, 2020; Phan et al., 2022). Scholars

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have repeatedly demonstrated the superior impact of EDC on employee performance compared with employee attitudes and behaviour variables in rapidly changing markets (Bieńkowska et al., 2021; Bieńkowska & Tworek, 2020; Phan et al., 2022). Moreover, it has been frequently mentioned that HRMPs, leadership, OL, and DC contribute to EDC although there is a lack of empirical evidence (Bieńkowska et al., 2021; Bieńkowska & Tworek, 2020).

Furthermore, the influence of various factors on employee performance appears to be contingent upon the specific environment in which the firm operates, as empirical findings exhibit considerable variation across studies (Ceipek et al., 2021). There is empirical support for the presence of moderating variables in the relationship between antecedents and SME performance (Fainshmidt et al., 2016). Numerous scholars have demonstrated that cultural environments influenced by Confucianism in China have a positive impact on employee performance through the CC within organisations (Fousiani & Wisse, 2022; Irangani et al., 2021; Wang et al., 2018). In addition, the conditions under which dynamic capabilities add value have been a contentious topic and are largely dependent on various aspects of the external business environment (Drnevich & Kriauciunas, 2011). In stable environments where external changes are infrequent and often predictable and gradual, the role of dynamic capabilities is limited (Teece, 1997). Conversely, in fast-paced, unpredictable, and unstable environments, existing operational models quickly erode, making dynamic capabilities necessary for maintaining competitiveness (Wilden & Gudergan, 2015). Several relevant empirical studies are as follows. In 2018, Wang et al. (2018) were the first to directly propose a model to verify that the CC can moderate job crafting, enhancing employee performance (Wang et al., 2018). In 2020, Yang (2020) validated the impact of

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competitiveness on performance, and the study yielded antecedents and consequences of competitiveness. Research indicate that organisational culture and environment are important influential antecedent variables for achieving employee performance. This study collected data from employees of three different ethnic backgrounds, namely Caucasian, Chinese, and Korean (Yang, 2020). Moreover, a substantial body of empirical research has demonstrated that environmental variables moderate the relationship between dynamic capabilities and performance (Nedzinskas et al., 2013; Wang et al., 2024; Wang et al., 2018; Wilden et al., 2013; Wilden & Gudergan, 2015). However, exploring the role of environmental variables in the relationship between EDC and EDP remains a gap in current research. This study argues that in the digital era, the same applies to SMEs operating in dynamic and evolving markets. This study aims to examine DL, DCs, HI-HRMP, and OL as independent variables, EDC as mediating variables, and CC as a moderating variable between EDC and EDP, to investigate and analyse the development of EDP in Chinese SMEs based on the RBT and DCT.

Specifically, this study aims to investigate EDP in Chinese SMEs within a digital context. The study is driven by two main motivations. Firstly, given the large number of Chinese SMEs and the high CC they operate in, it is important to gain insights into the performance of their employees in the digital realm. Secondly, considering the global trend of digital advancement and transformation in the current economic landscape, it is essential to explore new avenues for SME development. Therefore, the analysis aims to provide a novel perspective on SME growth by taking these factors into account.

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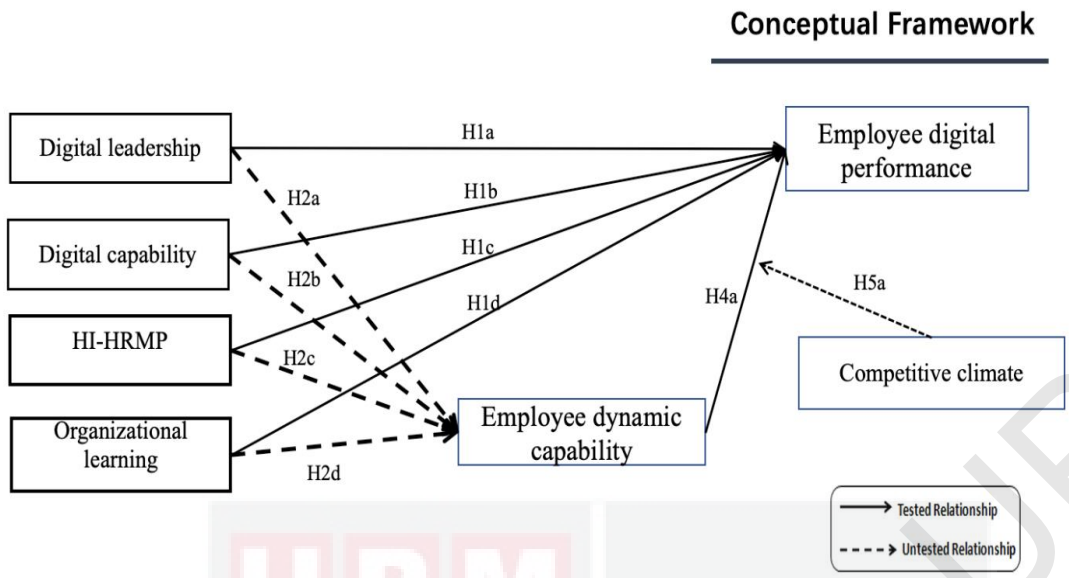

Figure 3.2 : Empirical Framework

3.4 Chapter Summary

Based on past research and analysis above, four gaps were found concerning the relationship between DL, DC, HI-HRMP, OL, EDC, CC, and EDP. Firstly, past research has examined the impact of DL (Mohamad et al., 2022; Muniroh et al., 2022), DCs (Heredia et al., 2022; Liu et al., 2023; Nasiri et al., 2020b; Saputra et al., 2022), HI-HRMP (Ismail et al., 2021; Cruz et al., 2022; Tahiri et al., 2020), and OL (Imani et al., 2020; Meher & Mishra, 2022; Putra & Ruslan, 2021) on organisational performance or employee performance. However, the discussion has highlighted the differences between employee performance and organisational performance, necessitating further analyses. Secondly, organisational support (top management, DCs, HRMP, OL) is repeatedly mentioned in the literature to enhance EDC. However, empirical validation of its effectiveness is lacking (Al Wali et al., 2023; Bieńkowska et al., 2021; Bieńkowska & Tworek, 2020; Tworek et al., 2023). Thirdly, scholars have shifted their focus towards organisational support factors such as top leadership and HRM to foster organisational performance through the development of DC. However,

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there has been limited research conducted on how OSV can promote EDP through the development of EDC, especially in a dynamic digital market (Phan et al., 2022). This study aims to expand upon the existing research on the correlation between OSV and EDP by delving deeper into the examination of EDC as a mediating factor between OSV and EDP in SMEs. Fourthly, the effect of EDC on job performance is influenced by both internal and external organisational environments. However, there is limited research on how competitive environment, such as the CC, moderate the relationship between EDC and EDP. Therefore, this study systematically reviewed relevant research conclusions and constructed a hypothesis relationship. There are a total of seven latent variables in this study, including independent, dependent, moderating, and mediating variables. Based on the research questions and objectives, the following hypothesis relationships were established. Table 3-1 summarises all the hypothesis relationships in this study.

Table 3.1 : Summary of Hypothetical Relationships for all Variables

Research Question	Hypothesised Relationships	
Antecedents -> EDP	H1a:	There is a positive relationship between DL and EDP in SMEs.
	H1b:	There is a positive relationship between DC and EDP in SMEs.
	H1c:	There is a positive relationship between HI-HRMPs and EDP in SMEs.
	H1d:	There is a positive relationship between OL and EDP in SMEs.
Antecedents -> EDC	H2a:	There is a positive relationship between DL and EDC in SMEs.
	H2b:	There is a positive relationship between DC and EDC in SMEs.
	H2c:	There is a positive relationship between HI-HRMP and EDC in SMEs.
	H2d:	There is a positive relationship between OL and EDC in SMEs.
EDC as a Mediator -> OSV and EDP	H3a:	EDC as a mediating variable positively affects the relationship between DL and EDP in SMEs.
	H3b:	EDC as a mediating variable positively affects the relationship between DC and EDP in SMEs.

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Table 3.1 : Continued

	H3c:	EDC as a mediating variable positively affects the relationship between HI-HRMP and EDP in SMEs.
	H3d:	EDC as a mediating variable positively affects the relationship between OL and EDP in SMEs.
Competitive Climate as a Moderator -> EDC and EDP	H4:	There is a positive relationship between EDC and EDP in SMEs.
	H5:	CC has a positive moderation effect between EDC and EDP in Chinese SMEs.

This chapter also discusses the conceptual framework of the current research, arguing the crucial point that organisations cannot sustain a competitive advantage in dynamic digital markets that rely solely on resources. It emphasises that only by adhering to the resource-dynamic capability-strategy framework and interacting with the external environment can an organisation maintain a competitive advantage in dynamically changing markets.

Lastly, the empirical framework analyses the differences in research on organisational resources (DL, DC, OL HI-HRMP) and dynamic capabilities concerning the CC and EDP. It identifies existing gaps in current research. The focus of this study is on Chinese SMEs, grounded in the specific regional context of China due to the unique characteristics and definitions of SMEs compared to other industries. Therefore, further empirical research is needed to demonstrate the relationships between these variables.

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CHAPTER 4

RESEARCH METHODOLOGY

4.1 Introduction

This chapter primarily discusses the design of the research, employing an empirical approach that elucidates the research worldview and utilises a quantitative methodology. The study's construction involved empirical research and discussion on independent variables, dependent variables, mediating variables, and moderating variables. This section explains the target population and sample framework of the research, utilising the purposive sampling method. The survey scope includes individuals from Shanghai, Guangdong, Anhui, and Guizhou who represent the first-tier, second-tier, and third-tier cities in China. The information source was a list of SMEs obtained from the respective official websites.

The chapter also discusses the sample size, pilot testing, and pre-testing procedures. Sampling techniques and analysis units are emphasised, along with data collection methods and instruments. The process of modifying measurement tools through adoption and adaptation to the research environment has been outlined. The proposed data analysis plan is discussed, including data screening, descriptive statistics, reliability, and validity assessment, as well as the use of Structural Equation Modelling (AMOS).

4.2 Research Philosophy

The word "research philosophy" relates to attitudes and assumptions about knowledge development (Saunders et al., 2019). Whether researchers are consciously aware of

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them or not, they will make various types of assumptions during every stage of their research (Burrell & Morgan, 2006). These assumptions include beliefs about human knowledge (epistemological assumptions), beliefs about the reality they encounter in their research (ontological assumptions), and the extent to which their values influence the process and manner of their research (axiological assumptions). These assumptions inevitably affect how researchers understand their research questions, the methods they employ, and how they interpret their findings (Corbetta, 2003).

Ontology refers to the assumptions about the nature of reality. Ontology shapes our understanding of the reality of business and management, thereby impacting our choice of research subjects (Saunders et al., 2019). How scholars comprehend reality is epistemology. Epistemology focuses on how researchers seek knowledge to understand reality, so it also affects how scholars judge good and evil and view the world (Carson et al.,2001). Axiology refers to the role of values and ethics within the research process. This includes questions about how we, as researchers, handle our values as well as those of our research participants (Saunders et al., 2019).

This study adopts the research philosophy of positivism, with CC as the moderator and EDC as the mediator, to investigate the promotion of EDP in SMEs in China. There are several reasons for choosing positivism as the research philosophy. Firstly, positivism emphasises objective observation and measurement of phenomena. The goal of this study is to explore effective pathways to enhance EDP, which requires data collection and analysis from SMEs. Positivism allows the use of systematic methods to collect quantitative data and ensures the objectivity of the research process (Schrag, 1992). Secondly, positivism focuses on determining causal relationships

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between variables. By adopting a positivist approach, this study can formulate testable hypotheses and use statistical analysis techniques to determine the relationships between variables of interest (Kaboub, 2008). This enables the generalisation of research findings to a larger population of SMEs operating in a competitive environment in China. Thirdly, positivism emphasises the use of rigorous scientific methods in research. By following the positivist method, the design of this study is structured, data collection is systematic, and analysis is conducted using appropriate statistical techniques. This enhances the validity and reliability of the research findings (Rehman & Alharthi,2021). Fourthly, positivism emphasises the measurement and quantification of variables (Park et al., 2020). This study requires the measurement of OSV, CC, EDC, and EDP.

Positivism provides a framework for developing effective and reliable measurement scales and utilising statistical methods to analyse collected data. It promotes replicability in research by providing clear and transparent methods. Therefore, this study allows other researchers to further their studies in promoting EDP in SMEs based on our findings (Park et al., 2020).

4.3 Research Paradigm

Paradigm refers to the worldview that guides researchers. The two philosophical orientations that support paradigms are positivism and realism (Saunders et al., 2019). In the field of business management, there are five main philosophies: positivism, critical realism, interpretivism, postmodernism, and pragmatism.

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4.3.1 Positivism

The positivist paradigm enables researchers to rely more on statistics and generalisations, leading to the development of universal laws and discoveries (Park et al., 2020). Epistemologically focuses on discovering observable and measurable facts and regularities. This means that only phenomena that can be observed and measured can generate reliable and meaningful data (Crotty, 1998). Positivism emphasises the search for causal relationships in data to create generalisations akin to laws, like what scientists do (Gill & Johnson, 2010). This research typically relies on existing theories to formulate hypotheses, which are then tested through data collection and analysis. The collection of factual data provides a foundation for hypothesis testing. Furthermore, positivists strive to minimise their own influence on the collected data (Dube & Pare, 2003).

4.3.2 Interpretivism

The interpretive paradigm enables researchers to gain a deeper understanding of the research by seeking experiences and perspectives within specific social contexts (Corbetta, 2003). As a critique of positivism, interpretivism emphasises its subjective viewpoint. It acknowledges that humans, unlike physical phenomena, create meaning and focus on studying these meanings. Interpretivism originated in 20th-century Europe and encompasses various branches such as hermeneutics, phenomenology, and symbolic interactionism (Cortina et al., 2001). Interpretivism research aims to generate a new and richer understanding of the social world and context. In business and management research, this requires studying organisations from different perspectives, recognising that different groups within an organisation, such as CEOs,

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managers, and employees, may experience different workplace realities. Similarly, differences based on gender, race, or cultural background also influence individuals' experiences of the workplace, services, or events. The interpretations of seemingly similar things vary across different historical or geographical contexts, adding complexity to organisations (Saunders et al., 2019).

4.3.3 Postmodernism

Postmodernism, with its connections to French philosophers such as Jean-François Lyotard, Jacques Derrida, Michel Foucault, Gilles Deleuze, Félix Guattari, and Jean Baudrillard, emphasises language and power relations. It seeks to challenge accepted ways of thinking and amplify marginalised alternative perspectives (Saunders et al., 2019). Postmodernists highlight the role of language and reject fixed, objective concepts of reality. They argue that order is temporary and constructed through language, which itself is partial and incomplete (Saunders et al., 2019). The understanding of what is "right" or "true" is collectively formed and influenced by power relations and dominant ideologies within specific contexts. Postmodernist researchers aim to expose and question these power relations and deconstruct established realities to reveal instability, gaps, and silences (Saunders et al., 2019).

4.3.4 Pragmatism

Pragmatism emerged in the late 19th to early 20th century in the United States through the works of philosophers such as Charles Peirce, William James, and John Dewey. It aims to reconcile objectivism and subjectivism, facts and values, and different background experiences (Saunders et al., 2019). Pragmatism focuses on the practical significance of theories, concepts, ideas, hypotheses, and research findings rather than

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their abstract forms. It values the capacity of knowledge to enable successful action and views reality as the actual outcome of thought (Saunders et al., 2019).

This study adopts a quantitative approach that aligns with the assumptions and epistemological beliefs of positivism. Positivism is a philosophical perspective that is based on quantitative research methods (Liboni et al., 2023). Quantitative methods aim to establish, validate, or confirm relationships between research constructs and generalise findings from a population sample to facilitate theory development (Corbetta, 2003). This approach often yields results that are either explanatory or predictive. Quantitative research also offers several practical benefits, including numerical descriptions of the population sample, the ability to use small samples to represent larger populations, fast data collection, and time efficiency (Corbetta, 2003).

First, this study explains theories by testing relationships between constructs, which reduces bias in the results (findings) by avoiding external influences and allows for replicability and generalisability of the research outcomes. The study adopts a cross-sectional survey design, collecting data and measuring participants' variables at a single point in time. Second, according to a systematic review, over 80% of researchers studying on factors influencing EDP have utilised the positivist quantitative research method. Third, the positivist paradigm is widely used in business school research, assuming that reality can be measured in a certain way (Idrees et al., 2011). Creswell (2014) highlights several limitations associated with the quantitative method i.e. the uncontrollability of participants' interpretation variations of questionnaires, low data quality, and low response rates, which may affect the reliability of survey results. Nevertheless, this study adopts this approach as it is

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suitable for large sample sizes, allows for separate analysis on the relationships between research constructs, and permits controlling variables. It also minimises external bias, ensuring data validity.

4.4 Research Design

Research design is a blueprint for how data will be collected, measured, and analysed, encompassing assumptions about data collection and analysis methods (Rahi, 2017). It serves as an overall framework that outlines how researchers will address research questions. It is crucial to clearly define the research questions to ensure the soundness of the design (Saunders et al., 2019). Research design includes specific objectives derived from the research questions, identification of data sources, data collection and analysis methods, and potential constraints such as data access, time, location, and funding (Saunders et al., 2019).

Saunders et al. (2019) stress the importance of demonstrating a comprehensive understanding and thoughtful consideration of each component of the research design as it enables researchers to make key methodological choices and utilise minimal resources to devise a survey structure that generates answers to the research questions. The research design combines the configuration framework and survey plan to explore and obtain empirical evidence on relationships between the research questions, structure, and research variables. It also discusses research methods and tools, research population, and sample size (Corbetta, 2003). In this study, the design also encompasses sampling techniques, questionnaire development, variable measurement, pretesting, and pilot testing.

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4.4.1 Research Methods

Quantitative and qualitative paradigms are two subsets of methodological choices in social research (Saunders et al., 2019). The quantitative paradigm is founded on the philosophy of positivism, where quantitative research is dedicated to precisely measuring certain variables. Quantitative methods address questions related to who, when, how much, and how often(Saunders et al., 2019). The validity of the data collected through surveys is considered central to this approach (Allwood, 2012). Positivism aligns with the hypothetico-deductive model of science, where quantitative research, by operationalising variables and employing measurement methods, seeks to establish explanatory associations or causal relationships(Park et al., 2020). It emphasises the empirical study of large samples, generalisability, replicability, and controlled experiments (Park et al., 2020b). Quantitative research methods, through the use of statistical tools and standardised measurement instruments, fully adhere to these principles of positivism, ensuring the scientific rigour of the research process and the objectivity of the findings (Azungah, 2018).

Additionally, the qualitative paradigm relies on the philosophy of interpretivism. The goal of qualitative research depends on the researchers' ability to immerse themselves in the events being studied and to collect information that can thoroughly explain what has occurred. It also illustrates how individuals connect with the things around them (Allwood, 2012). Qualitative methods emphasise "contextual understanding", where researchers typically seek to comprehend behaviours, values, beliefs, and more within the context in which the research is conducted (Patton et al., 2017).

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Inductive reasoning begins with specific observations or real-world examples and then uses these observations or examples to develop broader generalisations or theories. Inductive reasoning is commonly associated with qualitative research (Zalaghi & Khazaei, 2016). Qualitative methods involve collecting detailed data and forming theories or insights based on these data. Inductive reasoning helps explore complex phenomena or generate new theories, offering an effective method for qualitative data analysis (Kane et al., 2021).

In contrast, deductive reasoning starts with general theories or hypotheses and are then tested through specific observations or experiments. This approach moves from the general to the particular (Park et al., 2020). Hypotheses are proposed based on the theory and tested through observations or experimentations. The results determine whether the hypotheses are supported or refuted (Park et al., 2020). Deductive reasoning is typically associated with quantitative research, where researchers first propose a theory or hypothesis regarding the relationship between variables and then use statistical methods to test whether the data support the hypothesis (Azungah, 2018). Because deductive reasoning emphasises verification, it is well-suited for testing theories using numerical data, while inductive reasoning is more commonly used in qualitative research (Azungah, 2018). In summary, this study employs a quantitative research approach combined with deductive reasoning. The study first establishes a theoretical foundation based on the RBT and DCT, constructs a research framework, and then formulates hypotheses which are tested through data collection and analysis.

Previous research has also discussed mixed-method approaches (both qualitative and quantitative) (Benitez et al., 2022a; Çini et al., 2023). The adoption of the quantitative

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approach in this study are primarily due to several considerations. First, the study aims to verify specific relationships between the variables, and these relationships are typically better suited for examination through quantitative research (Taherdoost, 2022). Second, the use of Structural Equation Modelling (SEM) in this study addresses the hypotheses effectively, and the quantitative method offers statistical advantages that provide objective, measurable results (Taherdoost, 2022). Third, Akcam et al. (2019) point out that in cases where research aims to analyse predictive factors of outcomes or to test theories, the quantitative method is the most appropriate as it enables researchers to collect large samples of data at a low cost (Taherdoost, 2022).

This approach enhances the representativeness of the research findings, allowing them to be generalised to a broader population (Park et al., 2020). Conversely, qualitative methods alone cannot provide sufficient sample size or statistical power to support such analysis. Therefore, this study concludes that the quantitative research approach is adequate to achieve its objectives. Moreover, this study selects SEM because it enables the analysis of complex relationships between latent variables while simultaneously testing mediation and moderation effects (Kline, 2023; Adeoye-Olatunde & Olenik, 2021; Taherdoost, 2022). In addition to using the quantitative approach of SEM, several alternative methods were considered to enhance the robustness of the research. For instance, in qualitative research, case study analysis could be employed: By examining specific enterprises in the four regions, case studies provide an in-depth understanding of digital transformation in SMEs. This approach allows for an exploration of the roles of organizational support, EDC, and CC in shaping EDP. However, the generalizability of case study findings is limited, making it less suitable for large-scale analysis (Sai et al., 2024).

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Interviews and Focus Groups: Conducting semi-structured interviews with SME employees and managers can provide qualitative insights into the challenges and benefits of digital transformation. While this approach offers rich, context-specific data, it lacks the ability to establish causal relationships and quantitatively measure variable interactions (Adeoye-Olatunde & Olenik, 2021). Regression Analysis: Traditional multiple regression models can be used to examine the impact of organizational support variables on employee digital performance. However, regression analysis does not account for latent variables, making it less effective in testing mediation and moderation effects (Montgomery et al., 2021).

While SEM provides a robust approach for analyzing complex relationships between variables, its limitations must be acknowledged in this study.

Dependence on Large Sample Sizes: SEM requires a large sample size to ensure the stability and reliability of parameter estimates (Hair et al., 2021). With 551 valid responses, the sample size may be moderate; however, for highly complex models, it remains on the borderline, potentially affecting the robustness of results.

Assumption of Linear Relationships: SEM primarily assumes linear relationships between variables. However, in the context of digital transformation, these relationships may be nonlinear or dynamic, which SEM may not fully capture. For instance, the impact of DL on EDP may exhibit threshold effects or diminishing returns, which a linear model cannot adequately explain (Hair et al., 2021).

Risk of Model Misspecification: The validity of SEM relies on the correct specification of the theoretical model. Incorrectly including or excluding variables,

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misidentifying causal directions, or overlooking unobserved confounding factors can lead to model misspecification, thereby reducing the accuracy of results (Hair et al., 2021; Kline, 2023).

Limitations in Measurement Models: SEM assumes that latent constructs can be accurately measured through observed indicators (Kline, 2023). However, weak measurement validity or reliability may introduce bias in parameter estimation. Despite rigorous validation (e.g., CFA for construct reliability), some degree of measurement error remains inevitable (Kline, 2023).

Challenges in Establishing Causality: Although SEM can test causal relationships, it remains a correlational method (Hair et al., 2021). The cross-sectional nature of this study limits the ability to establish clear causal links between OSV and EDP. A longitudinal SEM approach could provide deeper insights into causal dynamics.

Sensitivity to Model Fit Indices: SEM results are highly dependent on model fit indices (e.g., CFI, RMSEA, SRMR). While good fit values indicate statistical acceptability, these indicates do not necessarily confirm that the model accurately reflects reality(Hair et al., 2017). Alternative model structures may also yield acceptable fit, leading to potential model ambiguity.

Potential Solutions to Address These Limitations: To mitigate these issues, future research could increase the sample size to enhance model robustness (Kline, 2023; Hair et al., 2021). Ultimately, SEM was chosen as the primary method due to its ability to analyze complex theoretical frameworks, test mediation and moderation effects, and empirically validate hypotheses. However, future studies could further explore the

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dynamics of SME digital transformation by integrating qualitative insights or advanced econometric techniques (Kline, 2023; Adeoye-Olatunde & Olenik, 2021; Taherdoost, 2022).

4.5 Sampling Design Process

The sampling design process refers to the systematic procedure of selecting a representative sample from a larger population for research purposes. It includes several steps to ensure that the chosen participants or units accurately represent the characteristics and diversity of the population under study (Saunders et al., 2019). The sampling design process typically involves the following steps:

Table 4.1 : Sampling Design Process

No	Content
Step 1	To clearly define the population of interest for the study, it is necessary to determine the specific characteristics, demographics, or criteria that define the population.
Step 2	Develop a list or source from which to extract the sample. This can be a comprehensive list of individuals, organisations, or units that constitute the target population.
Step 3	Select an appropriate sampling method that aligns with the research objectives and characteristics of the target population.
Step 4	Determine the number of participants or units that will be included in the sample. The sample size should be sufficient to provide statistically meaningful results, considering resource limitations and the desired level of precision.
Step 5	Carry out the actual selection of participants or units based on the chosen sampling method (Saunders et al., 2015, p. 168).
Step 6	Evaluate potential sources of sampling bias and errors that could affect the representativeness of the sample.

(Information sources: Saunders et al. 2015, p. 169; Etikan & Bala 2017; Murairwa 2015)

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4.5.1 Population, Target Population, and Unit of Analysis

The population refers to the complete collection of cases or elements from which a sample is selected (Saunders et al., 2019), and sampling offers a reliable alternative to conducting a census in situations where it is not feasible to survey the entire population due to impracticality, budget limitations, or time constraints (Saunders et al., 2019). The target population of this study is employees of SMEs participating in digital transformation in China, and specifically located in the four selected regions. The SMEs selected should possess the following characteristics: each SME will have at least 20 employees (Jia et al., 2020), and they must be involved in digital operations (Vial, 2019; Zhang et al., 2024). These characteristics help in the selection of suitable samples and a more focused analysis of the impact of digital transformation on EDP in Chinese SMEs (Saunders et al., 2019).

China is a vast country with diverse regional features. Analysing the geographical distribution of the respondents help identify variations in digital transformation across different provinces, municipalities, or cities. This provides a better understanding of regional policies, infrastructure, and challenges that influence the digital transformation of Chinese SMEs (Wang et al., 2022). Moreover, Chinese SMEs span across multiple industries such as manufacturing, services, and technology. Examining the distribution of respondents across different industries allows for a deeper understanding of the challenges, opportunities, and levels of digital maturity in specific sectors. Chinese SMEs encompass a range of company sizes, from micro-enterprises to SMEs (Wu et al., 2022). Furthermore, when employing purposive sampling to identify survey participants, the study aims to include as many SMEs

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undergoing digital transformation from various industries as possible, based on the list of SMEs listed in each region.

The reasons for selecting employees of SMEs as the subjects of investigation in this study are as follows: Firstly, directly surveying employees enables a comprehensive understanding of their perspectives and behaviours regarding perceived organisational support (DL, HI-HRMP, DC, OL), thus delving into how these factors influence EDP in SMEs (Wang et al., 2024). Secondly, employees possessing firsthand knowledge and experience in interacting with managers, using digital technologies, and understanding the competitive climate of organisations, provide valuable insights into the effectiveness of influencing EDP in SMEs (Shwedeh et al.,2023). Thirdly, by understanding employees' viewpoints, challenges, and needs, SMEs can identify areas for development and optimise internal management to improve EDP (Nguyen, 2009). Additionally, employees constitute a significant proportion of the labour force in SMEs; hence, surveying employees allows for a more comprehensive understanding of the overall digital development effects of SMEs, avoiding discrepancies between survey results and objective reality caused by managerial exaggeration (Baccarella et al., 2022). Finally, compared to surveying managers, surveying employees is often more feasible in terms of resources and access. Employees are typically more accessible and have higher response rates, allowing for a larger and more representative sample size. This feasibility aspect contributes to enhancing robustness and reliability (Zoppelletto et al., 2023).

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4.5.2 Sampling Method

Probability sampling involves randomly selecting samples from a sampling frame, allowing for the probability of any case to be included in the specified sample. However, in business research such as market surveys and case studies, this may not be feasible (due to lack of sampling frames) or suitable for addressing the research questions. This means researchers must select samples in other ways (Saunders et al., 2019). Valliant (2020) argues that when properly implemented, non-probability sampling techniques can yield effective and beneficial results. Furthermore, non-probability sampling is particularly suitable for social science research, given that obtaining a complete list of all individuals within a population remains a significant challenge (Rowley,2014).

Non-probability sampling techniques are generally categorised into four types: convenience sampling, purposive sampling, quota sampling, and snowball sampling (Rahman, 2023). Convenience sampling selects a sample from a group that is accessible. This strategy is used when data must be collected fast, or when other sampling methods are not possible. However, this method may add bias as the sample may not exactly represent the population, limiting generalisability (Etikan, 2016). Quota sampling is a non-probability sampling strategy in which researchers split the population into subgroups or quotas based on characteristics set and determine the number of participants from each grouping. This method can reflect relevant subgroups, but the non-random selection procedure may add bias, resulting in a sample that does not fully represent the population (Yang & Banamah, 2014). Snowball sampling is used in hard-to-reach or hidden population research. Researchers choose a small group of participants who match the study criteria, and they refer others,

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creating a “snowball” effect that grows the sample. Snowball sampling is non-random and includes interrelated people, which may induce bias and limit research generalisability (Naderifar et al., 2017).

Although it is feasible to identify a list of SMEs in the survey area, it is not entirely possible to determine the total number of employees who meet the inclusion criteria. Specifically, there is a lack of a sampling frame for employees within SMEs undergoing digital transformation, making probability sampling techniques inapplicable (Sarstedt et al., 2018). Consequently, this study adopted purposive sampling, which is advantageous in selecting samples based on research objectives while minimising the risk of sampling frame error (Sekaran & Bougie, 2013). Respondents were selected according to characteristics deemed appropriate by the researchers (Sarstedt et al., 2018). Purposive sampling involves intentionally selecting participants based on specific characteristics they possess. It is a non-random technique that does not require a theoretical basis or a specific number of participants (Etikan, 2016). Essentially, researchers decide what they need to know and then seek individuals who can and are willing to provide information based on their knowledge or experience (Bernard, 2017). The purpose of purposive sampling is to better align the sample with the objectives of the research, thereby enhancing the rigour of the study and the credibility of the data and results. Four aspects describing this concept are credibility, transferability, dependability, and confirmability (Campbell et al., 2020). Due to the high level of randomness associated with methods like snowball sampling and others (Naderifar et al., 2017), they are deemed unsuitable for this study. Thus, the purposive sampling approach adopted in this study ensures comprehensive

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coverage across different regions and industries, enhancing the universality of the research findings.

According to the classification criteria of purposive sampling (Table 4.2), firstly, the samples are similar because they meet the criteria defined for SMEs (Jia et al.,2020), and secondly, employees of each surveyed enterprise are involved in digital operations. In other words, specific selection criteria do exist for this study although a sampling frame cannot be established, and probability sampling cannot be used. Nevertheless, the survey scope does include representative regions and various industries of SMEs, thus ensuring its generalisability. Table 4.2 presents the main criteria for selecting purposive sampling.

Table 4.2 : Purposive Sampling Categories

Group	Technique	Likelihood of sample being representative	Types of research in which useful	Relative costs	Control over sample contents
Quota	Quota	Reasonable to high, although dependent on selection of quota variables	Where costs constrained or data needed very quickly so an alternative to probability sampling needed	Moderately high to reasonable	Specifies quota selection criteria
Purposive	Extreme case	Low	Unusual or special	Reasonable	Specifies selection criteria
	Heterogeneous	Low, although dependent on researcher's choices	Reveal/illuminate key themes	Reasonable	Specifies selection criteria
	Homogeneous	Low	In-depth focus	Reasonable	Specifies selection criteria
	Critical case	Low	Importance	Reasonable	Specifies selection criteria
	Typical case	Low, although dependent on researcher's choices	Illustrative	Reasonable	Specifies selection criteria
	Theoretical	Low	Inform emerging theory	Reasonable	Specifies selection criteria
Volunteer	Snowball	Low, but cases likely to have characteristics desired	Where cases difficult to identify	Reasonable	Selects initial participant
	Self-selection	Low, as cases self-selected	Where access difficult, research exploratory	Reasonable	Offers only general invitation
Haphazard	Convenience	Very low (often lacks credibility)	Ease of access	Low	Haphazard

(Source: Kevin 1999; Patton 2002; Saunders 2012)

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Figure 4.1, demonstrates the reasons for employing purposive sampling in this study (Saunders et al., 2019).

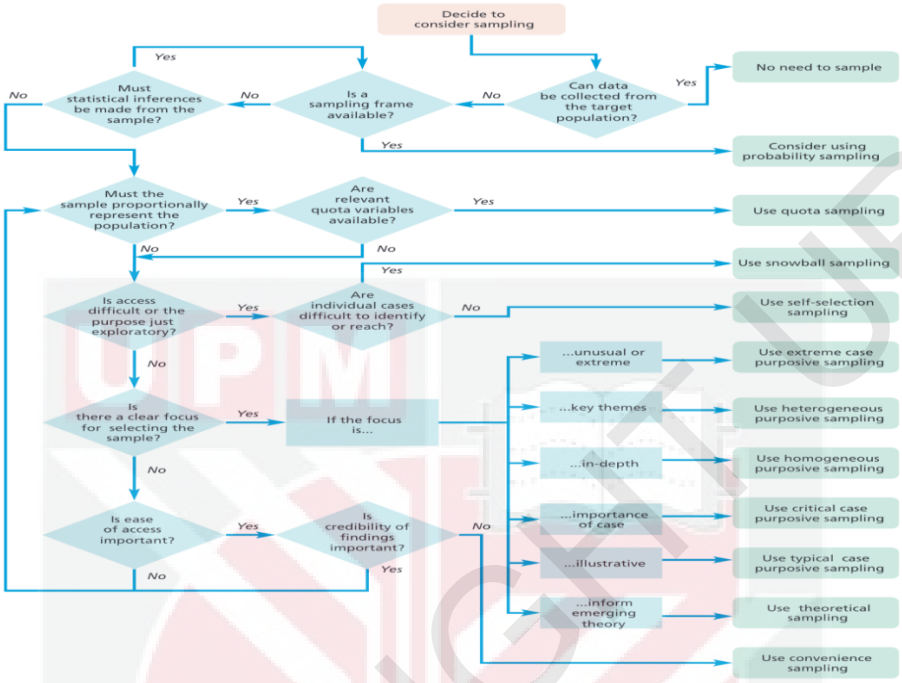

Figure 4.1 : Flow Chart of Purposive Sampling Selection

4.5.3 Survey Distribution

The Chinese government has introduced various initiatives and policies to encourage digital transformation, particularly among SMEs. Regions like Shanghai and Guangdong are at the forefront of implementing these policies, while Anhui and Guizhou are target areas for digital development and industrial upgrading. This regional diversity reflects both leading and emerging practices in digital transformation, providing valuable insights into the role of regional policy environments in shaping digital performance (Luo & Zhou, 2022). Thus, to ensure the survey results are representative, the survey covers four representative regions in China (Shanghai, Guizhou, Guangdong, and Anhui). This approach aims to

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comprehensively represent the overall level of SMEs in China utilising digital technology to enhance EDP. Additionally, each selected province represents different economic characteristics: Shanghai, the financial and economic centre; Guangdong Province, known for its manufacturing and trade; Anhui Province, with historic industries and rising economies; and Guizhou Province, undergoing digital transformation (Zhou et al., 2022). Moreover, China boasts a robust network communication system, facilitating data collection for the survey. The surveyed regions represent first-tier, second-tier, and third-tier cities in China, ensuring the universality of the survey results (Zhou et al., 2022).

From an industry perspective, this study selects these four regions primarily based on their significant differences in digital economic development levels, industrial structures, and regional economic policies (Teng et al., 2022). By comparing regions with varying levels of development, this study provides a comprehensive reflection on the current state of digital transformation among technology-based SMEs in China, along with the opportunities and challenges they face. Moreover, tailored strategies can be proposed based on the developmental status of each region to promote the digitalization of SMEs (Li & Liu, 2021).

Specifically, Shanghai and Guangdong exhibit significantly higher levels of digital economic development than the national average, which can be attributed to their well-established industrial infrastructure, robust digital ecosystems, and strong government policy support (Teng et al., 2022).

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In contrast, Anhui's digital economy is at a moderate level, with the government playing a crucial role in promoting high-tech manufacturing industries. However, its digital infrastructure still lags behind that of coastal regions. Meanwhile, Guizhou, as a relatively underdeveloped region, has actively promoted the digital industry through a big data strategy in recent years. Nonetheless, SMEs in Guizhou continue to face considerable challenges in digital transformation, particularly in terms of infrastructure and technological application (Anhui SME Information Network, 2024; Liu, 2025).

Specifically, the surveyed SMEs in the four regions exhibit significant differences in the process of digital transformation, industrial foundation, policy support, talent concentration, and market operating environment.

Digital Empowerment: Guizhou's abundant mineral resources have led its SMEs to concentrate primarily in resource-based industries. In contrast, Anhui's digital economy policies focus on intelligent manufacturing and high-tech industry upgrades, whereas Guizhou relies more on a government-led big data development strategy to compensate for its weaker market-driven approach (Luo & Zhou, 2022; Wang et al., 2022).

Policy Support: Shanghai benefits from national digital economy pilot policies, with the government investing substantial resources in promoting digital technology innovation and enterprise digitalization (Teng et al., 2022). Meanwhile, Guangdong's open policies and coastal advantages have fostered the rapid growth of its

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manufacturing sector, particularly in home appliances and electronic information industries (Industry Watch Network, 2024; Teng et al., 2022).

Talent Attraction: Economically developed regions such as Shanghai and Guangdong boast abundant talent resources and high-level educational and research institutions, providing strong human capital support for SMEs. In contrast, although Anhui and Guizhou produce a significant talent pool, the relative scarcity of high-quality enterprises limits the talent agglomeration effect compared to the former regions (Industry Watch Network, 2024; Liu, 2025).

Business Environment: Coastal regions such as Guangdong and Shanghai feature high marketization and openness, offering SMEs broad market opportunities and development potential. However, these developed regions also exhibit intense competition. Conversely, inland regions like Anhui and Guizhou face relatively limited market environments and lower competitive pressures, affecting the industry distribution and development pace of SMEs (Teng et al., 2022). Therefore, examining the variations in digital economic development, policy support, talent attraction, and competitive environments across these four regions helps determine whether these factors influence the EDC of technology-based SMEs. Under the moderating effect of the CC, EDP in different regions may exhibit distinct characteristics.

In conclusion, this study examines the digital transformation pathways of technology-based SMEs from a regional perspective, exploring how different levels of digital economic development influence digitalization processes (SME Information Network, 2024; Industry Watch Network, 2024). By comparing SMEs across different regions,

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this research not only reveals how disparities in digital economic development impact EDP but also provides empirical evidence for policymakers to formulate more targeted digital transformation policies. Furthermore, investigating regional digital development levels allows for a deeper understanding of the challenges faced by technology-based SMEs in less-developed areas. The selection of diverse regions ensures that the conclusions of this study are not confined to a single economic zone but offer a broader perspective on how digital transformation unfolds across various economic and industrial sectors in China. Additionally, in terms of research methodology, this study employs survey-based data collection and SEM for quantitative analysis, ensuring the scientific rigor and reliability of the findings (Kline, 2023; Hair et al., 2021).

4.5.4 Sample Size

The primary form of data correlation analysis is the Structural Equation Model (SEM) method. It is well known that to maintain the rigour of the analysis, adjustments to the sample size are necessary although there are cutoff points for sample size in SEM techniques (Raoprasert & Islam, 2010). According to Hooper and Martin (2008), in SEM research, a sample size ranging from 100 to 200 is considered medium, while 200 or more is considered large (Hooper & Martin, 2008).

A sample size calculator will determine the required sample size for SEM research, taking into account the number of observed and latent variables in the model, the anticipated effect size, and the desired probability and statistical power levels. The calculator will provide the minimum sample size needed to detect the specified effect, and the minimum sample size required given the complexity of the model. Figure 4.2

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displays the Daniel Hooper sample size calculator. Researchers need to input the necessary parameter values and then click “Compute.”

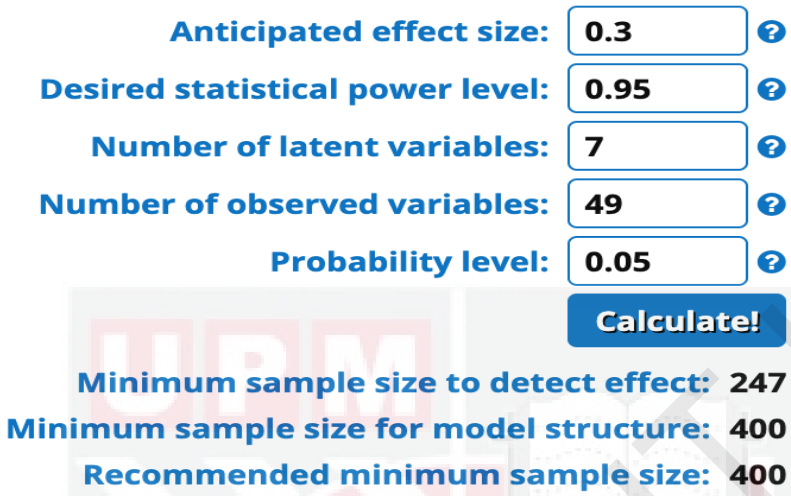

Figure 4.2 : Indicating Daniel-Hooper Sample Size Calculator

The computed result above indicates that a sample size exceeding 400 aligns with the empirical rule in SEM-related literature. In this study, questionnaires were distributed more than 400 due to the reason it is always difficult to get the responses especially from employees in the SMEs. As, this study proposed to collect data from four regions in China, careful plan for data collection process must be organised to achieve the minimum target of responses.

4.6 Research Instruments

There is no doubt that the quality of the instruments used in any research is very important as the conclusion of the study often depends on the accuracy and credibility of the information provided by the instruments researchers use. Therefore, reliability and validity are necessary conditions for a good measurement.

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In a study, the researcher should carefully examine the instrument used and test its reliability and validity so that reliable and accurate data can be expected. The following section explains the process of obtaining reliability and validity for this study. Research tools can be operationalised and measured in terms of structure and/or dimensions. Creswell (2014) identifies three methods for obtaining instruments for research. Researchers can choose to develop a new instrument, identify one used in well-known academic research and modify it, or find one from previous studies and adopt it entirely. Creswell (2014) notes that modifying an instrument involves tracking existing instruments and making changes to adapt them to the current research context. However, if the desired instrument cannot be found in the literature, it must be developed by the researcher. The process of developing a tool is challenging and involves a series of validity and reliability tests. For this reason, in this study, a tool from previous research on digital transformation in research on SMEs was adapted and adopted. When an instrument undergoes modifications or when various instruments are combined for research, the original validity is lost, and therefore, new validity must be established through pilot studies (Saunders et al., 2019).

4.6.1 Validity of the Instruments

Validity refers to the appropriateness, significance, correctness, and usefulness of an inference made by a researcher (Fraenkel et al.,2012). In other words, an instrument's validity refers to how well it measures the variable. Since validation is the process of gathering and evaluating data to support research conclusions, it is the most crucial concept to consider while creating or choosing an instrument. Common types of validity include face validity, content validity, criterion validity, and construct validity. Firstly, face validity is established by measuring whether a question measures an

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expected concept (Nardi, 2018). In simple terms, face validity means that the items selected in the instrument appear to meet the measurements. It aims to look at the operationalisation and check whether, "on its face", the instrument appears to be good. However, researchers may have errors in measuring a concept, coupled with respondents understanding and responses that may be inaccurate. Therefore, face validity is not a perfect measure of an item's validity. Secondly, content validity is a measure of face validity, which aims to examine the fitness and logical coherence between the measurement content and the measurement objective. Moreover, content validity refers to the degree to which the questions within an instrument and the resulting scores accurately represent all potential inquiries of the content area (Creswell, 2012). Thirdly, criterion-related evidence of validity refers to the relationship between the scores obtained using the instrument and the scores obtained using one or more other instruments or measures, which are called criteria (Creswell, 2012; Fraenkel et al., 2012). Finally, construct-related evidence of validity pertains to the nature of the psychological construct of characteristics being measured by the instrument (Fraenkel et al., 2012). It is the process of figuring out the significance, function, and application of an instrument, and theoretical study frequently uses it.

In the current study, three methods were mainly used to ensure validity. First of all, face validity and content validity were used in this study to ensure that the designed questionnaire aligns well with the research subjects. The researcher primarily investigates how employees utilise digital technologies to improve EDP by OSV, focusing on SMEs across the four regions in China. The researcher designed a questionnaire based on the research questions to investigate whether OSV can stimulate employees' work motivation and enhance their digital performance.

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Secondly, after designing the questionnaire, it was sent to three experts in human resources and business management from Guizhou Normal University, Xidian University, and Bozhou University for assessment to thoroughly confirm its validity (Appendix F-2; Appendix F-3; Appendix F-4). These experts evaluated the instrument in terms of face, content, and translation consistency, and proposed suggestions for improvements. Finally, the construct validity of these instruments was verified. Construct validity indicates the extent to which a measurement instrument accurately measures the theoretical construct or feature it is designed to measure (Jackson et al., 2009; Ary et al., 2014). A common method for assessing construct validity is to analyse the internal structure of the construct through statistical methods such as confirmatory factor analysis (CFA) to test whether all the items that make up the construct are measuring the same thing. The measurement scales for the construct validity of the research framework were tested through a pilot test, as detailed in Section 4.8 of this chapter. The final questionnaire survey was approved by the Ethics Application Committee of Universiti Putra Malaysia (UPM) (Appendix E).

4.6.2 Questionnaire Translation

The questionnaire for this study was designed in both Chinese and English versions. Since the research was conducted in China, the participants could only respond to the Chinese questionnaire. The researcher first developed a Chinese version of the questionnaire. All the scales used in this study were selected from well-established English versions based on the research questions, meaning all the items were originally in English. To facilitate the respondents' understanding, the researcher translated these items into Chinese. After the translation, an English language expert was consulted to verify the accuracy of the translation, ensuring that no discrepancies

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arose between the two language versions. The translation of the questionnaire between Chinese and English was conducted following strict academic standards, referencing the back-translation method (Sun et al., 2023). During the translation process, we consulted linguistic experts to ensure accuracy, clarity, and cultural relevance. Details of the experts can be found in Appendix F-4. The researcher first designed a complete English version of the questionnaire. The items for the Chinese versions of the DL, DC, HI-HRMP, OL, EDC, CC, and EDP scales were adapted from the works of Borah et al. (2022), Khin and Ho (2019), Rubel et al. (2017), Wang et al. (2018), and Shao et al. (2022). The demographic characteristics and academic performance sections were developed by the researcher. To maintain accuracy and consistency between the Chinese and English versions, the back-translation technique proposed by Brislin (1986) was then employed to translate the 45-item English questionnaire into Chinese.

4.6.3 Higher Response

To improve the response rate and obtain more responses for this survey on digital transformation in SMEs in the selected regions (Shanghai, Guizhou, Guangdong, and Anhui), the following strategies were implemented:

1) Measures were taken to ensure the survey questions were clear, concise, and relevant to the research objectives; 2) the number of open-ended questions was minimised and appropriate response formats, such as multiple-choice or Likert scales were used to help participant in giving their responses as suggested by Stantcheva (2023); 3) an engaging introduction that explains the purpose and importance of the study was provided at the beginning of the questionnaire; 4) clear instructions on how to complete the survey and estimation of time required were stated clearly; 5)

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assurance was given to participants of the confidentiality and anonymity of their responses as suggested by Ward and Meade (2023); 6) survey invitation was personalised as much as possible as suggested by Stantcheva (2023); and 7) the recipient's name was used and emphasise the relevance of the survey to their specific industry or business was emphasised in the message as recommended by Stantcheva (2023).

Personalisation helps raise awareness of the importance of the survey and encourages participation. According to Stantcheva (2023), researchers should consider offering incentives or rewards to participants to motivate them to complete the survey. This could include giving small gifts, discounts, or entry into a prize draw. However, when giving incentives or rewards, Ward and Meade (2023) stress the importance of ensuring that the incentives are relevant to SMEs and are aligned with ethical guidelines. Apart from this measure, follow-up reminders should be sent to non-respondents, and researchers should also consider leveraging partnerships with local organisations or institutions to reach a broader audience by identifying and collaborating with influential individuals or organisations in the SME community (Patten, 2017). According to Patten (2017), this act can help promote the survey and encourage participation as respondents share the survey link with their networks or followers which can significantly increase the visibility and response rate of the survey. Positive communication should also be maintained with respondents throughout the survey period, and researchers should respond promptly to any questions or concerns and provide feedback on the progress of the survey. Engaging with respondents creates a sense of involvement and encourages them to complete the survey. Researchers should express gratitude for participants' time and effort and consider sending a thank-

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you message or email to express their appreciation as this small gesture can leave a positive impression and encourage future engagement (Patten, 2017).

4.6.4 Time Horizon

When designing research, an important consideration is whether the researchers want it to capture a "snapshot" of a specific moment in time, or if they want it to resemble a diary or a series of snapshots, providing a representation of events over a given period. The choice between these approaches depends on the current research questions. The term "cross-sectional" refers to the "snapshot" time horizon, while the term "longitudinal" refers to the "diary" perspective (Saunders et al., 2019). The term "cross-sectional" is used to describe a research approach that focuses on studying specific phenomena (or variables) at a particular point in time, while the term "longitudinal" is used to describe a research approach that allows for the study of changes and developments over time.

The choice of data collection method depends on the research question (Saunders et al., 2019). Cross-sectional research involves studying specific phenomena (or variables) at a particular point in time. Researchers using this approach may aim to describe the prevalence of a phenomenon (e.g., the IT skills possessed by managers in an organisation at a given time) or explain how factors relate in different organisations (Saunders et al., 2019). Therefore, the cross-sectional research method involves collecting data from a population at a specific point in time to analyse relationships between variables and their prevalence. It provides a "snapshot" of a population at a particular moment, allowing for comparisons across different groups, but it cannot assess changes over time or establish causal relationships. This method is commonly

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used in the social sciences due to its speed and cost-effectiveness (Saunders et al., 2019). Based on the analysis above, this study adopts the cross-sectional research approach.

4.6.5 Fair Distribution and Non-Bias

Firstly, it is important to clearly define the criteria for selecting the SMEs. These criteria align with the official Chinese definition of SMEs. For this study, SMEs representing different industries within the technology-based SMEs were chosen. Efforts were made to reach out to different types of SMEs in each city. Factors such as industry sector, company size, and level of digitalisation were considered when selecting respondents. This approach helps ensure the representativeness of the sample and reduces the risk of bias due to over- or under-representation of specific types of SMEs (Chen et al., 2021).

Secondly, communicating the purpose of the survey and providing detailed instructions to participants is important. Researchers need to ensure that respondents understand the questions and how to provide accurate and honest answers. Instructions need to be clear to minimise response biases and ensure data quality (McGarvey et al., 2016). Respondents need to be assured that their answers will remain anonymous and confidential. It should be clearly stated in the survey instructions or introductory information that individual responses would not be linked to specific organisations or individuals. This helps encourage participants to provide honest and unbiased feedback (McGarvey et al., 2016).

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Finally, the survey questions need to be neutral and free of bias (Ward & Meade, 2023). Leading questions that may prompt respondents to give specific responses need to be avoided, and concise and clear language should be used to ensure questions are easily understood by participants. A pilot test with a small group of SMEs has been done to identify any potential biases or issues in the survey design to enhance the fairness and effectiveness of the survey (Chen et al., 2021). When analysing and reporting survey results, objectivity and transparency must be ensured. Survey findings need to be presented in an unbiased manner, emphasising both positive and negative aspects. Any limitations or potential biases that may affect the results should be clearly mentioned (Chen et al., 2021).

4.7 Data Collecting Method

4.7.1 Validity and Consistency

To ensure the validity and consistency of data. This study employed the following practices:

Table 4.3 : Summary of Data Collection Methods

Data Collection Step	Description
Step1: Validated measurement	All scales used in this study are validated measurement scales or questionnaires.
Step 2: Sampling Strategy	Choose a purposive sampling strategy to target SMEs in Shanghai, Guizhou, Guangzhou, and Anhui.
Step 3: Sample Selection	Identify SMEs in the target cities using official business directories, industry associations, and online platforms.
Step 4: Survey Design	Design a comprehensive questionnaire with clear instructions, relevant questions, and appropriate response options.
Step 5: Pretesting	Conduct a pilot test of the survey with a small group of SMEs to identify any issues and make necessary revisions.
Step 6: Survey Distribution	Distribute the survey through multiple channels, including email invitations, social media platforms, and industry networks.

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Table 4.3 : Continued

Step 7: Communication	Communicate the purpose, voluntary nature, and confidentiality of the survey clearly to potential respondents.
Step 8: Reminder Messages	Send reminder messages to non-respondents at strategic intervals to encourage participation.
Step 9: Data Collection	Collect survey responses using an online survey platform or through physical paper surveys.
Step 10: Data Monitoring	Monitor data collection progress regularly and address any issues with incomplete or inconsistent responses
Step 11: Data Cleaning	Clean the collected data by removing duplicate or incomplete responses, and check for outliers or illogical patterns
Step 12: Reliability of measures	Employ appropriate statistical techniques to examine the effectiveness and reliability of measures when analysing the data
Step 13: Consistency testing	Conduct validity checks, such as factor analysis or internal consistency testing, to ensure the data accurately represent the structure
Step 14: Statistical Analysis	Analyse cleaned data using appropriate statistical techniques to derive meaningful insights
Step 15: Reporting	Present the findings in a comprehensive report, ensuring transparency and discussing any limitations or biases

(Source: Tougaard & Jansson 1993; Padgett et al. 2012)

4.7.2 Data Collection Process

This research primarily examines the influence of organisational support on the EDP of SMEs, specifically emphasising the contributions of employees after receiving organisational support within SMEs. Therefore, the survey is directed at SME employees. The selection of participants is guided by inclusion criteria including the time needed to complete the questionnaire, geographic location, and their engagement in responding to the survey. Only those questionnaires that meet the rigorous research standards will be deemed valid for analysis (Yang et al., 2024). A detailed overview of the survey process is provided below. First, the directory of SMEs in China was obtained through open-source online databases available on the official website of China Statistical Information.

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The official websites for obtaining the lists of technology-based SMEs are as follows:

- Anhui Province, Sixth Batch: http://www.chinatorch.gov.cn/zxqyfw/c.
- Shanghai, Fourth Batch: https://stcsm.sh.gov.cn/cmsres.
- Guizhou Province, Fifth Batch: http://www.ctp.gov.cn/zxqyfw/c.
- Guangdong Province, Fourth Batch: http://www.ctp.gov.cn/zxqyfw/c.

This research found that Anhui province has 759 SMEs listed in the sixth batch of 2023 statistics; Shanghai has 2,532 SMEs listed in the fourth batch of 2023; Guizhou province has 507 SMEs included in the fifth batch of 2023; and Guangdong province has 1,231 SMEs listed in the fourth batch of 2023. Due to the extensive list, it has been stored in a cloud drive and is easily accessible: https://drive.google.com/drive/my-drive. In 2023, a total of 5,209 SMEs were identified across the four regions of China through various channels (Table 4.4).

Table 4.4 : Number of SMEs Listed in Four Areas

City/Province	No. of SMEs Listed in Four Areas
Guangdong	1231
Shang Hai	2532
Guizhou	507
Anhui	759

Subsequently, based on the lists of SMEs obtained from the four regions, purposive sampling was conducted. The sampling was aimed at ensuring the general applicability of the research conclusions.

Past studies commonly suggest that the responses the response rate for the prescribed sample size typically reach 100%, and sometimes can be lower than 40%. The findings

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indicated that the average response rates for questionnaire surveys 62.4% (the surveys of in-person/direct participation) and 38.9% (online surveys). Therefore, to address the issue of non-response or low level response rate, and ensure that sampling error is minimised, Bujang and Baharum (2017) proposed doubling the sample size by multiplying it by 2.

Based on the suggestion(Bujang et al., 2022), this research distributed the survey questions which was done through Social software(for example :WeChat and QQ /email) as follow;

First, distributed more than 1,000 questionnaires across the four selected regions. The aim is to achieve at least 400 valid responses to enhance the practicality and robustness of the study (Etikan, 2016). Second, during the data collection process, 15 SMEs engaged in digital transformation were purposefully selected in each region (Guizhou, Anhui, Shanghai, Guangdong). The specific names and inventory numbers of the surveyed SMEs are provided in Appendix D (Table 8.11). The data collection criteria are as follow:

1) The surveyed SMEs were verified by their respective managers and relevant personnel as technology-based SMEs operating within similar technological environments to ensure data reliability and validity (Wang et al.,2024). Previous research indicates that only SMEs involved in digital transformation and possessing a certain level of digital capabilities can achieve digital performance (Li et al., 2018; Vial, 2019).

2) SMEs must have at least 20 employees based on the definition of SMEs (Jia et al., 2020).

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The official definition of SMEs in China should be strictly followed to ensure that survey respondents meet the classification criteria, thereby avoiding interference from micro or large enterprises. According to the Regulations on the Classification of SMEs (Ministry of Industry and Information Technology, 2011, No. 300) (Jia et al., 2020; National Bureau of Statistics, 2023), enterprises are classified as follows:

- Medium-sized enterprises: 20–1,000 employees or annual revenue of 3 million to 400 million RMB.
- Small enterprises: 20–300 employees or annual revenue of 1 million to 300 million RMB.

This study obtained the survey sample from the SME directory. Additionally, prior to distributing the questionnaires, discussions were conducted with SME managers to verify the number of employees in the surveyed enterprises (Appendix D). Therefore, this study excludes micro-enterprises (with fewer than 20 employees), as they do not fall within the SME category. Large enterprises (with more than 1,000 employees) are also excluded, as they do not meet the SME criteria. Consequently, all respondents are ensured to be from SMEs with 20 to 1,000 employees.

Additionally, a screening question was added at the beginning of the questionnaire: "Does your enterprise qualify as an SME in China (with 20–1,000 employees)?" (Yes/No). If "No" is selected, the survey is terminated to ensure that the respondents meet the SME classification criteria. This approach enhances data accuracy, making the study findings more representative and scientifically valid.

This study also assessed the maturity level of digital development using the final dataset, which comprised 551 valid responses. The maturity level of each issue

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reported by each company pertains to the company's digital capability. Past research evaluated and differentiated six maturity levels (Durek et al., 2018). Levels 0 and 1 correspond to a relatively low degree of digital maturity in the enterprise; levels 2 and 3 correspond to a moderate degree of digital maturity in the enterprise; levels 4 and 5 indicate a relatively high level of digital maturity in the enterprise; and levels 5 and 6 indicate more mature levels of digital development.

Table 4.5 : The Scale of Digital Maturity Level

Dimensions	Measurement content	Digital maturity level
DML1	The enterprise you are affiliated with has sensed the significant advantages that digitisation brings to business growth.	—1—2—3—4—5—6—
DML2	Your organisation is developing a digital growth strategy and a digital development mindset.	—1—2—3—4—5—6—
DML3	Your organisation captures the growth potential of digitalisation	—1—2—3—4—5—6—
DML4	Do you think digital transformation in your organisation has facilitated resource management in your organisation?	—1—2—3—4—5—6—

Table 4.6 : Evaluation of Digital Maturity Level

Items	Minimum	Maximum	Mean	Std. Deviation
DML1	1	5	4.100	0.951
DML2	1	5	4.020	1.002
DML3	1	5	4.030	0.990
DML4	1	5	4.100	0.938

The survey results indicate that the overall digital development of the surveyed SMEs is quite mature (Mean > 4). Previous research indicates a significant correlation between the maturity of digital development and the generation of digital performance, with higher maturity levels leading to improved digital performance (Thordsen et al.,

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2020). The SMEs surveyed have engaged in digital development and thus, meet the objectives of this survey.

Before conducting the survey, this study obtained the contact information and industry details of the target enterprises from the SME survey directory. To enhance the response rate, this study engaged in thorough communication with the managers of the surveyed SMEs prior to the formal distribution of the questionnaire. This study provided a detailed explanation of the research objectives and offered appropriate incentives for completing the questionnaire. The survey was conducted only after obtaining the support and consent of the managers of the surveyed SMEs, thereby ensuring a high response rate.

In monitoring the responses and to ensure an adequate response rate, additional questionnaires were distributed when there were some non-return responses. In the end, a total of 300 questionnaires were distributed in each region, resulting in 1,200 questionnaires distributed in total. Ultimately, 800 participants completed the questionnaire, resulting in an approximate response rate of 66%. The collected 800 questionnaires underwent data cleaning and screening (Table 4.7) (Holtom et al., 2022). Invalid or incomplete responses were excluded, yielding a final dataset of 551 valid samples, thus providing a robust foundation for subsequent research.

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Table 4.7 : Data Screening and Cleaning Procedures

Step	Item	Processing Procedure
1	Duplicate Submissions	Identify and remove cases where the same respondent has submitted multiple questionnaires (detected via IP address, email, timestamp, or other unique identifiers).
2	Abnormal Completion Time	Calculate questionnaire completion time and exclude responses with excessively short (below a reasonable threshold) or overly long completion times.
3	Missing Key Responses	If critical variables (e.g., primary research variables) are significantly missing, consider excluding the questionnaire.
4	Handling Missing Values	If the proportion of missing values in key variables exceeds a certain threshold (e.g., 20%-30%), the questionnaire should be excluded.
6	Outlier Detection	Using Z-scores determine whether to remove or adjust them based on the research context.
9	Multicollinearity Test	Calculate the variance inflation factor (VIF) to ensure no severe multicollinearity among variables in regression models (VIF < 10).
10	Common Method Bias	Examine whether the questionnaire is affected by social desirability bias or common method bias.
11	Normality Test	Apply the Shapiro-Wilk or Kolmogorov-Smirnov test to ensure that the data distribution meets statistical analysis requirements, with log transformation or other data adjustments if necessary.

(Source: Based on established research procedures Holtom et al., 2022; Uher et al., 2022; Hair et al., 2017)

4.7.3 Validity and Reliability

Reliability is an assessment of the consistency among various measurements within a structure (Hair et al., 2014). Reliability explains the credibility of research results, indicating whether the findings can be replicated (Heale & Twycross, 2015). It is also described as the level of absence of error in the measurement scale (Cooper & Schindler, 2014).The quality of natural scientific and quantitative social science research depends on reliability and validity (Saunders et al., 2019). Research reliability involves repetition and consistency. Replicating a previous research strategy and getting consistent results displays research reliability (Saunders et al., 2019). Reliability encompasses the appropriateness of the measures used, the accuracy of the

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result analysis, and the generalisability of the findings (Saunders et al., 2019). This includes three perspectives. First, it assesses whether the measures employed in the research effectively capture the phenomenon under investigation and are suitable for their intended purpose. Second, it examines the accuracy of the result analysis and the relationships being proposed. Third, it examines the extent to which the research findings can be generalised (Saunders et al., 2019). When considering reliability, a distinction is sometimes made between internal reliability and external reliability. Internal reliability ensures consistency during the research project. External reliability pertains to whether your data collection techniques and analysis procedures would yield consistent results if repeated on other occasions or by different researchers (Saunders et al., 2019). Research achieves internal validity when it effectively establishes a causal relationship between two variables. The concept of external reliability pertains to the inquiry of whether the results of a study can be applied to other pertinent situations or groups (Saunders et al., 2019).

In this study, the social science statistical package (SPSS 26) and Structural Equation Modelling (SEM) were used to analyse data collected (Henseler et al., 2014). SPSS was utilised for data preparation, editing, coding, handling of missing data, outlier analysis, and descriptive and inferential statistics for common method bias analysis. The SEM is a second-generation multivariate analysis technique that combines factor analysis and path analysis, allowing researchers to simultaneously test and estimate relationships among multiple exogenous and endogenous variables with multiple indicators (Kirby & Bollen, 2009). In addition, the SEM was utilised for the reflective measurement model. This model presents internal consistency reliability, convergent validity, and discriminant validity. The analysis of the measurement model aims to

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assess the relationships between items and constructs as well as to evaluate the interrelationships among constructs (Jr et al., 2017).

Thus, it reflects researchers' confidence in the information collected using a specific research instrument (Creswell, 2014). Some commonly used methods for assessing the reliability of instruments include internal consistency and test-retest correlation (Creswell, 2014; Dijkstra et al., 2014). Test-retest reliability determines whether there is a correlation between scores obtained from the same group of individuals when the same questionnaire is administered on multiple occasions, while internal consistency measures the similarity of all items that should measure a construct and whether they are consistent when measuring that construct (Creswell, 2014; Dijkstra et al., 2014). To determine the Cronbach's alpha (a widely used reliability indicator) in this study, Given this, the current study used Cronbach's alpha, commonly employed in SEM research, to evaluate the reliability of the research instrument (Hair et al., 2017). Composite reliability testing was also conducted to address the weakness of relying solely on Cronbach's alpha to measure the overall reliability of the entire set of items measuring each construct (Hair et al., 2017).Cronbach's alpha represents the extent of correlation that occurs among several items measuring a construct (Creswell, 2014). While the literature suggests that correlation coefficients of 0.7 or higher are considered acceptable (Hair et al., 2017). Moreover, the average variance extracted (AVE) and composite reliability (CR) were used to assess the reliability of the research instrument (Cooper & Schindler, 2014; Cronbach, 1951). Good data result from instruments that are valid and reliable. Here are the detailed descriptions of each variable (Kirby & Bollen, 2009). The criteria for evaluating the measurement model are presented in Table 4.3.

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Table 4.8 : Measurement Model Analysis Criterion Using AMOS

Test	Index Name	Acceptance Level	Literature Support
Reliability	Internal consistency	Cronbach Alpha > 0.7 Composite Reliability>0.708	Hair et al. 2014 Hair et al. 2014
Convergent Validity	Average Variance Explained	AVE score > 0.50 Loading for indicators > 0.70	Hair et al., 2014 Fornell &Larcker (2008)
Discriminant Validity	Cross-Loading Assessment	Cross-loadings by 0.1	& Wang (2010)
	Criterion	AVE > r2	Hair et al (2010)
	HTMT criterion	HTMT 0.85 HTMT 0.90 HTMT inference	Hair et al. (2010). Henseler et al. (2014)

(Source: Hair et al., 2017

Furthermore, in the measurement model, the goodness-of-fit test also examines the validity and reliability of the measurement model(Hair et al., 2017).The measurement model primarily elucidates the interactions between observed variables and latent variables (Jackson et al., 2009).When assessing the goodness of fit of the measurement model, model fit indices are crucial. Two criteria are used to judge the model fit: similarity and dissimilarity. Similarity Criteria for Model Fit Indices: Generally considered satisfactory if greater than 0.9. Acceptable between 0.8 and 0.9. Examples include GFI, AGFI, CFI, TLI, and NFI.

4.7.4 Measurement of Variables

According to Saunders et al. (2019), the quality of assessment tools can be evaluated using the following criteria: the instrument must be up-to-date, widely cited by scholars, has undergone document review, and able to provide information on reliability and validity scores from previous literature. Other criteria relate to how well

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data collection procedures align with the research questions and hypotheses, and whether the instruments include recognised scales.

All variables in this study were assessed using the original Likert scales, ranging from "Strongly Disagree" to "Strongly Agree," with five or seven response options. The following table outlines the research instruments and their respective measurement scales. Construction of Likert scales was employed to measure the concepts.

Table 4.9 : Summary of Measurement Scale

Latent Variable	Sample Items	CR	Source	Items / Scales
Competitive climate	My coworkers frequently compare their results with mine.	0.75	(Wang et al., 2018)	16 items (5-Likert scale)
Employee dynamic capability	I quickly notice and successfully recognise in the environment (both inside and outside of the organisation) opportunities and threats (including early warning signals) that can affect the work I do.	0.902	(Bieńkowska & Tworek, 2020)	5 items (5-Likert scale)
Employee digital performance	I find solutions to work problems after performing analytics with the big data generated by smart/digital technologies.	0.802/0.815	(Shao et al., 2022)	6 items (5-Likert scale)
Digital leadership	The leaders in our company recognise the network character by identifying the competencies and contacts of individual employees.	0.940	(Borah et al., 2022)	6 items (5-Likert scale)
HI-HMP	Employees at this plant have skills that are above average in this industry.	0.949	(Rubel et al., 2017)	13 items (5-Likert scale)
Digital capability	Acquiring important digital technologies.	0.905	(Khin & Ho, 2019)	5 items (5-Likert scale)
Organisational learning	Our organisation encourages employees to	0.944	(Li &Wang,2022;	5 items

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Table 4.9 : Continued

	attend training sessions to acquire new knowledge.	Mollah et al., 2023)	(5-Likert scale)

4.8 Pre-Testing and Pilot Test

Pre-testing research instruments is strongly encouraged to strengthen research tools before distributing them to respondents. Pre-testing allows the questionnaire to fulfil its intended purpose and ensures that respondents have a clear understanding of the survey (Saunders et al., 2019), and it helps to identify weaknesses in the questionnaire design (Malhotra & Birks, 2007). Researchers could consult with experts, clarify any ambiguous areas, and avoid misunderstandings and misinterpretations of the questions (Saunders et al., 2019).

The pre-testing of the questionnaire for this study was conducted by sending the sample to HR Managers in the SMEs and a lecturer from the School of Business and Economics and Management, Universiti Putra Malaysia (UPM). Members of the review panel were chosen based on their expertise in research skills and knowledge in the field of management. They reviewed the questionnaire design, layout, sequencing, wording, and language usage. This process is crucial for assessing face and content validity. Based on the feedback provided by the panel members, modifications were made to the questionnaire.

A pilot study, alternatively referred to as a pilot test or feasibility study, is a preliminary inquiry of limited scale carried out during the initial stages of a major research project(Hair et al., 2017). It involves testing the research design, methods,

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instruments, and procedures to identify any potential issues or challenges and make necessary adjustments before conducting the full-scale study (Padulo et al., 2019).

Firstly, a pilot study allows researchers to assess the feasibility and practicality of their research design. This helps identify any flaws or limitations in the chosen methodology and provides an opportunity to refine the research design to ensure its effectiveness (Padulo et al., 2019). Secondly, it assists in predicting and determining potential problems or challenges that may arise during the main study. This includes issues related to data collection, participant recruitment, instrumentation, or data analysis. By identifying these problems early on, researchers can develop strategies to address them and ensure the smooth execution of the main study (Padulo et al., 2019).

A pilot study is an important preparatory step for a larger research project. It helps researchers identify and address potential issues, ensure the feasibility of the research design, and improve the quality and efficiency of data collection (KiRaz et al., 2020). The insights gained from a pilot study contribute to the overall validity and reliability of the main study's findings. The purpose of conducting a pilot study is to identify weaknesses of the instrument in the current study and address them before the full implementation(Hair et al., 2017). A pilot study also helps estimate costs and determine the budget for data collection and analysis.

To conduct a pilot study, Lackey and Wingate (1998) recommend including 10% of the target population, while Hertzog (2008) suggests using a sample size of 35-40 for a pilot study. The pilot study for this research followed the methodology suggested by Lackey and Wingate (1998). A total of eight SMEs in the four Chinese regions were

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selected, selecting two from each region. According to Hooper et al. (2008), the minimum requirement for the sample size is at least 400 respondents. Under the requirement to target 10% of respondents, this study selected 40 samples for the pilot test. A reliability test was conducted on the pre-test questionnaire, which also met the standards set by Hertzog (2008). According to Nunnally's (1978) established criteria, structural measurement values with reliability test thresholds (Cronbach's Alpha >= 0.65) are considered acceptable, and reliability and validity testing should be conducted during the measurement model analysis phase to examine the validity and reliability of the research structure. For this study, the researcher collected questionnaires through a combination of online methods. Subsequently, using IBM SPSS Statistics version 26.0, the collected data were analysed to obtain Cronbach's Alpha values. According to Leech and Onwuegbuzie (2008), a reliability coefficient exceeding 0.7 is favourable. The Cronbach's Alpha coefficients for each section of the survey ranged from 0.898 to 0.972, indicating excellent internal consistency. The results of Cronbach's Alpha coefficients suggest that the reliability of course satisfaction is acceptable and high (0.86). Additionally, the Alpha values for each subscale are deemed acceptable. The table below presents the reliability results of Cronbach's Alpha for the pilot study. Data gathered from the pilot study show that the α coefficient for the instrument in this research exceeds 0.7; therefore, the questionnaire is deemed suitable for practical use in the actual study (Table 4.6).

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Table 4.10 : Cronbach's Alpha Internal Consistency Reliability for the Instruments

Variables	α Pilot Test	α Actual Study
Digital Leadership (DL)	0.936	0.948
Digital Capability	0.970	0.972
HI-HRMP	0.954	0.971
Organisational Learning (OL)	0.928	0.944
Competitive Climate	0.904	0.898
Employee Dynamic Capability (EDC)	0.968	0.970
Employee Digital Performance (EDP)	0.952	0.958

4.9 Chapter Summary

This study is grounded in a positivist worldview and is guided by quantitative methods. The research aims to validate the research framework and has chosen four representative regions in China (Shanghai, Guangdong, Anhui, and Guizhou) as the scope of the survey. Based on the research questions and objectives, the inclusion criteria for the survey target respondents are employees of SMEs involved in digital transformation. A questionnaire survey was conducted among employees of SMEs within the selected regions. The measurement of all latent variables in the study was adapted and modified from previous research scales. A pilot study was conducted within SMEs (40 samples) to enhance the reliability of the questionnaire, and the instruments used. Purposive sampling was employed during the data collection process, and data analysis was conducted using Structural Equation Modelling (AMOS).

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CHAPTER 5

DATA ANALYSIS AND RESULTS

5.1 Introduction

This study utilised the combination of SPSS 26 software and AMOS for descriptive and regression analyses of the research questions. The use of this software facilitated a more straightforward analysis of the data, allowing the researcher to determine whether the proposed hypotheses received support. In this chapter, the specific procedures for data collection and the steps involved in data analysis are elaborately discussed. Subsequently, the data cleaning process is introduced, followed by confirmatory factor analysis and descriptive statistics. A goodness-of-fit test then was performed on the entire measurement model. Finally, the proposed path relationships stated in the hypotheses were analysed using the structural equation modelling, along with the examination of the intermediary model. Ultimately, the measurement results were obtained.

5.2 Data Analysis

Data analysis is commonly perceived as the process of simplifying data to make it more comprehensive (Mendillo et al., 2012). It is essential to meticulously analyse the details of data collection to ensure that the data gathered can address the research questions or hypotheses. This study aims to explore the direct or indirect impact of OSV (DL, DC, HI-HRMP, and OL) on EDP in Chinese SMEs. EDC serves as the mediating variable, with CC as the moderating variable. Researchers analysed the collected data, beginning with the use of SPSS software to generate descriptive statistical data, including frequencies, maximum and minimum values, standard

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deviations, percentages, and means, to describe and interpret demographic information (gender, age, education level, and employee count). In other instances, relationships between variables will be established as this is a fundamental requirement of SEM. It is imperative to demonstrate significant relationships among the variables in the study. A correlation coefficient reaching 0.50 is considered sufficient to meet SEM assumptions (Green, 1991), and SEM was employed to investigate the correlations between the variables. The table below outlines the primary research steps of this chapter.

Table 5.1 : Data Analysis Steps

Analysis steps	Statistical Analysis Employed
Step 1	● Data screening
Step 2	● Description analysis
Step 3	● Confirmatory factor analysis
Step 4	● Reliability and validity
Step 5	● Measurement model
Step 6	● Structural equation model
Step 7	● Analysis results

5.2.1 Data Screening

5.2.1.1 Introduction

Differences exist in the way respondents answer questionnaire items due to their level of attention to the tools. However, researchers can enhance the rigour of the analysis and improve the credibility of the research results by employing data filtering to identify those who may not have exerted sufficient effort (DeSimone et al., 2015). Nevertheless, data filtering procedures vary in application and complexity to identify specific low-quality response patterns. According to Hair Jr et al. (2014), data filtering is prepared for research data used in statistical analysis, and to ensure the usefulness,

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reliability, and validity of the data, it is essential to carefully filter the data (DeSimone et al., 2015). This study filtered the data by addressing missing values, addressing multicollinearity, and handling inferential outliers.

5.2.1.2 Normality Test

When calculating variance, statistics assumes normality, the fundamental probability distribution. Kurtosis, skewness, Kolmogorov, and Shapiro tests analyse data normalcy using statistical means (Hair Jr et al., 2014; Joshanloo & Jovanović, 2017). In this study, the normality test results for all items in the computational model serve as the primary assumption. The results suggest that the skewness and kurtosis values for all items are within the range of ±2, indicating a normal distribution. All components of the Skewness fall within the range of -2 to +2 (-1.171 – -.041), and for kurtosis, the data is considered normal if kurtosis falls within the range of – 7 to +7 (-1.843 – .184).

Table 5.2 : Normality Test

Dimensions	Items	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
DL	DL1	1	5	3.990	0.920	-0.589	-0.213
	DL2	1	5	4.100	0.911	-0.701	-0.112
	DL3	1	5	4.100	0.902	-0.758	0.016
	DL4	1	5	4.150	0.882	-0.769	-0.046
	DL5	1	5	4.080	0.973	-0.949	0.510
	DL6	1	5	4.150	0.910	-0.977	0.657
DC	DC1	1	7	5.440	1.461	-0.686	-0.127
	DC2	1	7	5.420	1.500	-0.651	-0.354
	DC3	1	7	5.370	1.522	-0.551	-0.592
	DC4	1	7	5.130	1.654	-0.459	-0.759
	DC5	1	7	5.310	1.570	-0.559	-0.527
HI-HRMP	HCD1	1	5	4.110	0.887	-0.627	-0.489
	HCD2	1	5	4.030	0.952	-0.709	-0.068
	HCD3	1	5	3.970	1.066	-0.890	0.175
	HCD4	1	5	4.100	0.952	-0.818	0.022
	HEM1	1	5	4.010	0.914	-0.602	-0.193
	HEM2	1	5	4.000	0.920	-0.540	-0.388
	HFR1	1	5	3.970	0.952	-0.642	-0.174
	HFR2	1	5	3.980	0.932	-0.640	-0.151
	HFR3	1	5	4.010	0.923	-0.644	-0.137

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Table 5.2 : Continued

	HIS1	1	5	4.080	0.887	-0.620	-0.412
	HIS2	1	5	4.050	0.877	-0.554	-0.391
	HRE1	1	5	4.110	0.860	-0.759	0.272
	HRE2	1	5	4.100	0.887	-0.750	0.088
	HRE3	1	5	4.150	0.852	-0.870	0.643
	HOT1	1	5	4.030	0.905	-0.696	0.051
	HOT2	1	5	4.090	0.919	-0.747	0.052
	HOT3	1	5	4.050	0.910	-0.656	-0.244
	HOT4	1	5	4.000	0.944	-0.651	-0.159
	OL1	2	5	4.200	0.815	-0.641	-0.490
	OL2	2	5	4.180	0.832	-0.590	-0.661
OL	OL3	1	5	4.190	0.823	-0.668	-0.230
	OL4	1	5	4.160	0.866	-0.762	-0.133
	OL5	1	5	4.200	0.848	-0.784	-0.020
	CC1	1	5	3.870	1.024	-0.634	-0.093
CC	CC2	1	5	3.930	0.968	-0.591	-0.157
	CC3	1	5	4.170	0.873	-0.790	0.083
	CC4	1	5	3.890	1.013	-0.579	-0.334
	EDC1	2	7	5.430	1.311	-0.248	-1.043
	EDC2	1	7	5.360	1.320	-0.180	-0.956
EDC	EDC3	1	7	5.360	1.336	-0.230	-0.869
	EDC4	1	7	5.360	1.361	-0.355	-0.645
	EDC5	1	7	5.320	1.369	-0.311	-0.739
	EDC6	1	7	5.530	1.299	-0.396	-0.741
	EDP1	1	5	4.040	0.865	-0.578	-0.076
	EDP2	1	5	4.050	0.890	-0.678	0.059
EDP	EDP3	1	5	4.070	0.858	-0.633	0.038
	EDP4	1	5	4.050	0.864	-0.600	-0.042
	EDP5	1	5	4.040	0.866	-0.672	0.221
	EDP6	1	5	4.080	0.846	-0.735	0.365

5.2.1.3 Removal of Outliers

The first step in preparing the data is to identify outliers. In collective data, portions of data that significantly differ from the rest should be distinguished and treated as outliers. According to Osborne and Overbay (2004), outliers may stem from various reasons, including human errors in data collection, recording, and input. However, outliers are often present in large samples, implying that with normal and large data, it is expected that 1% of the sample will exceed three standard deviations from the mean (Sullivan et al., 2021).

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Univariate outliers are defined by considering the frequency distribution of Z-scores of observed data (Kline, 2005). However, no univariate outliers were found in this dataset as the 5-point and 7-point Likert scales ranging from 1 to 5 to 7 were used in this study. For input variables, univariate assessments (histograms, boxplots, and standardised Z-scores) were employed to evaluate outliers. According to Hair et al. (2017), for large samples, an absolute value of $Z > 4$ indicates extreme observations. The results showed that the standardised scores for input variables ranged from -2.901 to 2.491, indicating that none of the input variables exceeded this threshold (Hair et al.,2017).

To identify multivariate outliers, Mahala Nobis distance (D^2) was used, which represents the number of standard deviations an observation is from the mean of all observations. Multivariate testing was performed, indicating that all observations could be retained.

5.2.1.4 Multi-Collinearity

Structural Equation Modelling (SEM) is a robust modelling method for predicting variable sets with multicollinearity. Multicollinearity is not significant when two or more variables are independent (Bonsa & Ivatury, 2022). However, when predictive factors are interdependent, the model results poorly and can be misleading. High multicollinearity, indicating a very high correlation between predictive factors, can pose issues in multivariate analysis, potentially leading to biased standard errors and coefficient estimates (Niemelä-Nyrhinen & Leskinen, 2014). High multicollinearity is considered when the correlation between variables exceeds 0.85. Correlation coefficients between variables were examined and found to be below 0.8 (Appendix

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C), indicating the absence of multicollinearity issues. VIF (Variance Inflation Factor) was calculated using SPSS 22 software, and the results revealed that all variables were below 10 (Bonsa & Ivatury, 2022).

5.2.1.5 Model Specification

Once the measurement model is developed, it needs to be standardised into the structural model, which is the formal "design" of the model reflecting a priori assumptions about the measurement model (Costa & Sarmento, 2023). To achieve this, it is necessary to adhere to certain rules. Common latent factors lead to observable variables as the behaviour of observable variables is a manifestation of latent factors (Ringle & Hair, 2021). Specific latent factors explain the variance in observable variables that is not defined by common latent factors, such as measurement errors. Measurement errors are typically independent (though they may be correlated, indicating a source of co-variation among elements not explained by common factors in the model (Costa & Sarmento, 2023).

5.3 Descriptive Analysis

Age distribution of respondents is crucial for understanding intergenerational differences in the adoption of digital technology (Wu et al., 2022). Young employees may be more familiar with digital technology and may have different attitudes and approaches compared to the older generation. Examining the educational background of the respondents helps gauge their digital literacy and technological knowledge (Wu et al., 2022). Higher levels of education may indicate a greater likelihood of understanding and accepting the strategies and technologies of digital transformation. Assessing the digital readiness of Chinese SMEs involves examining their current

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digital infrastructure, online presence, and the usage of digital tools and platforms. This characteristic helps determine the level of preparedness and specific challenges faced by SMEs in the process of digital transformation (Su et al., 2023). By studying these demographic characteristics within the context of Chinese SMEs, valuable insights can be gained regarding the factors influencing digital transformation across different regions, industries, and company sizes (Liu & Yu, 2021).This understanding can provide information for policymakers, industry associations, and the enterprises themselves to formulate targeted strategies, policies, and support mechanisms to facilitate and accelerate the process of digital transformation for Chinese SMEs (Liu et al., 2018).

Based on the demographic profile, most participants (74.23%) were male. 59.71% of the participants were aged between 18 and 25, 15.61% aged between 26, and 30, 23.41% aged between 31 and 50, and 1.27% were in the 51 to 60 age brackets. Just under 2% of the participants were enrolled in high school, while 9.26% had successfully finished high school. Approximately 74.23% of the respondents had obtained a bachelor's degree, and 15.06% had obtained a master's degree. Among the surveyed SMEs, the number of employees in the surveyed SMEs ranged from 20 to 300 in 16.7% of the cases, and from 300 to 1,000 in 83.30% of the cases. According to the established criteria for SMEs in China, the sample fully corresponds to the goals of this survey (Table 1).

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Table 5.3 : Sample Descriptive Statistical Analysis

Basic facts	Categories	Frequency	Percent	Valid Percent	Cumulative Percent
Gender	Male	409	74.23	74.23	74.23
	Female	142	25.77	25.77	100.00
Age	18~25	329	59.71	59.71	59.71
	26~30	86	15.61	15.61	75.32
	31~40	109	19.78	19.78	95.10
	41~50	20	3.63	3.63	98.73
	51~60	7	1.27	1.27	100.00
Education	Middle School below	3	0.54	0.54	0.54
	Middle School	5	0.91	0.91	1.45
	High school	51	9.26	9.26	10.71
	Bachelor	409	74.23	74.23	84.94
	Postgraduate students	83	15.06	15.06	100.00
No of employees	20 employees ＜300 employees	386	70.06	70.06	70.06
	300 employees ＜1000 employees	165	29.94	29.94	100.00
	Total	551	100.0	100.0	

5.4 Confirmatory Factor Analysis (CFA)

Data analysis in this study utilised Structural Equation Modelling (SEM) as the primary statistical technique. Confirmatory Factor Analysis (CFA), the initial step in SEM data preparation, serves multiple key purposes, including evaluating model fit, assessing convergent validity, and determining construct reliability. The primary objective of model fit testing is to assess the fit indices of the items as well as the individual factor loadings (Hair et al., 2017). The measurement model primarily elucidates the interactions between observed variables and latent variables (Jackson et al., 2009). Moreover, when assessing the goodness of fit of the measurement model, model fit indices are crucial. Table 5.4 summarises the fit indices for the measurement model.

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Basic Assumptions: The sample covariance matrix does not significantly differ from the model covariance matrix.

Two criteria are used to judge the model fit: similarity and dissimilarity(Hair et al., 2017).

Similarity Criteria for Model Fit Indices: Generally considered satisfactory if greater than 0.9. Acceptable between 0.8 and 0.9. Examples include GFI, AGFI, CFI, TLI, and NFI.

Two indicators of model anisotropy: Generally considered acceptable if less than 0.08, or stricter, if less than 0.05. Examples include RMSEA and SRMR. Chi-square/DF should be less than 3 (Iacobucci, 2010). The table below presents the detection standards for various fit indices.

Table 5.4 : Fit Indices and Recommended Values

Fit indices	Recommended values	Authors
Relative Chi-Square (χ^2/df)	≤5.00 (if n>200)	Hair et al. (2010)
GFI	≥0.90	Chau (1997); Hair et al. (2010)
AGFI	≥0.80	Chau and Hu (2001)
CFI	≥0.90	Hair et al. (2010)
NFI	≥0.90	Chau (1997)
TLI	≥0.90	Hair et al. (2010); Ho (2006)
IFI	≥0.90	Hair et al. (2010); Ho (2006)
RMSEA	≤0.08	Byrne (2001)
	≤0.10	Schumacher & Lomax (2010)
AVE	≥0.50	Hair et al. (2010)
CR	≥0.70	Hair et al. (2010)

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5.4.1 CFA for Digital Leadership

Figure 5.1 examines six DL fit factors. Analysis shows a significant structural model-data alignment. The structural equation model analysis used maximum likelihood estimation, and the data and model fit indices are: χ^2 (550) = 29.807, CMIN/DF = 4.258, CFI = 0.992, AGFI = 0.946, IFI = 0.992, RMSEA = 0.077, TLI = 0.984. All major fit indices exceed 0.9. The proposed attitude-behaviour correlation model appears conceptually and practically robust. The main fit indices are above or close to 0.9, indicating a satisfactory fit. The model fit is good(Hair et al., 2017).

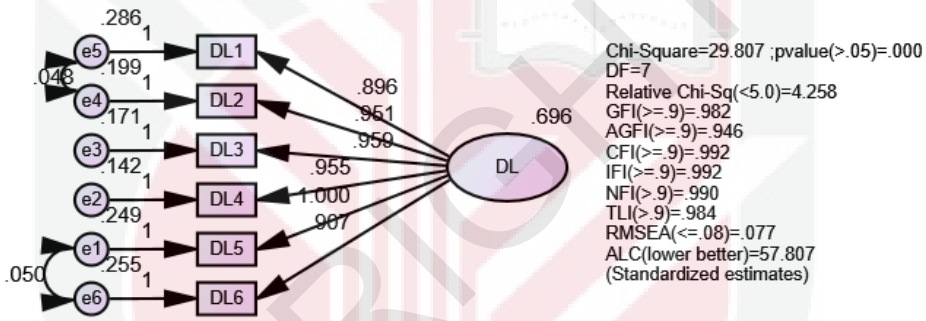

Figure 5.1 : Model Fit for Digital Leadership

5.4.2 CFA for Organisational Learning

Figure 5.2 examines the goodness of fit for OL, which consists of five elements. The analytical findings demonstrate that the structural model and the data have a good fit. Maximum likelihood estimation was used to examine the structural equation model, and the fit indices for the data and model are as follows: χ^2 (550) = 5.699, CMIN/DF =1.425, CFI = 0.999, AGFI = 0.985, IFI = 0.999, RMSEA = 0.027, and TLI = 0.998. All key fit indexes are above or near 0.9. These findings indicate that the proposed attitude-behaviour correlation model is strong, both conceptually and practically. The

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primary fit indices are all more than or equal to 0.9, indicating a satisfactory level of fit. The model exhibits an excellent overall fit (Hair et al., 2017).

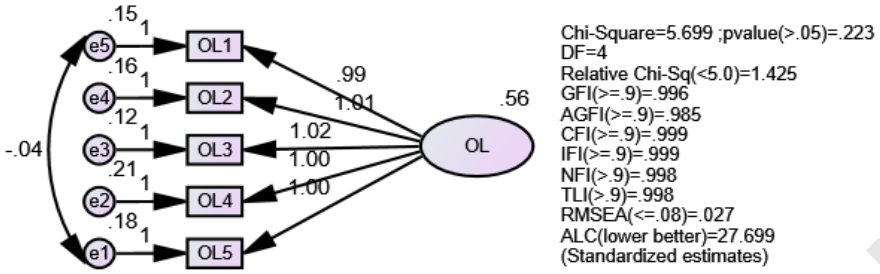

Figure 5.2 : Model Fit for Organisational Learning

5.4.3 CFA for Digital Capability

Figure 5.3 examines the goodness of fit for DC, which consists of five components. The analytical results show a strong fit between the structural model and the data. The structural equation model was analysed using maximum likelihood estimation, and the fit indices for the data and model are as follows: χ^2 (550) = 6.914, CMIN/DF = 2.305, CFI = 0.999, AGFI = 0.975, IFI = 0.999, RMSEA = 0.049, and TLI = 0.997. All key fit indexes are above or near 0.9. These findings indicate that the proposed attitude-behaviour correlation model is strong both conceptually and practically. The primary fit indices are all more than or equal to 0.9, indicating a satisfactory level of fit. The overall fit of the model is superb (Hair et al., 2017).

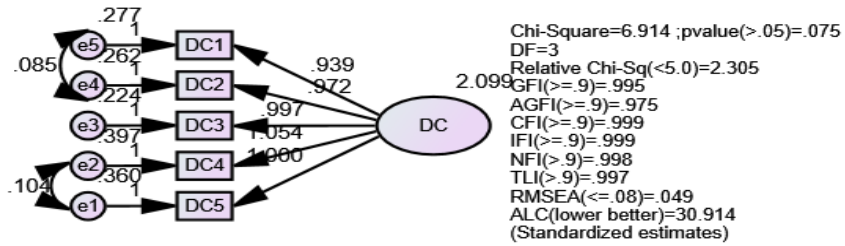

Figure 5.3 : Model Fit for Digital Capability

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5.4.4 CFA for HI-HRMP

When a second-order model has four or more first-order factors, the chi-square value for the second order will be greater than the chi-square value for the first order. The target coefficient is used to assess whether the first-order model can be simplified into a second-order model. The target coefficient is calculated as the chi-square value associated with the first-order factors is divided by the chi-square value of the second-order model. The reference standard is that the closer the target coefficient is to 1, the more efficient the simplification is (Marsh, 1990).

To simplify the model and reduce the estimated parameters of the structural equation model, a second-order model was constructed, with the first order consisting of six factors and the second order synthesising HI-HRMP. The ratio of the first-order six factors to the second order is 90.5%, resulting in a target coefficient of 0.908. Following Marsh's (1990) suggestion, the closer the target coefficient is to 1, the better it is. Therefore, the second-order model in this study is deemed acceptable (Marsh, 1990). This study employs a hierarchical model to depict the overall impact of HI-HRMP. HI-HRMP is conceptualised as a hierarchical (second-order) reflective structure, based on the replicative indicator technique utilised in earlier studies across various domains (Rubel et al., 2018). In this approach, the first-order factors (capability development, empowerment, information sharing, involvement, and recognition) and their respective indicators are modelled as a second-order structure (HI-HRMP). This structure is directly measured by indicators from all first-order factors (Wetzels et al., 2009). This study used CFA of the first order (Figure 5.4) and the second order (Figure 5.5) to decide fitness with the data. The T value that is closer to 1 implies that the second-order CFA can replace the first-order CFA, making the

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model more precise. The T value of HI-HRMP is 0.99, which is close to 1 in this study. The fitness index of second-order CFA of HI-HRMP indicates the fitness is good. Therefore, this study takes the results of second-order CFA to implement structural model analyses: T=343.217/364.824=94.7%.

Therefore, this study is suitable for second-order factor analysis as it employs a hierarchical (second order) reflective structure to conceptualise HI-HRMP. The first-order factors (capability development, empowerment, information sharing, involvement, and recognition) are modelled as sub-dimensions of the second-order factor (HI-HRMP), allowing for an analysis that captures the overall impact of HI-HRMP on the underlying factors. The use of a second-order structure facilitates a comprehensive examination of the interrelationships among the first-order factors, providing a more nuanced understanding of the underlying constructs and their collective influence on the overall HI-HRMP concept.

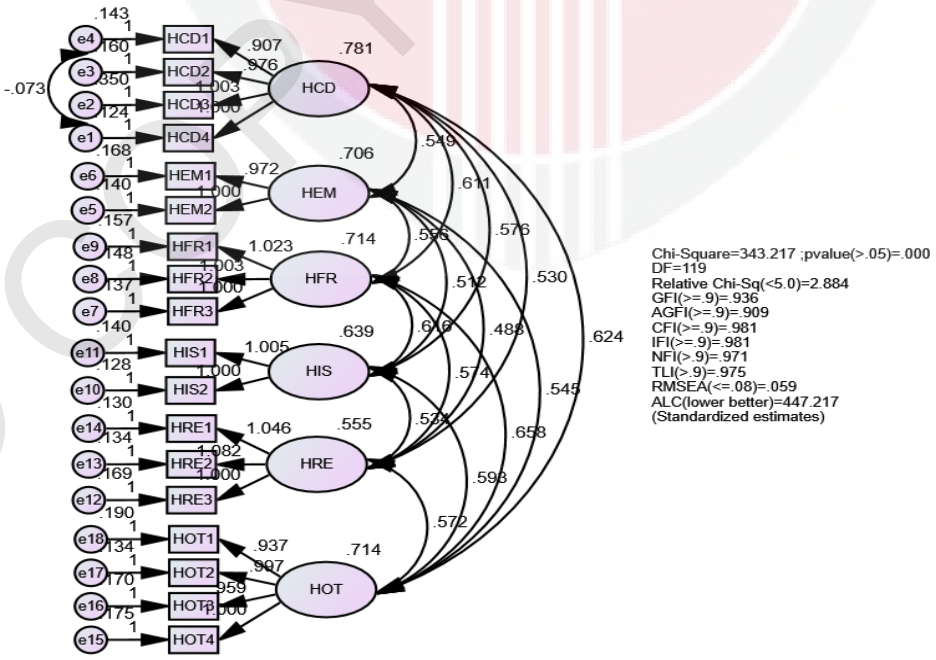

Figure 5.4 : First-Order Configuration

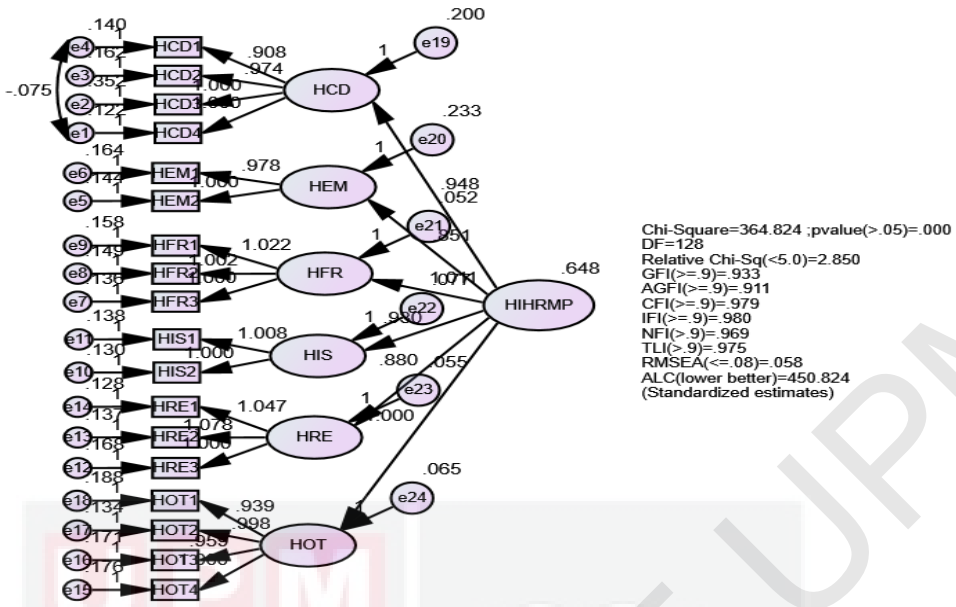

Figure 5.5 : Second-Order Model

5.4.5 CFA for employee dynamic capability

Figure 5.6 analyses the goodness of fit for EDC, which is composed of six items related to EDCs. Analysis shows a good fit between the structural model and data. The data and model fit indices for the structural equation model were calculated using maximum likelihood estimation: χ^2 (550) = 20.092; CMIN/DF = 2.870; CFI = 0.997; AGFI = 0.965; IFI = 0.997; RMSEA = 0.058; CFI = 0.997; TLI = 0.993. All key fit indexes are above 0.9. These findings indicate that the proposed EDC correlation model is strong both conceptually and practically. The primary fit indices are all more than or equal to 0.9, indicating a satisfactory level of fit. The overall fit of the model is excellent (Hair et al., 2017).

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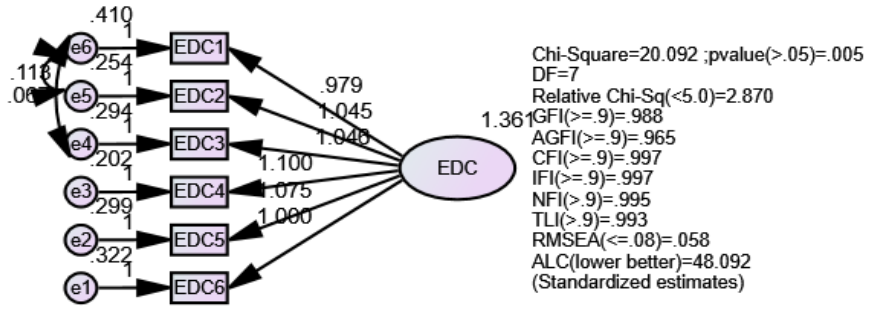

Figure 5.6 : Model Fit for Employee Dynamic Capability

5.4.6 CFA for Employee Digital Performance

There are six items in Figure 5.7 that look at the goodness of fit for EDP. The study shows that the structural model and data are very well aligned. For the structural equation model study, maximum likelihood estimation was used. These are the fit indices for the data and model: The values of χ^2 (550) =17.990, CMIN/DF=1.999, CFI =0.997, AGFI=0.975, IFI=0.997, RMSEA =0.043, CFI=0.997, and TLI =0. 996. All fit are above 0.9. Based on these findings, the proposed EDP correlation model seems to work well both in theory and in practice. There is a good amount of fit since all the major fit indices are above or close to 0.9. The model fits very well all around.

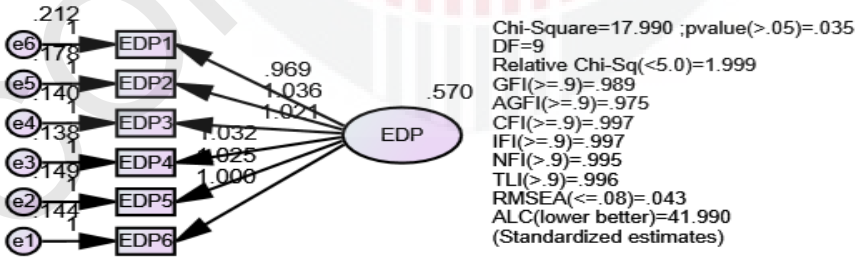

Figure 5.7 : Model Fit for Employee Digital Performance

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5.4.7 CFA for Competitive Climate

Figure 5.8 shows the four-item goodness-of-fit for CC. Analysis shows a significant structural model-data alignment. The structural equation model analysis used maximum likelihood estimation, and the data and model fit indices are: χ^2 (550) = 0.955, CMIN/DF = 0.955, CFI = 1.000, AGFI = 0.991, IFI = 1.000, RMSEA = 0.00, TLI = 1.000. All major fit indices exceed 0.9. The proposed attitude-behaviour correlation model appears conceptually and practically robust. The main fit indices are above or close to 0.9, indicating a satisfactory fit. The model fit is great (Hair et al., 2017).

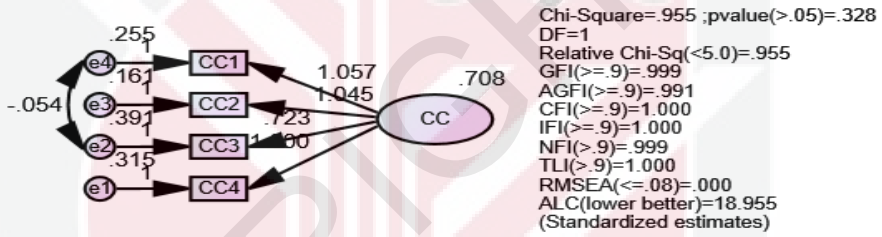

Figure 5.8 : Model Fit for Competitive Climate

5.5 Reliability and Validity

This study employed individual confirmatory factor analysis (CFA) using the first-order CFA. The initial output did not meet the requirements, and adjustments were made based on the recommendations of modification indices to meet the criteria. All constructs are displayed in Table 5.4, and the CFA for all constructs adheres to the specified procedure. More specifically, CFA is a technique that seeks to confirm whether the number of factors (or constructs) and the loadings of observed (indicator) variables align with the expected theoretical foundations (Shek & Yu, 2014). To confirm and precisely grasp how observed variables represent the structure, the scale's

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reliability and validity must be assessed. Cronbach's Alpha, which evaluates reliability and internal consistency, is the most popular. The widely accepted rule for describing internal consistency is using Cronbach's Alpha (Brown & Moore, 2012). In CFA, it is essential to explore the two types of models: the measurement model and the structural model.

The measurement model refers to the relationships between construct measurements, indicators, and constructs intended to measure factors. By examining three key sets of results (parameter estimates, fit indices, and potential modification indices), researchers can formally test measurement hypotheses and adjust them to better align with the actual response structure of the scale participants. Therefore, it is crucial to start by defining the measurement model (Brown & Moore, 2012). Moreover, researchers must start by specifying at least three fundamental aspects of the measurement model. First, they need to determine the number of latent factors or variables (represented by ellipses) hypothesised under the scale elements (represented by rectangles). Second, they must specify the elements associated with each factor, with at least one element linked to each factor, and each element correlate with a single latent variable. Third, if the assumed model involves multiple factors, researchers must specify the potential associations between these factors (Jackson et al., 2009).

After establishing the measuring model, the factors' reliability and validity were examined. Cronbach's alpha exceeds 0.892 on each scale, indicating good internal consistency. Composite Reliability (CR) measures construct indicator internal consistency by combining all measurement item reliabilities. Higher CR values indicate construct internal consistency, with 0.7 considered acceptable (Hair Jr et al.,

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2014). AVE determines latent variable average explanatory power for measurement indicators. Higher AVEs indicate convergence. It should be more than 0.5, and 0.36-0.5 is good (Fornell & Larcker, 1981). In Table 5.5, Composite Reliability values vary from 0.902 to 0.972, with AVE scores ranging between 0.699 and 0.873. These values exceed the specified 0.70 and 0.50 critical levels. These results prove the measuring model's discriminant validity and reliability. Convergent validity evaluates construct-related item convergence on the latent construct. Factor loadings for each construct are significant ($p < 0.001$) and above the 0.50 criterion. The factor loadings are substantial ($p < 0.001$), with z-values over 1.96 (range: 16.868 to 30.038).

Table 5.5 : Reliability and Validity

Dimensions	Items	Unstd.	S.E.	C.R.	P	Std.	Cronbach's	CR	AVE
HI-HRMP	HOT	1				0.948	0.976	0.969	0.840
	HCD	0.959	0.039	24.337	***	0.901			
	HEM	0.896	0.044	20.589	***	0.824			
	HFR	1.086	0.041	26.319	***	0.949			
	HIS	0.999	0.039	25.608	***	0.932			
	HRE	0.974	0.038	25.96	***	0.939			
OL	OL5	1				0.862	0.942	0.944	0.772
	OL4	1.030	0.037	27.791	***	0.870			
	OL3	1.013	0.034	29.796	***	0.901			
	OL2	1.010	0.035	28.976	***	0.888			
	OL1	0.973	0.038	25.526	***	0.873			
DL	DL6	1				0.838	0.947	0.946	0.746
	DL5	1.084	0.038	28.430	***	0.851			
	DL4	1.033	0.037	27.591	***	0.894			
	DL3	1.045	0.039	27.105	***	0.885			
	DL2	1.042	0.039	26.426	***	0.873			
	DL1	1.014	0.041	24.755	***	0.840			
DC	DC5	1				0.927	0.973	0.972	0.873
	DC4	1.050	0.023	46.244	***	0.924			
	DC3	0.994	0.023	43.639	***	0.950			
	DC2	0.967	0.023	41.556	***	0.938			
	DC1	0.936	0.023	40.597	***	0.932			
EDC	EDC6	1				0.899	0.969	0.968	0.834
	EDC5	1.075	0.031	35.123	***	0.916			
	EDC4	1.094	0.029	37.592	***	0.939			
	EDC3	1.046	0.030	34.837	***	0.914			
	EDC2	1.050	0.029	36.422	***	0.929			
	EDC1	0.990	0.031	31.641	***	0.881			
EDP	EDP1	1				0.857	0.956	0.957	0.786
	EDP2	1.052	0.037	28.108	***	0.877			

Table 5.5 : Continued

	EDP3	1.039	0.035	29.496	***	0.898			
	EDP4	1.049	0.035	29.565	***	0.899			
	EDP5	1.044	0.036	29.194	***	0.894			
	EDP6	1.018	0.035	29.126	***	0.893			
CC	CC4	1				0.825	0.892	0.902	0.699
	CC3	0.805	0.039	20.419	***	0.770			
	CC2	1.023	0.04	25.654	***	0.882			
	CC1	1.057	0.044	24.252	***	0.862			

5.6 Measurement Model

5.6.1 Total Model Fit

Model fit is the degree of agreement between the theoretical and observed models. Fit indices were used to evaluate the measurement model in this investigation. Generally, results above 0.9 are desirable, while 0.8–0.9 are satisfactory. These indices include GFI, AGFI, CFI, TLI, and NFI. RMSEA and SRMR are also acceptable if discrepancy indices are below 0.8 and 0.05 (Iacobucci, 2010). The choice of these fit indicators in this study is grounded on their excellent performance in simulated studies (Hu & Bentler, 1999). As shown in Table 4, the study utilised the maximum likelihood estimation method in AMOS 26.0 software, conducting a test using structural equation modelling. The fit indices for the data and model are as follows: $\chi 2$=3044.353, $\chi 2$/DF=2.673, RMSEA=0.055, CFI=0.947, IFI=0.947, TLI=0.943, GFI=0.822. All major fit indices are greater than or close to 0.9, demonstrating a good level of fit. The overall model fit is satisfactory.

Table 5.6 : The Goodness of Fit Indices of the Overall Measurement

Fit indicates	χ^2/df	RMSEA	GFI	IFI	CFI	TLI
Reference	<3	<0.080	>0.800	>0.800	>0.800	>0.800
Test	2.673	0.055	0.831	0.947	0.947	0.943

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5.6.2 Discriminatory Validity

Fornell and Larcker (1981) introduced the term "discriminant validity" (DV) in the context of the evaluation of SEM involving latent variables and measurement error. DV is concerned with the extent to which a given construct differs significantly from others in the specified structure (Hair Jr et al., 2014). In other words, latent constructs should explain more variance in the measurement items they share with one construct than with another. DV is the low correlation or significant difference between latent variables and other latent variables. When each latent variable's square root of the AVE exceeds its inter-variable correlation, discriminant validity is robust (Fornell & Larcker, 1981). This shows that indicator variables represent distinct underlying traits. Table 5.7 indicates that the square root of the AVE for each latent variable is always higher than its association with other latent variables. Thus, the measurement model distinguishes constructions well.

Table 5.7 : Discriminatory Validity

Dimensions	CC	HIHRMP	EDP	EDC	DC	DL	OL
CC	**0.836**						
HIHRMP	0.785	**0.917**					
EDP	0.761	0.776	**0.886**				
EDC	0.815	0.827	0.824	**0.913**			
DC	0.724	0.873	0.747	0.821	**0.934**		
DL	0.716	0.903	0.723	0.779	0.866	**0.864**	
OL	0.766	0.904	0.795	0.821	0.830	0.852	**0.879**

Note: The diagonal values in bold represent the square root of AVE, and the lower triangle shows the Pearson correlation coefficients between different dimensions.

5.6.3 Common Method Biases

Various remedies were employed to address a common method variance. Before the questionnaires of the survey were distributed, attention was given to the wording of

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all items in the questionnaire to ensure clarity and conciseness, addressing the common method variance issue. The survey questionnaire underwent a pilot test to guarantee the clarity of the wording. Measurement items of the same construct were distributed throughout the entire questionnaire. Participants were made aware that their responses would remain undisclosed. Following data collection, an exploratory factor analysis was conducted, as recommended by Podsakoff et al. (2003), revealing that a single factor did not emerge, with the first factor not capturing the majority of the variance (below 50%).

The model incorporates a marker variable to examine partial correlation procedures, and the results indicate that the relationship and significance of the correlations did not change. The unmeasured latent method factor technique was employed to investigate the significance of constructs with method factors and structural indicators with method factors. The results reveal that the measurement model has some insignificant adjustments. Variance inflation factors were used to diagnose multicollinearity, with none exceeding 5.0 (Hair Jr et al., 2014). Therefore, no signs of common method variance were found in this study. Single-factor confirmatory factor analysis was performed on all hypothesis testing scale items. To indicate there is no major common method bias, fit indices must be much worse than the original model. A common method bias test was conducted for all self-report items, showing a poor model fit: $\chi 2/df = 7.95$, CFI = 0.795, GFI = 0.517, AGFI = 0.469, NFI = 0.770, RMSEA = 0.108. Therefore, there is no evidence of significant common method bias issues (Appendix A).

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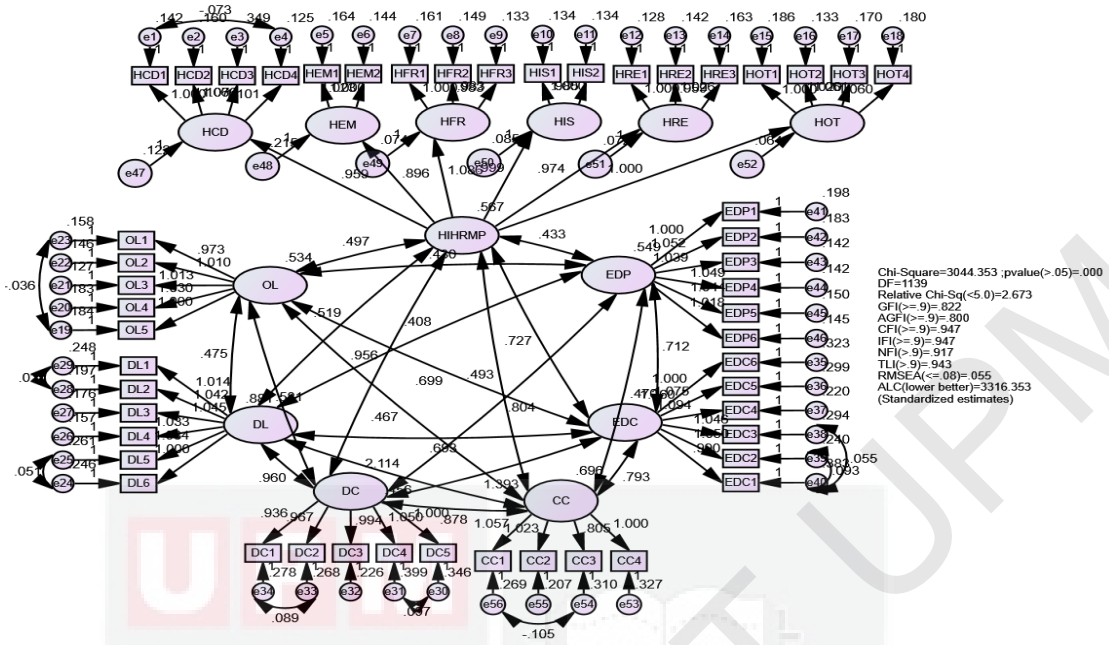

Figure 5.9 : Total Fit Measurement Model

5.7 Structural Equation Modelling (SEM)

5.7.1 Structural Researchers Can Formally Test Measurement Hypotheses and Adjust Them to Better Align with the Actual Response Structure of the Scale Participants

The following diagram shows the structural relationship fit for the 46-item structural model. The SEM analysis employed a maximum likelihood estimation, and the data and model fit indices are: $\chi 2(599) = 2537.827$, CMIN/DF = 2.644, CFI = 0.957, AGFI = 0.826, IFI = 0.957, RMSEA = 0.052, TLI = 0.954. Major fit indices are near 0.9 or above. These findings suggest the attitude-behaviour association paradigm is conceptually and empirically sound. All key fit indices are near or above 0.9, indicating a good fit. The model fit is good.

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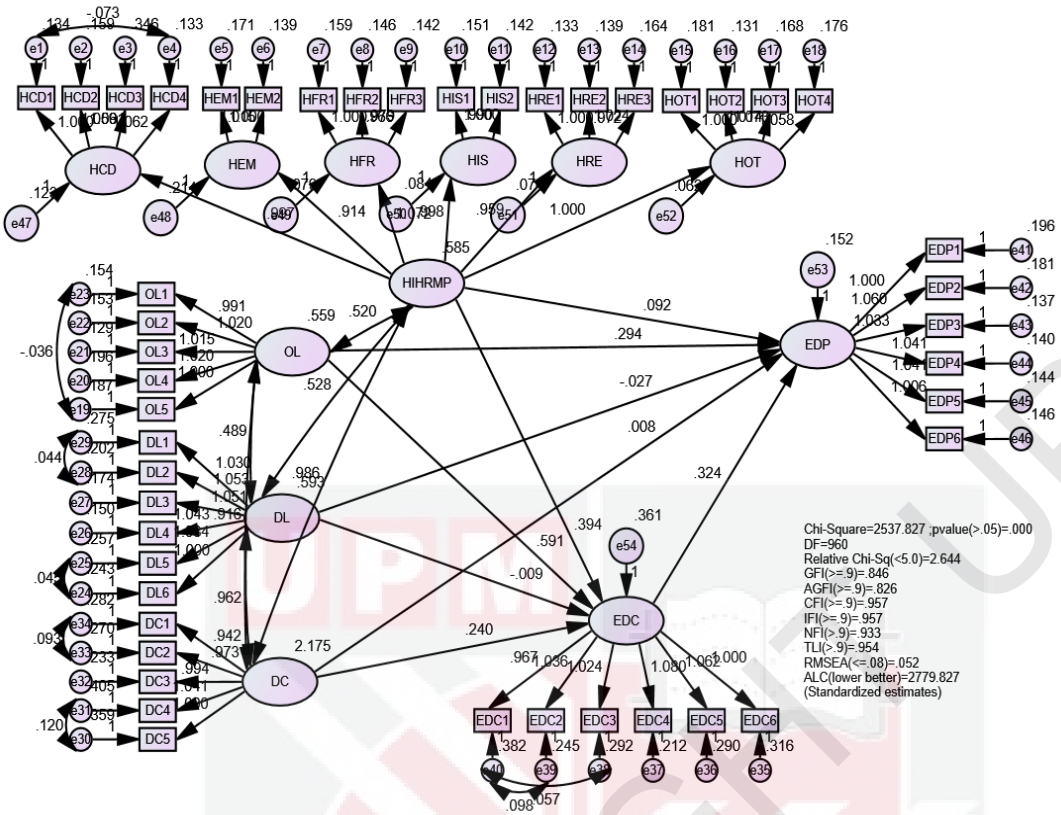

Figure 5.10 : Structural Model Fit

5.7.2 Path Relation Test

This study confirmed the theoretical hypotheses with SEM. SEM controls measurement errors in model estimation and tests mediation effects by comparing alternative models to the assumed model's goodness of fit. Regression analysis was used to analyse DL, DC, HI-HRMP, OL, and EDP connections. SEM route analysis and hypothesis testing followed.

The standardised route coefficients in Table 5.8 show no statistically significant relationship between DL and EDP ($\beta1 = -0.027$, $p > 0.05$), indicating that Hypothesis H1a is not supported. Similarly, there is no significant relationship between DC and EDP ($\beta2 = 0.008$, $p > 0.05$), leading to the rejection of Hypothesis H1b. The

relationship between HI-HRMP and EDP is not significant (β3 = 0.092, p > 0.05), implying that Hypothesis H1c is not supported. However, there is a significant relationship between OL and EDP (β4 = 0.294, p =*** < 0.01), supporting Hypothesis H1d. The relationship between DL and EDC is not significant (β5 = -0.009, p > 0.05), leading to the rejection of Hypothesis H2a. There is a significant direct impact of DC on EDC (β6 = 0.240, p =*** < 0.01), supporting Hypothesis H2b. Similarly, HI-HRMP has a significant direct impact on EDC (β7 = 0.394, p=*** <0.01), supporting Hypothesis H2c. OL also has a significant relationship with EDC (β8 = 0.591, p < 0.05), supporting Hypothesis H2d. EDC has a significant relationship with EDP (β9 = 0.324, p =*** < 0.01), supporting Hypothesis H4. A p-value less than 0.05 indicates a 95% confidence that the results are not due to random error, but rather they reflect a real effect. This is typically considered statistically significant, implying that the null hypothesis can be rejected. A p-value less than 0.01 suggests that in the context of hypothesis testing, if the null hypothesis were true, the probability of observing the results, or more extreme outcomes, is less than 1%. This is generally viewed as a stronger statistical significance, providing further justification for rejecting the null hypothesis (Kennedy-Shaffer, 2019).

Table 5.8 : Path Relationships

Path Relationship	Unstd	S.E.	Z	P	Std	Hypnosis
HIHRMP →EDC	0.394	0.136	2.907	0.004	0.251	supported
OL→EDC	0.591	0.108	5.491	***	0.367	supported
DL→EDC	-0.009	0.099	-0.091	0.927	-0.006	unsupported
DC→EDC	0.240	0.044	5.434	***	0.294	supported
OL→EDP	0.294	0.073	3.997	***	0.292	supported
DL→EDP	-0.027	0.065	-0.422	0.673	-0.028	unsupported
DC→EDP	0.008	0.030	0.285	0.775	0.017	unsupported
EDC→EDP	0.324	0.033	9.785	***	0.519	supported
HIHRMP→EDP	0.092	0.090	1.030	0.303	0.094	unsupported

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5.7.3 Mediation Model Test

To analyse the mediating effects, Hayes (2009) proposes that the Bootstrap method is the most reliable and resilient approach. The integration of AMOS enables seamless incorporation of any desired number of random samples and the establishment of suitable confidence intervals (Hayes, 2009). The fundamental idea behind this approach is that there is a mediating impact if the confidence interval does not include zero, and a mediating effect if the confidence interval does include zero (Hayes & Rockwood, 2017).

To investigate the mediating effects of direct and indirect components, this study used 1,000 iterations of bias-corrected percentile Bootstrap resampling in the structural equation model. The results are shown in Table 5.9. Because zero occurs outside of their 95% confidence ranges, the indirect effects of "HI-HRMP-EDC-EDP," "OL-EDC-EDP," and "DC-EDC-EDP" are all statistically significant. However, the mediation pathway "DL-EDC-EDP" includes 0 within the 95% confidence interval, indicating that this mediation pathway is not supported. Therefore, the mediating effect for hypotheses H3b, H3c, and H3d are supported， and H3a is unsupported. Furthermore, it can be observed that "IE1/TIE" is 16.8%, indicating that the HI-HRMP-EDC-EDP mediation path accounts for 16.8% of the effect. "IE2/TIE" explains 25.2%, suggesting that the OL-EDC-EDP path accounts for 25.2%. DE2/TE explains 26.0 %, indicating that the direct effect of OL→EDP explains 26%. Table 5.9 presents the results of the analysis. Therefore, from the bootstrap mediation model analysis, it is evident that OL is most beneficial for enhancing EDP (with direct effects explaining 26% and indirect effects explaining 19.2%).

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Table 5.9 : Bootstrap Mediated Effects Test

Path relationships		Point estimate	Product of coefficient		Bootstrapping Bias-corrected 95%CI		Percentile 95%CI	
			SE	Z	Lower	Upper	Lower	Upper
Intermediation, direct, total effects test								
EIIE1	HIHRMP→EDC→EDP	0.128	0.071	1.803	0.014	0.283	0.018	0.301
EIIE2	OL→EDC→EDP	0.192	0.050	3.840	0.109	0.312	0.092	0.290
EIIE3	DL→EDC→EDP	-0.003	0.047	-0.064	-0.097	0.082	-0.100	0.080
EIIE4	DC→EDC→EDP	0.078	0.022	3.545	0.041	0.131	0.038	0.126
DE1	HIHRMP→EDP	0.092	0.125	0.736	-0.134	0.397	-0.135	0.388
DE2	OL→EDP	0.294	0.103	2.854	0.096	0.511	0.079	0.496
DE3	DL→EDP	-0.027	0.073	-0.370	-0.162	0.121	-0.162	0.121
DE4	DC→EDP	0.008	0.044	0.182	-0.080	0.093	-0.082	0.091
TIE	TIE	0.762	0.043	17.721	0.678	0.842	0.680	0.844
DE	DE	0.367	0.072	5.097	0.224	0.507	0.231	0.511
TE	TIE+DE	1.129	0.104	10.856	0.920	1.322	0.937	1.341
Comparison of mediation effects								
EIIEDiff1	EIIE1 VS. EIIE2	-0.064	0.102	-0.627	-0.242	0.142	-0.233	0.166
EIIEDiff2	EIIE1VS.EIIE3	0.131	0.106	1.236	-0.032	0.369	-0.031	0.372
EIIEDiff3	EIIE2 VS. EIIE3	0.195	0.069	2.826	0.080	0.355	0.064	0.336
Percentage of mediated and direct effects								
P1	EIIE1/TIE	0.168	0.092	1.826	0.020	0.377	0.022	0.387
P2	EIIE2/TIE	0.252	0.068	3.706	0.139	0.410	0.115	0.385
P3	EIIE3/TIE	-0.004	0.061	-0.066	-0.127	0.111	-0.131	0.108
P4	EIIE4/TIE	0.102	0.031	3.290	0.052	0.174	0.049	0.171
P5	DE1/TE	0.082	0.108	0.759	-0.117	0.327	-0.124	0.320
P6	DE2/TE	0.260	0.087	2.989	0.079	0.434	0.070	0.427
P7	DE3/TE	-0.024	0.064	-0.375	-0.152	0.105	-0.152	0.108
P8	DE4/TE	0.008	0.039	0.205	-0.069	0.086	-0.071	0.085

5.7.4 Moderate Model Analysis

Figure 5.11 analyses the overall structural relationships and the fitting effects. The EDP consists of 16 questionnaire items. The structural equation model analysis utilised maximum likelihood estimation. The fit indices for the data and the model are as follows: $\chi 2(599) = 396.543$, CMIN/DF = 3.572, GFI=0.921, CFI = 0.977, AGFI = 0.891, IFI = 0.977, RMSEA = 0.068, CFI = 0.980, and TLI = 0.977. All major fit indices have values that are either more than or approximately equal to 0.9. The results demonstrate that the proposed adjustment model is strong and reliable both in terms of theory and empirical evidence. All the major fit indices have values that are greater than or very close to 0.9, indicating a high level of fit. The model's overall fit is considered satisfactory.

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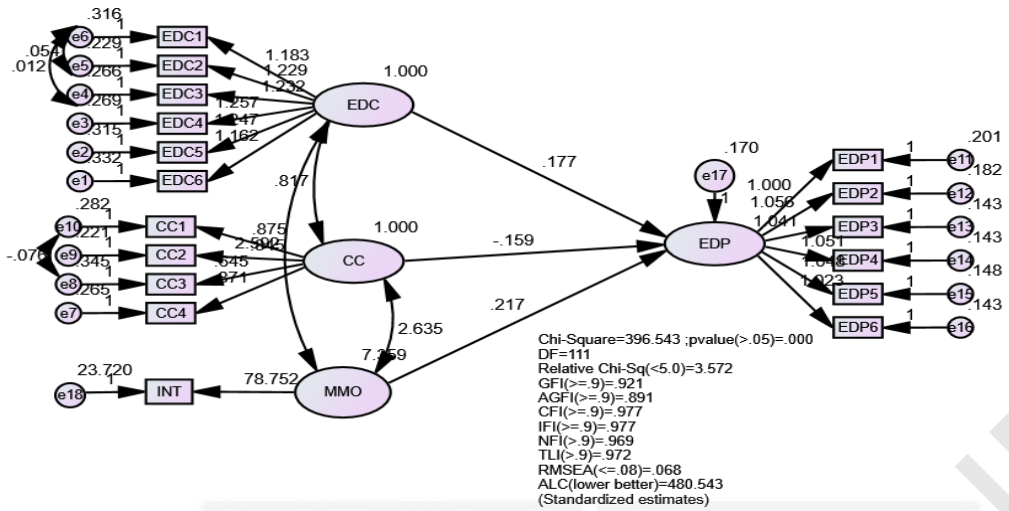

Figure 5.11 : Structural Mode for Moderating

5.7.5 Moderating Model Tests

Ping (1995) analysed moderating variables using structural equations in his paper entitled Parsimonious Estimating Technique for Interaction and Quadratic Latent Variables. Ping (1995) presented an alternative estimating technique for interaction and quadratic latent variables that avoids many obstructions. The technique involves structural equation analysis and specifies interaction or quadratic latent variables with a single indicator. In addition, there is no need to estimate the loadings and error terms of that single indicator in the structural model; it can be specified as a constant in the model. This research investigates the efficacy of the technique by recovering known coefficients, detecting known significant effects, and measuring the fit of known models to the data in synthetic datasets. This study employed AMOS for the analysis of moderating variables, grounded in the theoretical basis of the analysis model validated through multiple experiments by Ping (1995). This study employs Ping's methodology for calculating interaction terms (EDC × CC) by considering the impacts of each observed variable in the linear model. Subsequently, these interaction terms

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are incorporated into the mediation model, making explicit connections between the interaction terms and EDC.

In addition, Ping (1995) proposed the need to calculate the path coefficients of the interaction term (EDC × CC) based on the effects of various observed variables in the linear model (Cortina et al., 2001). Subsequently, the interaction term was incorporated into the mediation model, and direct relationships between the interaction term and EDP were specified. The analysis results indicate that this moderation model fits the data well. The inclusion of the interaction term has led to an improved data fit of the model. Additionally, the interaction between EDC and the competitive climate significantly and positively correlates with EDP (α=0.068, P<0.01). The analytical results validate the suitability of this moderation model for the data. Introducing the interaction terms enhances the accuracy of the data fitting. This indicates that a favourable competitive environment has a positive effect on the link between EDC and EDP, therefore confirming Hypothesis H4.

Table 5.10 : Path Relationship for Moderator

Path relationship	Unstd.	S.E.	Z	P	Hypnosis
EDC → EDP	0.177	0.075	2.361	0.018	Supported
CC→ EDP	-0.159	0.058	-2.747	0.006	Supported
MMO → EDP	0.217	0.041	5.261	***	Supported

To more clearly elucidate the moderating effect of CC the relationship between EDC and EDP, this study employed regression analysis using SPSS 26.0, specifically PROCESS v3.5 by Andrew F. Hayes (Hayes, 2009). The analysis was conducted with 1,000 bootstrap samples, a 95% confidence interval, and Johnson-Neyman output, which is applicable when the independent variable, dependent variable, and

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moderating variable are all continuous. This study utilized the Johnson-Neyman method (J-N method) for simple slope analysis (Toyama, 2024). As illustrated in Figure 5.12, when the CC score falls within the range of [1.25, 5] (β = 0.387, SE = 0.031, 95% CI = [0.325, 0.448]), EDC exhibits a significant positive impact on EDP. Furthermore, the influence of EDC on EDP strengthens as the CC intensifies.

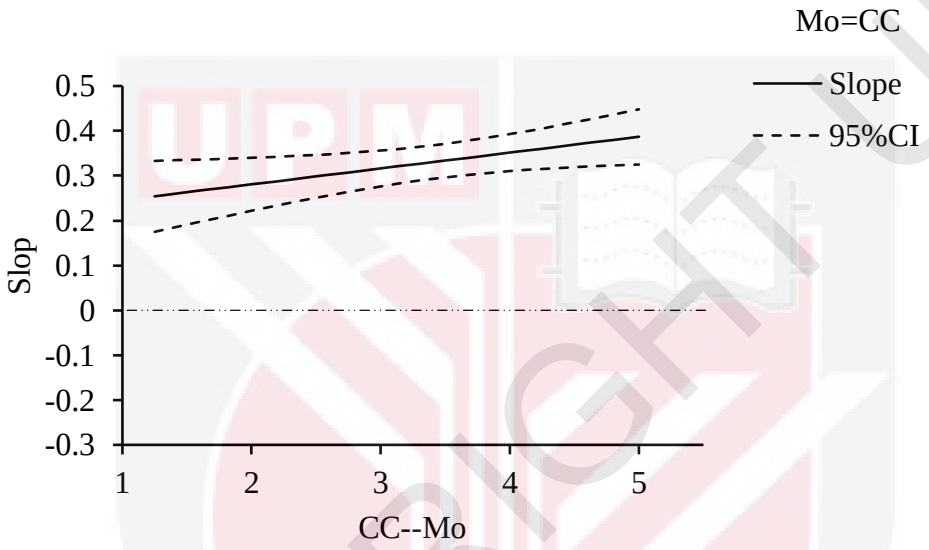

Figure 5.12 : Moderating Relationship between CC on EDC and EDP
Note: The horizontal axis represents the moderating variable (CC), while the vertical axis indicates the variation in regression coefficients (i.e., slopes) in the regression equation, where EDP serves as the dependent variable, EDC as the independent variable, and CC as the moderating variable. The upper and lower curves denote the 95% confidence interval values.

5.7.6 The Results of Moderation-Mediation Model

This study employed structural equation modelling (SEM) to fit and analyse the mediation moderation model. The following Figure 5.12 presents the overall analysis paths and results.

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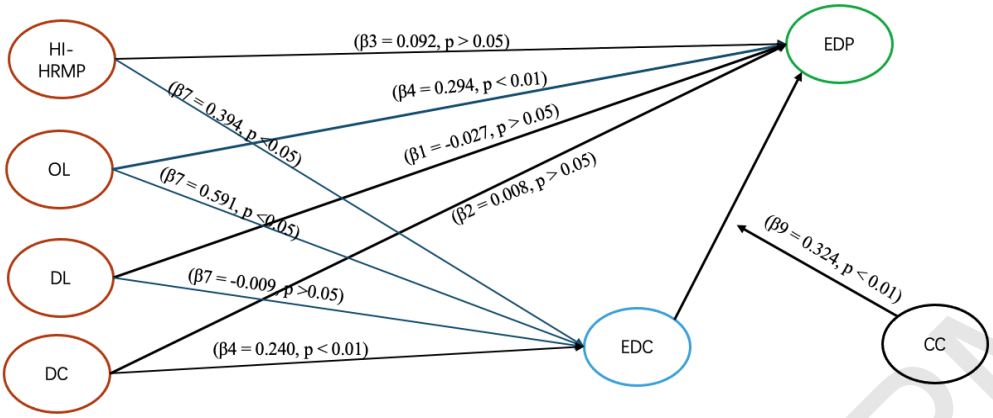

Figure 5.13 : Model Estimation for the Moderation-Mediation Model

5.7.7 Analysis of Results

Table 5.11 : Summary of Hypothesised Results

No	Hypotheses	Results
H 1a	There is a positive relationship between DL and EDP in SMEs.	Unsupported
H 1b	There is a positive relationship between DC and EDP in SMEs.	Unsupported
H 1c	There is a positive relationship between HI-HRMPs and EDP in SMEs.	Unsupported
H 1d	There is a positive relationship between OL and EDP in SMEs.	Supported
H 2a	There is a positive relationship between DL and EDC in SMEs.	Unsupported
H2b	There is a positive relationship between DC and EDC in SMEs.	Supported
H2c	There is a positive relationship between HI-HRMP and EDC in SMEs.	Supported
H2d	There is a positive relationship between OL and EDC in SMEs.	Supported
H3a	EDC as a mediating variable positively affects the relationship between DL and EDP in SMEs.	Unsupported
H3b	EDC as a mediating variable positively affects the relationship between DC and EDP in SMEs.	Supported
H3c	EDC as a mediating variable positively affects the relationship between HI-HRMP and EDP in SMEs.	Supported
H3d	EDC as a mediating variable positively affects the relationship between OL and EDP in SMEs.	Supported
H4	There is a positive relationship between EDC and EDP in Chinese SMEs.	Supported
H5	CC has a positive moderation effect between EDC and EDP in Chinese SMEs.	Supported

Firstly, the findings reveal that merely having strong DL does not directly or indirectly result in better EDP in digital tasks among employees. Instead, other contributing factors, such as robust OL, effective HI-HRMP, and strengthening the DC of SMEs, can improve EDP.

Secondly, the results look at the Non-Direct Impact of HI-HRMP and DC on EDP. Relying solely on these practices does not directly enhance EDP. This may be because in a rapidly changing digital market, other factors, such as employees' ability to adapt to and learn new technologies (EDC), are more critical in influencing EDP. Moreover, these rejected hypotheses, to some extent, support the study's broader argument. As repeatedly emphasised in this research, in a dynamic digital market, EDC is crucial. Therefore, only by fully mobilising EDC can digital performance goals be thoroughly enhanced. This, in turn, reinforces the argument that EDC plays a key mediating role (Bieńkowska et al., 2021b; Bieńkowska & Tworek, 2020, 2024). The study results indicate that while DC and HI-HRMP are important, their impact on EDP is more likely indirect, achieved through the enhancement of EDC—their ability to adapt to, learn, and apply new digital skills. This aligns with the primary argument of this study, i.e., focusing on cultivating EDC is key to improving EDP, rather than relying solely on DL, HRMPs, DC, or OL in the digital market.

Finally, the findings of this study indicate that within an optimal competitive range, an intensified CC in SMEs positively moderates the impact of EDCs on their digital performance. Therefore, in China, where a competitive culture prevails, fostering a positive competitive environment within organizations will be highly beneficial for the digital development of SMEs.

5.8 Chapter Summary

This chapter first provides an overview of the data analysis methods and results employed in data collection. Initially, normality tests, outlier analysis, collinearity diagnostics, and model fit tests were conducted, with the results indicating compliance

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with normal distribution and fit standards suitable for social science research. Next, descriptive statistical analysis, confirmatory factor analysis, and common variance analysis were performed. Finally, results were derived through the Structural Equation Modelling (SEM). The chapter concludes with a summary of the hypotheses. The next chapter will provide a comprehensive overview and discussion based on the conclusions of this analysis.

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CHAPTER 6

DISCUSSION AND CONCLUSION

6.1 Introduction

This section begins by summarising the conclusions drawn from the study, followed by a discussion of the research findings. Subsequently, it elaborates on the theoretical and practical implications, concluding with prospects for future research.

6.2 Summary of the Study

This research aims to investigate the impact of OSV and EDC on EDP in Chinese SMEs in dynamic digital market. Specifically, this study considers OSV as independent variables (DL, DC, HI-HRMPs, and OL). EDC is a mediating variable, and CC is a moderating variable between EDC and EDP. The findings indicate that in the context of Chinese SMEs, DL, HI-HRMP and DC do not have a direct impact on EDP. However, OL emerges as a direct or indirect influencing factor on EDP. Interestingly, the study reveals that EDC plays a crucial mediating role between OL, DC and HI-HRMP and EDP. This indicates that EDC plays a pivotal role in translating organisational efforts into improvements in EDP in dynamic digital era. Moreover, the research underscores the moderating role of the CC in the relationship between EDC and EDP. That is, when the CC of SMEs falls within a certain range, the impact of EDCs on their digital performance increases as the CC intensifies. This result highlights the significance of aligning internal practices with CC, emphasising the need for context-aware approaches in enhancing EDP in Chinese SMEs. Surprisingly, the results of this study indicate that DL neither directly influences EDP nor impacts it indirectly through the mediation of EDC. The possible reason is that SMEs operating

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in a digital environment are consistently faced with VUCA characteristics (Troise et al., 2022). This compels digital leaders of SMEs to continually adjust their development strategies and business models (Cousins, 2018). Compared to large enterprises, SMEs' strategic adjustments are characterised by shorter timeframes, relatively lower costs, and greater flexibility (Xi et al., 2017). Under such market conditions, SMEs often need to make frequent changes, which can impact employee motivation. Moreover, if employees are unclear about the directives from their leaders, it may weaken their work motivation, thereby diminishing the impact on performance (Lubis et al., 2020; Troise et al., 2022).

6.3 Discussion of Research Findings

6.3.1 Objective 1: Relationship between OSV and EDP

Hypothesis H1a proposed that there is significant relationship between DL and EDP. However, the results of this study indicate that DL does not directly impact EDP, which is consistent with previous predictions (Muniroh et al., 2022). Firstly, the scarcity of organisational and cognitive resources imposes constraints on the realisation of DL. Moreover, complex management and high costs pose particular challenges for SMEs (Da Silva et al., 2023). Several factors might contribute to this outcome:

1) In Chinese SMEs, the traditional management culture emphasises centralised decision-making, which may diminish the impact of DL. Employees are more accustomed to traditional leadership styles and have not yet adapted to new digital leaders' approaches, making it challenging to enhance EDP effectively (Wang et al., 2022).

2) SMEs often face constraints in tangible resources, which could also impede the implementation and effectiveness of DL. Even if leaders have a vision for

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digitalisation, the lack of necessary support resources may prevent the effective execution of these strategies, thereby affecting the realisation of EDP (Wang et al., 2024). Therefore, the results of this study indicate that digital leaders in Chinese SMEs may still exhibit shortcomings in areas such as innovative thinking, employee motivation, and communication which could hinder the achievement of EDP (Borah et al., 2022).

Hypothesis H1b proposed that there is significant relationship between DC and EDP. However, the results of this study indicate that DC does not directly impact EDP, which is consistent with the conclusions of earlier researchers (Adnan et al., 2022; Fu et al., 2023a; Heredia et al., 2022; Kin & Ho, 2023). DC cannot directly influence EDP in SMEs. Instead, it can only have a positive impact on organisational performance through technological skills and employee motivation. In other words, the development of DC is crucial for mediating effects that lead to improved performance by fostering innovation and leveraging technological skills. This is particularly significant in the economies of developing countries as the implementation of digital platforms is disruptive (Heredia et al., 2022; Fu et al., 2023). Furthermore, DC significantly influences digital innovation capabilities, indicating that the higher the organisation's DC, the stronger is its innovation capabilities in the digital realm (Adnan et al., 2022). The result of H1b indicates that DC, mediated by factors such as digital-related personnel skills, motivation, digital skills, and innovation capabilities, contributes to enhancing EDP. This suggests that achieving higher EDP requires employees to possess digital skills, initiative, and digital expertise.

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Thus, it is evident that employees' utilisation of digital-related resources and capabilities themselves is a crucial factor in achieving EDP. This indicates humans' ability to adapt behaviours and learning according to changes in the work environment, as well as their understanding of the causal relationship between performance (Nasiri et al., 2020). DC is also a crucial prerequisite for the sustained competitive advantage of businesses (Leão & Da Silva, 2021). In other words, a comprehensive DC constitute a prerequisite for sustainable management, serving as the foundation for employees to enhance creativity and initiative through the utilisation of digital infrastructure (Mollah et al., 2023). Moreover, the fundamental growth of any company's productivity and performance hinges on the characteristics of its human capital (Ramadani et al., 2017). The EDP of organisations does not originate solely from DC but rather from the creativity of its employees and ongoing research and development activities by using digital resources. Therefore, it can be inferred that DC alone is insufficient for achieving success in innovation performance standards. DC not only assist businesses in adapting to dynamic and complex changes in both internal and external environments but also expands the depth and breadth of value creation within the enterprise (Usai et al., 2021).

Hypothesis H1c suggests that HI-HRMP does not have a direct impact on EDP in SMEs. No evidence was found to support Hypothesis H1c. The findings of this study indicate that HI-HRMP is likely to impact EDP through a mediating mechanism (Cahyadi et al., 2022). This finding aligns with the outcomes of prior research conducted in the digital age (Cahyadi et al., 2022; Renkema et al., 2021a). Indications point to the fact that HI-HRMPs may need a considerable amount of time to exert a substantial influence on EDP. The adaptation and response of employee behaviours

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and attitudes to new practices may require a certain amount of time, just as the measurement of changes in digital performance typically requires time (Cahyadi et al., 2022; Rubel et al., 2020, 2023a). This is mostly because employees may have varied reactions to HI-HRMPs, which can be ascribed to their distinct attributes, previous experiences, motivations, and other parameters that exert influence. Therefore, it is essential for enterprises to fully understand the distinct differences among employees to tailor and maximise HRMPs, thereby enhancing EDP more effectively.

Hypothesis H1d proposed that there is significant relationship between OL and EDP in SMEs. This aligns consistently with past research conducted in various industries (Meher & Mishra, 2022; Mollah et al., 2023; Putra & Ruslan, 2021). OL serves as the wellspring of competitive advantage and is a critical element for the future success of businesses (Baker et al., 2022). Moreover, OL facilitates the creation, acquisition, dissemination, and integration of internal knowledge within an organisation (Ferreira et al., 2021b). OL enhances employees' skills and innovation capabilities, consequently fostering the improvement of EDP. The analysis of the direct impact of OL on EDP in SMEs reveals a positive influence. This suggests that the higher the level of OL application is, the higher is the EDP in SMEs. This finding is consistent with the conclusions of (Meher & Mishra, 2022) who found that OL significantly enhances performance by encouraging individuals or employees to dedicate themselves to achieving company goals, sharing information, learning, developing skills, and acquiring new knowledge, thereby promoting performance improvement.

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6.3.2 Objective 2: Relationship between OSV and EDC

Hypothesis H2a proposed that there is a positive relationship between DL and EDC in SMEs.However, extensive empirical research in various industries in the past has demonstrated the direct and indirect significant impacts between DL and dynamic capability (Mihardjo & Rukmana, 2019, 2019; Mihardjo, Sasmoko, Alamsyah, et al., 2019; Mihardjo, Sasmoko, Alamsjah, et al., 2019; Sasmoko et al., 2019; Schwarzmüller et al., 2018; Shin et al., 2023). Market-oriented and collaboration-oriented digital leadership-driven innovation capability development also plays a crucial role in fostering dynamic capability (Mihardjo, Sasmoko, Alamsjah, et al., 2019; Mihardjo, Sasmoko, Alamsyah, et al., 2019; Sasmoko et al., 2019). Surprisingly, this study found that DL does not directly influence EDC. This can be explained from the following perspectives:

1) Although DL aims to motivate employees, the lack of specific strategies or resources during implementation results in the inability to effectively support the development of EDC, thus failing to achieve the desired motivational outcomes (Erhan et al., 2022).

2) While digital leader's strategies are perceived within the organisation, there may be a gap between employees' perceptions and their actual actions. In other words, even though digital leaders are supportive of their employees, the latter may not fully comprehend or embrace these motivational initiatives, leading to an inability to stimulate their dynamic capabilities (Gao & Gao, 2024).

3) Previous studies have shown that DL can enhance employee motivation (Mohamed, 2022) and foster innovative behaviour (Muniroh et al., 2022b). However, the development of DL typically requires more complex investments and ongoing support (Junaid et al., 2023). This may explain why the impact on EDC is not always evident. Moreover, the effectiveness of DL is highly dependent on employees' receptiveness and engagement. If

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employees have low acceptance of digital transformation or insufficient understanding and recognition of new technologies and leadership styles, even active promotion of digital transformation by leadership may not significantly enhance their dynamic capabilities (Porfírio et al., 2021).

Hypothesis H2b proposed that there is a positive relationship between DC and EDC in SMEs, confirming that DC plays a crucial role in driving EDC. To begin with, the substantial positive impact of DC on EDC is consistent with the results of previous studies (Blanka et al., 2022; Farzaneh et al., 2021; Khin & Ho, 2019). This discovery implies that DC often encompasses the acquisition and application of digital expertise and knowledge. This type of knowledge transfer equips individuals with the ability to comprehend and effectively utilise digital tools, technology, and data(Blanka et al., 2022). Consequently, this empowers individuals to effectively navigate evolving circumstances and acquire the skills necessary to creatively utilise digital resources to resolve problems (Blanka et al., 2022). It is more likely that employees will innovate, adapt, and optimise time, data, and information if they have access to digital resources. Effective resource management is a critical component in enabling EDC. Additionally, SMEs that possess robust dynamic capabilities may gain a competitive advantage and dynamic capabilities that help people work efficiently and effectively, thereby improving company performance. This competitive advantage is the result of dynamic capabilities and the foundation of SMEs' success in dynamic business environments (Hernández-Linares et al., 2021).

Furthermore, **Hypothesis H2d** proposed that there is a positive relationship between OL and EDC in SMEs ,the significant positive impact of OL on EDC aligns with similar consistency found in studies such as Farzaneh et al. (2021), Garmaki et al.

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(2023), Hung et al. (2010), and Pollok et al. (2019). These studies show that OL and EDC efficiently bridge the crucial role of stakeholders in digital development within dynamic capabilities. This means OL entails acquiring, sharing, and distributing internal knowledge within a business that actively supports learning and gives its staff the latest industry insights, best practices, and new trends (Garmaki et al., 2023). Moreover, employee training and skill development, including digital skills, are also part of internal learning. Skill development helps staff adapt to new technology and digital tools; thus, improving EDC (Zahoor et al., 2022).

Ultimately, OL facilitates the sharing of knowledge and encourages collaboration among employees. By exchanging thoughts, collaborating on projects, and learning from each other, the aggregate knowledge and competency awareness of individuals increase; hence, enhancing the enterprise's development capabilities. OL helps organisations optimise data, information, and technology. Dynamic capabilities allow SMEs to adapt to change and capture opportunities by efficiently using these resources (Kordab et al., 2020; Mollah et al., 2023). Consequently, OL has a positive impact on EDC. To enhance EDC and effectively respond to the rapidly evolving digital environment, firms must cultivate a culture that prioritises learning and perpetual development.

Hypothesis H2c proposed that there is significant relationship between HI-HRMP and EDC, which is consistent with previous predictions (Bieńkowska et al., 2021; Bieńkowska & Tworek, 2020; Tworek et al., 2023). In their research, it is repeatedly emphasised that if an organisation implements effective HRMPs, it will significantly enhance EDC. This study substantiates this critical conclusion. The results indicate

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that if an organisation provides formal training and capacity-building activities, grants employees a certain degree of autonomy in their work arrangements, provides fair internal reward and compensation systems, regularly informs employees of the latest developments within the organisation and their own performance, and both leaders and colleagues recognise employees' contributions to the organisation, it will foster trust and ensure equitable treatment. Such practices will indeed contribute to the improvement of EDC (Rubel et al., 2017). Thus, if SMEs can effectively implement HI-HRMP, they will be able to positively influence the development of EDC.

6.3.3 Objective 3: Mediating Effect of EDC in the Relationship between OSV and EDP

Hypothesis H3a: EDC as a mediating variable positively affects the relationship between DL and EDP in SMEs. However, this research result indicates that EDC does not mediate the relationship between DL and EDP in Chinese SMEs. Although previous studies indicate that DL impacts dynamic capability either directly or indirectly (Collins, 2021; Lopez-Cabrales et al., 2017; Al-kharabsheh et al., 2022), there is a clear distinction between dynamic capability and EDC (Bieńkowska & Tworek, 2020). Conceptually, dynamic capability is defined as an organisation's ability to acquire, integrate, and utilise resources in dynamic environments to secure a sustained competitive advantage. Conversely, EDC relates to the capacity of employees to contribute effectively to dynamic markets (Bieńkowska & Tworek, 2020; Tworek et al., 2023). Thus, the primary difference between these concepts' rests on the agents responsible for achieving organisational performance goals—the organisation itself versus its employees. The results of this study indicate that DL has

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minimal impact on the development of EDC and EDP in SMEs. This can be explained from several perspectives:

1) For DL to influence employees through their dynamic capabilities, these capabilities must be sufficiently developed. However, in many SMEs, employees may lack development opportunities, which means that their dynamic capabilities—such as the ability to quickly adapt to environmental changes, perceive external risks, and seize opportunities—are not fully nurtured. As a result, even if leaders promote digital transformation, the insufficient development of EDC makes it difficult for this leadership to translate it into actual performance improvements (Quansah et al., 2022).

2) DL in SMEs may focus more on promoting the use of technological tools while neglecting the comprehensive development of employees' capabilities. Leaders might view digitalisation primarily as a technological issue rather than a matter of employee capability and organisational change. This technology-driven approach to DL may fail to effectively stimulate and develop EDC, thereby limiting the impact of these capabilities on EDP as a mediating variable (Peter et al., 2020). Moreover, SMEs often face resource constraints, making it difficult for digital leaders to invest in long-term employee capability development. Additionally, these enterprises may prioritise short-term goals over long-term capability building, which further explains why DL fails to influence performance through the long-term development of employee capabilities. Thus, the limitations of resources and the short-sightedness of strategies restrict the ability of DL to enhance EDC (Li et al., 2018).

Hypotheses H3b indicate that EDC as a mediating variable positively affects the relationship between DC and EDP in SMEs, which is consistent with previous predictions(Cannas, 2023; De Mori et al., 2016; Warner, 2019; Yeow et al., 2018). Prior studies have demonstrated that DC refers to an organisation's capacity to proficiently employ digital technology, tools, and procedures to accomplish strategic

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goals (De Mori et al., 2016). Dynamic capability, in the context of SMEs, pertains to the efficient utilisation of DC by individuals to enhance job performance (Cannas, 2023). The adaptive nature of dynamic capability allows individuals to efficiently react and adjust to digital alterations, difficulties, and possibilities. Having a strong DC is essential for having the appropriate technology infrastructure. Highly adaptable employees are more likely to adopt and effectively use DC, which in turn improves their work performance (Yeow et al., 2018). DC is the fundamental basis for innovation since it encompasses the provision of digital tools, platforms, and data. Furthermore, it is the ability to adapt and respond to change that propels the creation and execution of cutting-edge digital solutions (Heredia et al., 2022). Dynamic capability empowers individuals to proficiently analyse and resolve intricate digital obstacles, whereas DC supplies the necessary tools to discover and tackle digital issues (Warner, 2019). Additionally, organisations need to adjust dynamic capability based on DC, integrate innovative performance through dynamic capability, and consider the impact on existing asset knowledge (Su et al., 2023).

However, past research has not differentiated between dynamic capability and EDC. This study highlights the significant role of employees in utilising internal digital resources for EDP. It clarifies the crucial role of employees within organisations in the digital age. This means that DC entail learning and improving digital skills and knowledge. These abilities boost EDC and promote EDP when employees master them. DC also helps employees share digital information. They disseminate this knowledge inside the firm, fostering a learning culture and digital expertise. The corporate data centre relies on knowledge sharing to adapt and learn. Thus, cultivating

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employee digital capacities directly affects EDP and strengthens their dynamic capabilities, allowing them to succeed in the ever-changing digital landscape.

Hypotheses H3d indicate that EDC as a mediating variable positively affects the relationship between OL and EDP in SMEs. Therefore, this confirms that EDC transforms OL into improved EDP. The mediating impact, as measured by EII1/EE2, explains 10.8% of the variance. This implies that the influence of OL in both EDC and EDP surpasses that of DC, providing additional support to the findings of Guo et al. (2021). DCs have the ability to streamline the learning process for businesses and enable efficient and innovative business models (Guo et al., 2021). Organisations may enhance the accuracy and speed of information acquisition, sharing, and utilisation by promoting employee learning and leveraging DCs, hence improving learning and performance efficiency (Bui & Le, 2023). Moreover, EDC serves as a mediator between OL and EDP, providing support and aligning with research findings (Gunawan et al., 2022; Li & Wang, 2022; Meher & Mishra, 2022). This discovery suggests that OL improves the process of gaining and disseminating knowledge inside the organisation. In addition, OL promotes the involvement of employees in activities that require analytical thinking, finding solutions to problems, and generating new ideas. When employees participate in learning activities, they are exposed to novel materials, enabling them to not only acquire this knowledge but also successfully utilise it in the digital setting, hence enhancing EDP (Shao et al., 2022; Zhang et al., 2024). However, past research has mainly focused on the direct or indirect effects of OL on organisational performance through dynamic capability. Previous research has also investigated the influence of EDC on job performance (Bieńkowska & Tworek, 2020, 2024; Tworek et al., 2023). EDC facilitates this connection by utilising the

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creative thinking and analytical skills developed via OL to address digital obstacles. EDC enables employees to tackle digital challenges effectively and innovatively, ultimately improving EDP. Most literature has demonstrated the significant role of dynamic capability in job performance (Ferreira et al., 2023; Ghasemzadeh et al., 2022; Hernández-Linares et al., 2021); nevertheless, a detailed exploration of the differentiation between EDC and dynamic capacity is lacking.

Hypothesis H3c: EDC plays a mediating role in the connection between HI-HRMP and EDP in SMEs in Chinese SMEs. H3c reveals that HI-HRMP is employed to identify the roots of EDC, aiming to enhance EDP. Our findings indicate that promoting EDP is facilitated through the mediation of EDC. This study extends existing research on the relationship between HI-HRMP and EDP. Past research has consistently demonstrated that HI-HRMP fosters an environment conducive to the development of dynamic capabilities by empowering employees, enabling them, implementing fair rewards, and promoting information sharing and recognition (Rubel et al., 2017, 2018, 2020). Moreover, HI-HRMP has been found to enhance performance outcomes by cultivating dynamic capabilities (Li & Wang, 2022). Additionally, HI-HRMP plays a crucial role in nurturing employees' ability to adopt or adapt to workplace changes, thereby enhancing employee performance and gaining a competitive advantage. The findings of this study align with previous research (Delery & Roumpi, 2017b; Gu et al., 2023; Rubel et al., 2018). The results here demonstrate that HI-HRMP influences EDP through EDC. This finding is intriguing as it aids in linking employee-engagement-oriented HRMP with employee effectiveness through the mediation of EDC. From the research outcomes, it can be inferred that operating the HI-HRM system and encouraging employee adaptation to

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technology could potentially turn human resources and HRMPs into sources of technological innovation (Rubel et al., 2023).

Furthermore, prior studies have highlighted the significant contribution of HI-HRMP to organisational performance (Rubel et al., 2023; Wood & Ogbonnaya, 2018). While there is empirical evidence on the impact of HI-HRMP on employee performance (Cahyadi et al., 2022; Rubel et al., 2023), its effectiveness in the context of dynamically changing digital markets has not been adequately demonstrated. Moreover, there remains considerable ambiguity regarding how to achieve EDP. This study not only underscores the pivotal role of employees in the digital era but also validates that organisational support (DC, HI-HRMP, and OL) enhances EDC, leading to improved EDP (Shao et al., 2022; Zhang et al., 2022).

Moreover, empirical research outcome indicates that HI-HRMP typically emphasises employee development and involvement in decision-making processes (Rubel et al., 2017). If these practices are specifically designed to enhance employees' digital skills, adaptability, and ability to embrace technological changes, the development of EDC is necessary and improving that EDP would logically follow. HI-HRMP may be more closely aligned with specific digital capabilities required for effective performance within the organisation (Rubel et al., 2023). If HI-HRMP aligns with the organisation's digital goals and technological requirements, it is more likely to foster the development of EDC associated with EDP. Lastly, HI-HRMP typically enhances employee engagement and commitment.

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Engaged employees are more likely to proactively learn new skills and adapt to technological changes. The commitment fostered by HI-HRMP may translate into a greater willingness to invest time and effort in developing dynamic capabilities, ultimately improving EDP. Previous studies have observed that in dynamic marketplaces, EDC is more effective as a mediating factor compared to employee attitudes and behavioural characteristics (Bieńkowska & Tworek, 2020; Phan et al., 2022; Tworek et al., 2023). However, this assertion has not been empirically validated. Considering that this study examines Chinese SMEs in a particular area of China, a significant amount of research on the influence of Confucian culture in China has shown that competitive attitudes and behaviours positively affect workplace performance (Baumann & Winzar, 2017; Chen & Lin, 2020; Viengkham et al., 2018).

6.3.4 Objective 4: The Moderating Effect of Competitive Climate between EDC and EDP

Hypothesis H5 addresses research question 5, and the findings indicate that CC influences the relationship between EDC and EDP. Therefore, the presence of H5 indicates that a competitive cultural environment has a significant influence on the development and performance of organisations in specific regions of China. The presence of CC has a moderating effect on both EDC and EDP. This finding is supported by previous studies (Chen & Zheng, 2022; Farzaneh et al., 2021;Wang et al., 2018). Previous research has also shown that CC moderates the relationship between dynamic capabilities and performance (Nedzinskas et al., 2013; Wilden & Gudergan, 2015),as well as the relationship between job crafting and job performance (Wang et al., 2018).

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Essentially, the competitive environment of SMEs in China has a significant impact on the relationship between EDC and EDP. It serves as a source of motivation for employees to pursue excellence, promotes ongoing learning, nurtures innovation, and improves flexibility. These criteria are essential elements of EDC, which plays a crucial role in influencing EDP in a competitive setting. This finding suggests that within an optimal competitive setting, employees are strongly inclined to outperform their colleagues, hence motivating them to excel in digital assignments. The goal to achieve a competitive advantage drives individuals to actively improve their skills and capacities, which in turn leads to enhancements in the corporate data centre. Competitive scenario ignites invention and fosters creativity. This research promotes and supports employees in suggesting inventive solutions to digital obstacles, outperforming their colleagues. This drive significantly improves EDC (Entrepreneurial, Design, and Creative) by incorporating adaptability and creative problem-solving, which are essential elements of dynamic skills (Yang, 2020). Ultimately, the intense CC of Chinese SMEs significantly influences the connection between EDC and EDP. It serves as a source of motivation for employees to work towards achieving high standards, promotes ongoing education, nurtures the development of new ideas, and improves the ability to adjust to new circumstances.

6.4 Implications of the Study

6.4.1 Theoretical Implications

First, organisational support resources (DC, OL, and HI-HRMP) can be effectively utilised to enhance EDC, thereby improving EDP and supporting the RBT. DL, HI-HRMP, DC, and OL have been repeatedly demonstrated as being VRIN resources

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with sustainable competitive advantage. According to the RBT, if the internal resources of an organisation meet the criteria defined by the RBT (VRIN resources) (Barney, 2001; Seddon, 2014), sustainable competitive advantage can be generated. Consequently, this study posits that within SMEs, the strategic utilisation of resources possessing VRIN attributes facilitates the attainment of a sustainable competitive advantage (Seddon, 2014; Lin & Wu, 2014). This perspective extends the application of the RBT within the realm of digital development. The study underscores that given the inherent resource constraints of SMEs, prioritising the deployment of digital and human resources is instrumental in fostering the sustainable development of the organisation (Seddon, 2014; Rubel et al., 2023).

Second, while DCT has been extensively studied in the past, the academic community has not yet made a clear distinction between dynamic capabilities and EDC(Bieńkowska & Tworek, 2020, 2024; Tworek et al., 2023). The concept of EDC was first proposed in 2022, marking it as a novel concept in academic research (Bieńkowska & Tworek, 2020). This study fully acknowledges the crucial role of EDC in the digital market. The uniqueness of this study lies in its differentiation between dynamic capabilities and EDC, expanding the scope of dynamic capabilities and fully reflecting the importance of employees in the digital age (Shao et al., 2022; Zhang et al., 2022; Wang et al., 2024). Therefore, the integration of organisational support factors with EDC is a significant theoretical contribution of this study.

Third, the original model suggests that for an organisation to maintain sustained competitive advantage, they must have resources, strategy, capabilities, and environments that are formed as an organic system (Barney, 2001; Teece, 2018). The

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interaction of these factors with CC facilitates EDP and promotes digital transformation. This study highlights the pivotal influence of cultural and organisational climates across various regions on enterprise development. Consequently, the seamless integration of resources, dynamic capabilities, and the regional context emerges as a crucial consideration for contemporary organisational managers in the strategic implementation of HRMP (Yang, 2020; Wang et al.,2028).

Based on the RBT and DCT (Seddon, 2024; Teece, 2018), merely possessing variables with VRIN resource characteristics is insufficient to achieve sustainable competitive advantage in dynamic markets (Seddon, 2014; Yu & Liu, 2014). In other words, in dynamic markets, the RBT becomes ineffective, and dynamic capabilities are the key determinant. The findings of this study also indicate that, except for OL, DL, DC, and HI-HRMP do not directly influence EDP; rather, digital performance goals can only be achieved through EDC. Therefore, this study first validates the effectiveness of the theoretical framework. Second, it confirms the dynamic nature of digital markets, characterized by VUCA (Li & Wu, 2014; Teece ,2018; Bienkowska & Tworek, 2020). Finally, it demonstrates that EDCs exhibit the attributes of dynamic capabilities. The construction of this theoretical framework holds significant theoretical implications for SMEs undergoing digital transformation.

Specifically, the RBT and DCT suggest that resources, strategies, capabilities, and the environment form an integrated system that can help organisations maintain a sustainable competitive advantage (Bieńkowska & Tworek, 2020; Teece, 2018). However, these theories do not explicitly clarify how these elements interact with each

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other. This study establishes a clear pathway of the relationships, representing the most significant theoretical contribution of the research.

Previous research has primarily emphasized dynamic capabilities at the organizational level. In contrast, this study refines this perspective by focusing on EDC and demonstrating their mediating role in enhancing EDP (Bieńkowska & Tworek, 2020; Teece, 2018). Furthermore, this study integrates OSV—DL, HI-HRMP, DC, and OL—into the framework of EDP, contributing to a human resource-based perspective on digital transformation (Zhang & Chen, 2024; Shao et al., 2022). Notably, this study incorporates a contextual factor, the CC, and empirically demonstrates its moderating effect on the relationship between EDC and EDP. This finding provides theoretical guidance for future research on cultural environments and regional variations (Wang et al., 2024). Additionally, this study not only offers practical insights for SME managers but also advances theoretical discussions on digital transformation, employee competencies, and organizational strategy (Teng et al., 2022; Liu, 2025). By integrating regional differences and competitive dynamics, the research findings present a comprehensive framework for understanding and enhancing EDP.

6.4.2 Practical Implication

This study has several implications. Firstly, past studies indicate that the returns for innovators of business models are four times higher than those for innovators of products and services (Bashir & Verma, 2017). The findings of this study suggest that by continuously adjusting leadership strategies, modifying various HRMPs, updating internal organisational resources, and establishing ongoing training programmes,

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firms can maximise employee-based resources to achieve sustained competitive advantage.

Secondly, this study integrates the concepts of organisational support resources (DL, HI-HRMP, OL, and DC) and EDC into a comprehensive framework. It provides a nuanced understanding of how these organisational factors interact to influence EDP. Research indicates that OL and EDC are crucial for enhancing EDP, suggesting that policymakers could drive digital transformation by supporting corporate training programmes. This implies that managers should actively develop DC and establish a well-structured training system to boost the EDP of SMEs. Moreover, the study shows that DC and HI-HRMP do not directly improve EDP; hence, it is important to remind managers to focus on developing EDC (such as perception, seizing, and transforming), which are essential for achieving EDP in dynamic digital market.

Thirdly, the novel contribution of this study is the demonstration of how CC moderates the relationship between EDC and EDP. This is based on the unique cultural environment of China, emphasising competitive context as a catalyst for EDP internally (Teece, 2018). Therefore, in the process of implementing HRMP, SMEs actively foster an effective CC, such as holding sales competitions and establishing effective promotion systems. These measures can stimulate employees' competitive awareness, thereby positively impacting EDP within the organisation. Therefore, this study introduces a new perspective on how environmental factors influence the effectiveness of organisational practices. It deepens the existing knowledge of performance models, indicating that the impact of organisational support may vary depending on the competitive environment (Yang, 2020; Wang et al., 2024). Moreover,

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the findings of this study not only confirm the crucial role of employees in the digital transformation process but also demonstrate that EDCs are a prerequisite for translating OSV into EDP. In other words, in a rapidly evolving digital market, effectively enhancing EDCs is essential to motivating them to leverage digital technologies to achieve performance goals.

Furthermore, this study examines the impact of digital transformation on SMEs across different regions from an industry perspective. SMEs in Shanghai and Guangdong are primarily concentrated in high-tech industries, trade, and manufacturing, with a well-established foundation for digital transformation. Benefiting from a robust industrial infrastructure and government-driven technological incentives, these SMEs have greater access to digital infrastructure and skilled talent (Teng et al., 2022; Liu, 2025). Consequently, employees exhibit a higher baseline level of DCs, amplifying the effect of OSV on EDP. In contrast, Guizhou's relatively low level of industrialization, weak infrastructure, and limited presence of high-tech enterprises pose significant challenges to digital transformation. Meanwhile, Anhui's high-tech manufacturing sector is expanding, with digital transformation progressing at an accelerated pace (Luo & Zhou, 2022; Wang et al., 2022). Compared to coastal regions, SMEs in Guizhou and Anhui rely more heavily on organizational support, such as adopting DL and HI-HRMPs, to enhance EDP.

Analysis of the Effectiveness of Digital Transformation in SMEs from a Regional Policy Perspective： Shanghai and Guangdong: Benefiting from national pilot projects, SMEs in these regions have rapidly developed in DL and DCs. However, the study finds that DL does not directly impact EDP. This is primarily because these

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enterprises have already established mature digital management systems, where EDP is largely driven by OL and optimized HRMP (SME Information Network, 2024; Wang et al., 2024). Anhui: With policies focusing on intelligent manufacturing and digital technology applications, this study suggests that promoting OL among SMEs will significantly EDP (Liu, 2024). Guizhou: Government investments have primarily been directed toward infrastructure development (Luo & Zhou, 2022; Wang et al., 2022). However, SMEs in this region lag in DCs and HI-HRMPs, limiting EDC. Overcoming these barriers is a crucial challenge for enterprises in less developed digital economies. Furthermore, CC moderates the relationship between OSV and EDP. In highly competitive, technology-driven regions such as Shanghai and Guangdong, employees must rapidly enhance their digital skills to maintain competitiveness. In contrast, in less competitive regions such as Guizhou and Anhui, the pace of digital adoption is slower. Consequently, stronger incentive mechanisms are required to accelerate digital transformation.

Managerial Implications for the Digital Transformation of Chinese SMEs：

Enhancing OL Mechanisms: OL has both direct and indirect effects on EDP. SMEs should establish digital training platforms and foster cross-departmental knowledge sharing to enhance EDC (Sun & Jung, 2024). Optimizing HI-HRMP: SMEs should tailor management approaches based on regional differences. For example, talent retention should be prioritized in Shanghai and Guangdong, while digital skills training and infrastructure investment should be strengthened in Guizhou and Anhui (Zhang & Chen, 2024). Leveraging CC for Motivation: In highly competitive regions, SMEs should utilize market pressure to drive digital transformation. In less competitive regions, governments should create a more favorable market environment

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to encourage digitalization. For instance, in technology-driven regions such as Guangdong and Shanghai, employees may need to adopt digital skills more quickly to remain competitive. Conversely, in regions with lower competitive intensity, such as Guizhou and Anhui, digital adoption may be slower. Stronger incentives and a more dynamic competitive environment should be introduced to engage employees in digital transformation and enhance EDP (Industry Observer, 2024; Teng et al., 2022). Implementing Differentiated Policies: The government should adopt adaptive policies based on regional economic development levels. Coastal regions can rely more on market-driven mechanisms (Guangdong and Shanghai), while inland areas (Guizhou and Anhui) require stronger policy support to facilitate digital transformation. Building upon existing research on SME digital transformation, this study offers distinct contributions across four key dimensions: practical implications, methodological advancements, and regional contextual analysis.

Practical Implications： Firstly, the findings provide actionable insights for managers on adjusting HR policies, leadership styles, and learning mechanisms to enhance EDP. Secondly, given regional variations in digital economic development, this study proposes locally adapted HR strategies to address differences in workforce digital skills adoption. Finally, emphasizing the direct impact of OL on EDP, this study recommends increased investment in digital skills training (Sun & Jung, 2024). Methodological Advancements： Applying SEM for Quantitative Validation: This study ensures the robustness of relationships among organizational support, EDC, and EDP (Adeoye-Olatunde & Olenik, 2021; Taherdoost, 2022). Enhancing Generalizability Through a Cross-Regional Survey: Covering four economically diverse regions—Shanghai, Guangdong, Anhui, and Guizhou—this study captures

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varied characteristics of digital transformation across different economic contexts. Regional Contextual Analysis : Unveiling Regional Disparities in Digital Transformation: This study analyzes how industry structure, policy environment, and digital maturity influence SME digitalization in different regions. The findings offer empirical support for policymakers, suggesting that coastal regions (Shanghai, Guangdong) should focus on digital innovation, while inland regions (Anhui, Guizhou) should strengthen infrastructure development and digital skills training. By integrating organizational support, EDC, and CC, this study develops a regionally contextualized framework for SME digital transformation, filling a critical research gap. Its theoretical contributions and practical implications offer valuable insights for academia, business managers, and policymakers.

6.5 Limitations and Recommendations for Future Research

Although this study has made noteworthy contributions, it is not without limitations, which suggest potential areas for further research. This study classifies EDP into two categories: task-driven performance and innovation-driven performance. The findings indicate that while the influence of OSV and EDC on EDP is evident, there is a lack of differentiation between the specific effects of DC, HI-HRMP and OL on task performance and innovative performance. Therefore, future studies should thoroughly investigate this topic. Furthermore, including EDC as a mediating variable improves our comprehension of the connections between DL, HI-HRMP, DC, OL, and EDP. Nevertheless, this study does not distinguish the various effects of EDC (such as perception, grasping, and transformation) on EDP. Hence, it is strongly suggested that future studies comprehensively explore the impact of different aspects of EDC on EDP. This thorough investigation can provide more precise and focused findings.

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This study establishes that DL, DCs, HI-HRMP, and OL have a significant impact on EDP. This implies that future research should investigate additional factors at the organisational level that influence EDP, such as perceived organisational support (POS) and organisational culture. This study relies on pre-existing literature to establish that EDC characteristics outperform employee attitude and behaviour variables. Nevertheless, this study primarily focuses on Chinese SMEs in a dynamic digital economy. Therefore, additional data and analysis are needed to confirm the applicability of these findings to various organisational contexts. This study is based on the distinct competitive cultural environment of a specific location in China and recognises the significance of considering the CC as a moderating element. It is based on a theoretical framework that is anchored in the distinctive regional competitive cultural environment in China. Therefore, it does possess specific constraints. Future studies should expand their scope beyond various countries and regions to investigate how digital transformation and CC affect EDC and EDP in diverse cultural and market settings. Since the current study primarily focuses on internal organisational support and CC, without adequately considering the impact of external factors, such as policy changes, on EDP, future research could consider introducing external environmental factors (e.g., market competition, and policy changes) as moderating variables to further explore their impact on EDP.

Although this study adopts HI-HRMP because it has been proven to help employees adapt to technology in the digital era, future research could explore additional HRMP strategies across different industries, such as in high-commitment HRMP. Additionally, beyond DC and OL, further variables such as organisational culture

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could be examined to enhance the applicability of the research model across different countries and industries.

Finally, the topics examined in this study are exclusive to certain industries within SMEs, which present certain constraints. In the future, the integration of self-reported data with objective measurements or qualitative approaches has the potential to mitigate measurement bias and yield a more holistic comprehension of the phenomenon being investigated. Additionally, this study is limited to SMEs in China, which may hinder the generalisability of the findings to other countries or large enterprises. This limitation affects the study's overall applicability. Future research should extend the study to different countries or various types of enterprises (e.g., large enterprises) to validate the generalisability and applicability of the findings.

Moreover, Cross-Sectional Design: This study employs a cross-sectional survey, capturing data at a single point in time. While this approach is effective in identifying relationships between variables, it does not allow for causal inferences or an examination of how digital transformation evolves over time (Gashaw et al., 2022). Longitudinal studies could provide deeper insights into the dynamic changes in employees' digital performance (Chirico, 2023). Self-Reported Data: The study relies on self-reported data from SME employees, which may introduce social desirability bias or subjective misinterpretation (Limon et al., 2022). Although efforts were made to mitigate these biases—such as ensuring anonymity and employing validated scales—future research could incorporate objective performance indicators or managerial evaluations to enhance data validity.

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This study reveals how organizational support influences EDP by fostering EDC under different levels of digital economic development. The findings indicate that DL, DC, and HI-HRMPs do not directly enhance EDP, suggesting that digital management relies on policies, the level of digital development, and organizational support rather than solely on leadership initiatives. Future research could further explore the long-term impact of regional economic characteristics on firms' digital transformation to provide more precise policy and managerial guidance.

6.6 Conclusion

This study delves into the factors that can influence EDP in Chinese SMEs. A comprehensive investigation unveils the subtle interrelationships among independent variables such as DL, DC, OL, and HI-HRMP. The focus is particularly on examining the mediating role of EDC and the moderating impact of the CC. The primary findings of this study hold both theoretical and practical significance, making a substantial contribution to the existing literature on EDP in SMEs.

The research reveals that DC does not directly impact EDP. EDC refers to the ability of employees to adapt, integrate, and reconfigure resources to respond to rapidly changing environments (Bieńkowska & Tworek, 2020). This capability includes learning new skills, innovative thinking, and flexibility in dealing with uncertainty (Phan et al., 2022). In a digital transformation environment, employees need to possess dynamic capabilities to effectively utilise new digital technologies; otherwise, the potential of these technologies may not be fully realised. These characteristics of EDC suggest that if employees can effectively perceive changes in the digital market, they can better prepare in advance, seize opportunities, or mitigate risks (Bieńkowska et al.,

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2021; Phan et al., 2022). Furthermore, after identifying opportunities or threats, employees must be able to quickly take action by effectively allocating and utilising digital resources to address these threats (Rodrigues et al., 2021), Additionally, after taking action, employees should continuously adjust and reconfigure organisational support resources to adapt to external environmental changes (Canhoto et al., 2021), which will enhance EDP.

The research reveals that HI-HRMP does not directly impact EDP and HI-HRMPs. Providing resources and support such as capability development, empowerment, rewards, fairness, and information sharing, can indeed enhance employees' confidence and engagement (Rubel et al., 2017, 2023). However, these practices primarily offer an environment and opportunities for employee development, boosting their potential capabilities, but do not directly translate into specific performance outcomes. Performance improvement requires employees to flexibly apply these capabilities, which necessitates the exercise of dynamic capabilities (Yeow et al., 2018).HI-HRMP functions more as a support system, providing resources and conditions, whereas dynamic capabilities are the key factors that convert these resources into actual performance. Therefore, the exercise of dynamic capabilities enables employees to effectively address the challenges of digital transformation, thereby enhancing EDP.

OL exhibits indirect and direct impacts on EDP, underscoring the crucial significance of this internal OL. This suggests that organisations enhance overall knowledge levels and capabilities through systematic learning mechanisms (Yu & Liu, 2022). This process directly impacts EDP. Furthermore, OL is regarded as a critical resource, and

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the resources provided by the organisation need to be effectively utilised through EDC (Priyono & Hidayat, 2024).OL, enhanced by EDC, enables them to better adapt to and utilise digital technologies, thereby indirectly improving EDP.

The recognition of CC as a moderating variable emphasises the importance of aligning internal practices with the external context. Organisations must adjust their strategies based on the specific challenges and opportunities posed by CC, underscoring the need for dynamic, context-aware approaches to enhance EDP. This suggests that in a competitive environment, employees often feel competitive pressure, which enhances their work initiative. This pressure can motivate them to utilise and develop dynamic capabilities more actively to respond to competitors, thereby improving their digital performance (Garcia et al., 2020). In a highly competitive environment, employees are more inclined to optimise the use of existing resources and technologies to maintain or enhance their competitive advantage. Dynamic capabilities are fully stimulated and utilised in such situations, leading to higher digital performance.

Additionally, the findings of this study also indicate that DL does not enhance EDCs, thereby affecting EDP. Several factors may contribute to this outcome. First, in Chinese SMEs, the traditional management culture emphasises centralised decision-making, which may weaken the influence of DL, as employees rely more on traditional leadership styles and have not yet adapted to new DL approaches. This lack of adaptation to new DL may hinder the effective improvement of EDP (Wang et al., 2022).Second, SMEs often face tangible resource constraints, which may also obstruct the implementation and effectiveness of DL. Even if leaders have a digital vision, the lack of necessary support resources may prevent these strategies from being

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effectively executed, thereby limiting the realisation of EDP (Wang et al., 2024b). Moreover, although the organisation perceives the strategy of digital leaders, there may be a gap between employees' perceptions and their actual actions. In other words, despite digital leaders' support for employees, they may not fully understand or embrace these incentives, leading to an inability to stimulate EDC (Gao & Gao, 2024).Therefore, the findings of this study remind digital leaders in SMEs to ensure that digital strategies and employee incentives are effectively implemented, adopting practical and feasible incentive methods that align with employees' actual needs. Only by employing management practices and effective incentives that are consistent with employees' needs, can employee motivation be stimulated thus, facilitating digital transformation. Fundamentally, this thesis paves the way for further research and provides a foundation upon which businesses can tailor strategies to optimise EDP. In doing so, it contributes to the overarching goal of advancing digital excellence in Chinese SMEs. Moreover, this study contributes to the global conversation on SME digitalization and HRMP, offering insights for policymakers, business leaders, and researchers worldwide. The findings provide a benchmark for countries at different stages of digital transformation, helping shape future global digital economy strategies.

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REFERENCES

Abbas, J., Raza, S., Nurunnabi, M., Minai, M. S., & Bano, S. (2019a). The Impact of Entrepreneurial Business Networks on Firms' Performance Through a Mediating Role of Dynamic Capabilities. Sustainability, 11(11), 3006. https://doi.org/10.3390/su11113006

Abbas, J. (2024). Does the nexus of corporate social responsibility and green dynamic capabilities drive firms toward green technological innovation? The moderating role of green transformational leadership. *Technological Forecasting and Social Change*, *208*, 123698. https://doi.org/10.1057/s41599-024-02910-z

Abbu, H., Mugge, P., & Gudergan, G. (2022). Successful Digital Leadership Requires Building Trust. Research-Technology Management, 65(5), 29–33. https://doi.org/10.1080/08956308.2022.2095168

Abdullah, Muniroh, M., Hamidah, H., & Hamidah, T. (2021, June). Indicator analysis of employee performance based on the effect of digital leadership, digital culture, organisational learning, and innovation (case study of PT. Telkom Digital and Next Business Department). In sttal postgraduate-international conference (Vol. 5, No. 1, pp. 324-334).

Abdurrahman, A., Gustomo, A., & Prasetio, E. A. (2024). Impact of dynamic capabilities on digital transformation and innovation to improve banking performance: A TOE framework study. *Journal of Open Innovation: Technology, Market, and Complexity*, *10*(1), 100215. https://doi.org/10.1016/j.joitmc.2024.100215

Abourokbah, S. H., Mashat, R. M., & Salam, M. A. (2023). Role of Absorptive Capacity, Digital Capability, Agility, and Resilience in Supply Chain Innovation Performance. Sustainability, 15(4), 3636. https://doi.org/10.3390/su15043636

Acosta-Prado, J. C., & Tafur-Mendoza, A. A. (2024). Examining the mediating role of dynamic capabilities in the relationship between information and communication technologies and sustainable performance. VINE Journal of Information and Knowledge Management Systems, 54(3), 561-577. https://doi.org/10.1108/VJIKMS-10-2021-0257

Adnan, A. Z., Ahman, E., Disman, D., Yuniarsih, T., & Yusuf, R. (2022). The Effect of Talent Management and Innovation Digital Capability on Employee Performance. Budapest International Research and Critics Institute-Journal (BIRCI-Journal), 5(2), 8890-8899. https://doi.org/10.59889/ijembis.v3is.161

Adomako, S., Amankwah-Amoah, J., & Frimpong, K. (2022). Human capital, reverse engineering and new venture growth: The moderating role of competitive strategy. Technovation, 114, 102520. https://doi.org/10.1016/j.technovation.2022.102520

© COPYRIGHT UPM

Adeoye-Olatunde, O. A., & Olenik, N. L. (2021). Research and scholarly methods: Semi-structured interviews. Journal of the american college of clinical pharmacy, 4(10), 1358-1367. https://doi.org/10.1002/jac5.1441

Agus Triansyah, F., Hejin, W., & Stefania, S. (2023). Factors Affecting Employee Performance: A Systematic Review. Journal Markcount Finance, 1(2), 118–127. https://doi.org/10.55849/jmf.v1i2.102

Akcam, B. K., Guney, S., & Cresswell, A. M. (2019). Research Design and Major Issues in Developing Dynamic Theories by Secondary Analysis of Qualitative Data. Systems, 7(3), 40. https://doi.org/10.3390/systems7030040

Akenroye, T. O., Owens, J. D., Elbaz, J., & Durowoju, O. A. (2020). Dynamic capabilities for SME participation in public procurement. Business Process Management Journal, 26(4), 857–888. https://doi.org/10.1108/BPMJ-10-2019-0447

Ajayi, F. A., & Udeh, C. A. (2024). Agile work cultures in IT: A Conceptual analysis of hr's role in fostering innovation supply chain. International Journal of Management & Entrepreneurship Research, 6(4), 1138-1156. https://doi.org/10.51594/ijmer.v6i4.1004

Akter, S., Wamba, S. F., Gunasekaran, A., Dubey, R., & Childe, S. J. (2016). How to improve firm performance using big data analytics capability and business strategy alignment? International Journal of Production Economics, 182, 113–131. https://doi.org/10.1016/j.ijpe.2016.08.018

Al Wali, J., Muthuveloo, R., Teoh, A. P., & Al Wali, W. (2023). Disentangling the relationship between employees' dynamic capabilities, innovative work behaviour and job performance in public hospitals. International Journal of Innovation Science, 15(2), 368–384. https://doi.org/10.1108/IJIS-01-2022-0012

Al-Edenat, M. (2023). Organizational competencies toward digital transformation at the events of disruptive changes: an operational process innovation perspective. Competitiveness Review: An International Business Journal, 33(4), 690-710. https://doi.org/10.1108/CR-05-2021-0081

Alegre, J., & Chiva, R. (2008). Assessing the impact of organisational learning capability on product innovation performance: An empirical test. Technovation, 28(6), 315–326. https://doi.org/10.1016/j.technovation.2007.09.003

Ali-Hassan, H., Nevo, D., & Wade, M. (2015). Linking dimensions of social media use to job performance: The role of social capital. The Journal of Strategic Information Systems, 24(2), 65–89. https://doi.org/10.1016/j.jsis.2015.03.001

Alikaj, A., Ning, W., & Wu, B. (2021). Proactive Personality and Creative Behaviour: Examining the Role of Thriving at Work and High-Involvement HR Practices. Journal of Business and Psychology, 36(5), 857–869. https://doi.org/10.1007/s10869-020-09704-5

© COPYRIGHT UPM

Al-kharabsheh, S. A., Attiany, M. S., Alshawabkeh, R. O. K., Hamadneh, S., & Alshurideh, M. T. (2023a). The impact of digital HRM on employee performance through employee motivation. International Journal of Data and Network Science, 7(1), 275–282. https://doi.org/10.5267/j.ijdns.2022.10.006

Al-kharabsheh, S. A., Attiany, M. S., Alshawabkeh, R. O. K., Hamadneh, S., & Alshurideh, M. T. (2023b). The impact of digital HRM on employee performance through employee motivation. International Journal of Data and Network Science, 7(1), 275–282. https://doi.org/10.5267/j.ijdns.2022.10.006

Allwood, C. M. (2012). The distinction between qualitative and quantitative research methods is problematic. Quality & Quantity, 46(5), 1417–1429. https://doi.org/10.1007/s11135-011-9455-8

Alromaihi, M. A., Alshomaly, Z. A., & George, S. (2017). Job satisfaction and employee performance: A theoretical review of the relationship between the two variables. International Journal of Advanced Research in Management and Social Sciences, 6(1), 1-20.

ALSAFADI, Y., & ALTAHAT, S. (2021). Human Resource Management Practices and Employee Performance: The Role of Job Satisfaction. The Journal of Asian Finance, Economics and Business, 8(1), 519–529. https://doi.org/10.13106/JAFEB.2021.VOL8.NO1.519

Alsufyani, N., & Gill, A. Q. (2022). Digitalisation performance assessment: A systematic review. Technology in Society, 68, 101894. https://doi.org/10.1016/j.techsoc.2022.101894

Altınay Aksal, F. (2016). Are Headmasters Digital Leaders in School Culture? TED EĞİTİM VE BİLİM, 40(182). https://doi.org/10.15390/EB.2015.4534

Alwali, J. (2023). The innovative–performance connection: How dynamic capabilities empower nurses. International Journal of Innovation Science. https://doi.org/10.1108/IJIS-11-2022-0211

Anastasiu, L., Gavriş, O., & Maier, D. (2020). Is Human Capital Ready for Change? A Strategic Approach Adapting Porter's Five Forces to Human Resources. Sustainability, 12(6), 2300. https://doi.org/10.3390/su12062300

Andersén, J. (2021). Resource orchestration of firm-specific human capital and firm performance—The role of collaborative human resource management and entrepreneurial orientation. The International Journal of Human Resource Management, 32(10), 2091–2123. https://doi.org/10.1080/09585192.2019.1579250

Annarelli, A., Battistella, C., Nonino, F., Parida, V., & Pessot, E. (2021). Literature review on digitalisation capabilities: Co-citation analysis of antecedents, conceptualization and consequences. Technological Forecasting and Social Change, 166, 120635. https://doi.org/10.1016/j.techfore.2021.120635

© COPYRIGHT UPM

Anwar, S., & Saraih, U. N. (2024). Digital leadership in the digital era of education: enhancing knowledge sharing and emotional intelligence. International Journal of Educational Management, 38(6), 1581-1611. https://doi.org/10.1108/IJEM-11-2023-0540

Apascaritei, P., & Elvira, M. M. (2022). Dynamizing human resources: An integrative review of SHRM and dynamic capabilities research. Human Resource Management Review, 32(4), 100878. https://doi.org/10.1016/j.hrmr.2021.100878

Aramburu, N., North, K., Zubillaga, A., & Salmador, M. P. (2021a). A Digital Capabilities Dataset From Small- and Medium-Sized Enterprises in the Basque Country (Spain). Frontiers in Psychology, 11, 587949. https://doi.org/10.3389/fpsyg.2020.587949

Arashpour, M., Golafshani, E. M., Parthiban, R., Lamborn, J., Kashani, A., Li, H., & Farzanehfar, P. (2023). Predicting individual learning performance using machine-learning hybridized with the teaching-learning-based optimization. Computer Applications in Engineering Education, 31(1), 83–99. https://doi.org/10.1002/cae.22572

Ardito, L., Raby, S., Albino, V., & Bertoldi, B. (2021). The duality of digital and environmental orientations in the context of SMEs: Implications for innovation performance. Journal of Business Research, 123, 44–56. https://doi.org/10.1016/j.jbusres.2020.09.022

Arias-Pérez, J., & Vélez-Jaramillo, J. (2022). Ignoring the three-way interaction of digital orientation, Not-invented-here syndrome and employee's artificial intelligence awareness in digital innovation performance: A recipe for failure. Technological Forecasting and Social Change, 174, 121305. https://doi.org/10.1016/j.techfore.2021.121305

Arndt, F., & Pierce, L. (2018). The behavioural and evolutionary roots of dynamic capabilities. Industrial and Corporate Change, 27(2), 413–424. https://doi.org/10.1093/icc/dtx042

Asemokha, A., Musona, J., Torkkeli, L., & Saarenketo, S. (2019). Business model innovation and entrepreneurial orientation relationships in SMEs: Implications for international performance. Journal of International Entrepreneurship, 17(3), 425–453. https://doi.org/10.1007/s10843-019-00254-3

Ashrafi, R., & Mueller, J. (2015). Delineating IT Resources and Capabilities to Obtain Competitive Advantage and Improve Firm Performance. Information Systems Management, 32(1), 15–38. https://doi.org/10.1080/10580530.2015.983016

Asija, A., & Ringov, D. (2021). Dynamic capabilities: The role of board monitoring and managerial incentives. BRQ Business Research Quarterly, 24(4), 268–280. https://doi.org/10.1177/2340944420916309

© COPYRIGHT UPM

Atatsi, E. A., Stoffers, J., & Kil, A. (2019). Factors affecting employee performance: A systematic literature review. Journal of Advances in Management Research, 16(3), 329–351. https://doi.org/10.1108/JAMR-06-2018-0052

Azungah, T. (2018a). Qualitative research: Deductive and inductive approaches to data analysis. Qualitative Research Journal, 18(4), 383–400. https://doi.org/10.1108/QRJ-D-18-00035

Baccarella, C. V., Maier, L., Meinel, M., Wagner, T. F., & Voigt, K.-I. (2022). The effect of organisational support for creativity on innovation and market performance: The moderating role of market dynamism. Journal of Manufacturing Technology Management, 33(4), 827–849. https://doi.org/10.1108/JMTM-10-2020-0423

Badawi, A., Utami, W., Marsoem, B., & Kurniasih, A. (2024). The Mediating Role of Sustainable Value Creation in the Relationship Between Information Technology and Competitive Advantage. Australasian Accounting, Business and Finance Journal, 18(2). https://doi.org/10.14453/aabfj.v18i2.06

Bag, S., Pretorius, J. H. C., Gupta, S., & Dwivedi, Y. K. (2021). Role of institutional pressures and resources in the adoption of big data analytics powered artificial intelligence, sustainable manufacturing practices and circular economy capabilities. Technological Forecasting and Social Change, 163, 120420. https://doi.org/10.1016/j.techfore.2020.120420

Bagdi, H., Bulsara, H. P., Sankar, D., & Sharma, L. (2023). The transition from traditional to digital: factors that propel Generation Z's adoption of online learning. International Journal of Educational Management, 37(3), 695-717. https://doi.org/10.1108/IJEM-01-2023-0003

Baía, E. P., & Ferreira, J. J. (2024). Dynamic capabilities and performance: how has the relationship been assessed?. Journal of Management & Organization, 30(1), 188-217. https://doi.org/10.1017/jmo.2019.88

Baker, W. E., Mukherjee, D., & Gattermann Perin, M. (2022). Learning orientation and competitive advantage: A critical synthesis and future directions. Journal of Business Research, 144, 863–873. https://doi.org/10.1016/j.jbusres.2022.02.003

Baldauf, S. A., Engqvist, L., & Weissing, F. J. (2014). Diversifying evolution of competitiveness. Nature Communications, 5(1), 5233. https://doi.org/10.1038/ncomms6233

Balta, M. E., Papadopoulos, T., & Spanaki, K. (2024). Business model pivoting and digital technologies in turbulent environments. International Journal of Entrepreneurial Behavior & Research, 30(2/3), 773-799. https://doi.org/10.1108/IJEBR-02-2023-0210

Bamhdi, A. M. (2024). Analysis of intangible assets reporting standards and automation in KSA within an Islamic context–a case study. Journal of Islamic

© COPYRIGHT UPM

Accounting and Business Research. https://doi.org/10.1108/JIABR-08-2023-0273

Bansal, A., Panchal, T., Jabeen, F., Mangla, S. K., & Singh, G. (2023). A study of human resource digital transformation (HRDT): A phenomenon of innovation capability led by digital and individual factors. Journal of Business Research, 157, 113611. https://doi.org/10.1016/j.jbusres.2022.113611

Bari, N., Chimhundu, R., & Chan, K.-C. (2022). Dynamic Capabilities to Achieve Corporate Sustainability: A Roadmap to Sustained Competitive Advantage. Sustainability, 14(3), 1531. https://doi.org/10.3390/su14031531

Barker, R. A. (2001). The Nature of Leadership. Human Relations, 54(4), 469–494. https://doi.org/10.1177/0018726701544004

Barney, J. (1991). Firm resources and sustained competitive advantage. Journal of management, 17(1), 99-120. https://doi.org/10.1177/014920639101700108

Barney, J. B. (2001). Resource-based theories of competitive advantage: A ten- year retrospective on the resource-based view. Journal of Management. https://doi.org/10.1177/014920630102700602

Barney, J. B., Foss, N. J., & Lyngsie, J. (2018). The role of senior management in opportunity formation: Direct involvement or reactive selection? Strategic Management Journal, 39(5), 1325–1349. https://doi.org/10.1002/smj.2768

Barney, J. B., Ketchen, D. J., & Wright, M. (2011). The Future of Resource-Based Theory: Revitalization or Decline? Journal of Management, 37(5), 1299–1315. https://doi.org/10.1177/0149206310391805

Barney, J., Wright, M., & Ketchen, D. J. (2001). The resource-based view of the firm: Ten years after 1991. Journal of Management, 27(6), 625–641. https://doi.org/10.1177/014920630102700601

Barney, J. B., Ketchen Jr, D. J., & Wright, M. (2021). Resource-based theory and the value creation framework. Journal of Management, 47(7), 1936-1955. https://doi.org/10.1177/01492063211021655

Baruch, Y., & Holtom, B. C. (2008). Survey response rate levels and trends in organisational research. Human Relations, 61(8), 1139–1160. https://doi.org/10.1177/0018726708094863

Balaton, K. (2023). A Behavioural Approach to Strategic Management. Theory, Methodology, Practice–Review of Business and Management, 19(02 (SI)), 37-42. https://doi.org/10.18096/TMP.2023.02.04

Bashir, M., & Verma, R. (2017). Why business model innovation is the new competitive advantage. IUP Journal of Business Strategy, 14(1), 7.

Baumann, C., Hamin, H., Tung, R. L., & Hoadley, S. (2016). Competitiveness and workforce performance: Asia vis-à-vis the “West”. International Journal of

© COPYRIGHT UPM

Contemporary Hospitality Management, 28(10), 2197–2217. https://doi.org/10.1108/IJCHM-12-2014-0617

Baumann, C., & Harvey, M. (2021). What is unique about high performing students? Exploring personality, motivation and competitiveness. Assessment & Evaluation in Higher Education, 46(8), 1314–1326. https://doi.org/10.1080/02602938.2020.1870930

Baumann, C., & Winzar, H. (2017). Confucianism and Work Ethic—Introducing the ReVaMB Model. In The Political Economy of Business Ethics in East Asia (pp. 33–60). Elsevier. https://doi.org/10.1016/B978-0-08-100690-0.00003-8

Beddow, H. (2021). Getting involved in innovation: How High-Involvement HRM practices support employee's to be innovative. Human Resource Management International Digest, 29(5), 1–4. https://doi.org/10.1108/HRMID-01-2021-0023

Benitez, J., Arenas, A., Castillo, A., & Esteves, J. (2022a). Impact of digital leadership capability on innovation performance: The role of platform digitization capability. Information & Management, 59(2), 103590. https://doi.org/10.1016/j.im.2022.103590

Bieńkowska, A., Koszela, A., & Tworek, K. (2021a). Verification of the Job Performance Model based on Employees' Dynamic Capabilities in organisations under the COVID-19 pandemic crisis. Engineering Management in Production and Services, 13(3), 66–85. https://doi.org/10.2478/emj-2021-0022

Bieńkowska, A., & Tworek, K. (2020a). Job Performance Model Based on Employees' Dynamic Capabilities (EDC). Sustainability, 12(6), 2250. https://doi.org/10.3390/su12062250

Bieńkowska, A., & Tworek, K. (2024). Employees' dynamic capabilities-based model of their perceived job security. Ekonomia, 29(2), 121–133. https://doi.org/10.19195/2658-1310.29.2.8

Bilan, Y., Mishchuk, H., Roshchyk, I., & Joshi, O. (2020). Hiring and retaining skilled employees in SMEs: problems in human resource practices and links with organisational success. Business:TheoryandPractice, 21(2),780-791 https://doi.org/10.3846/btp.2020.12750

Biloslavo, R., & Lombardi, R. (2021). Knowledge transferring and small and medium enterprise's (SME's) effectiveness: Emerging insights and future directions. Business Process Management Journal, 27(6), 1747–1774. https://doi.org/10.1108/BPMJ-10-2020-0441

Bitencourt, C. C., De Oliveira Santini, F., Ladeira, W. J., Santos, A. C., & Teixeira, E. K. (2020). The extended dynamic capabilities model: A meta-analysis. European Management Journal, 38(1), 108–120. https://doi.org/10.1016/j.emj.2019.04.007

© COPYRIGHT UPM

Bisri, A., Putri, A., & Rosmansyah, Y. (2023). A systematic literature review on digital transformation in higher education: Revealing key success factors. International Journal of Emerging Technologies in Learning (Online), 18(14), 164. https://doi.org/10.3991/ijet.v18i14.40201

Blanka, C., Krumay, B., & Rueckel, D. (2022a). The interplay of digital transformation and employee competency: A design science approach. Technological Forecasting and Social Change, 178, 121575. https://doi.org/10.1016/j.techfore.2022.121575

Boffa, E., & Maffei, A. (2024). Investigating the impact of digital transformation on manufacturers' Business model: Insights from Swedish industry. Journal of Open Innovation: Technology, Market, and Complexity, 10(2), 100312. https://doi.org/10.1016/j.joitmc.2024.100312

Bonsa, K. B., & Ivatury, V. M. K. (2022). Effect of Total Productive Maintenance Practices on Manufacturing Performance: An Empirical Analysis of Ethiopian Soft Drinks Manufacturing Company. International Journal of Mechanical Engineering. https://doi.org/10.1108/Jmtm-09-2015-0074

Boon, C., Eckardt, R., Lepak, D. P., & Boselie, P. (2018). Integrating strategic human capital and strategic human resource management. The International Journal of Human Resource Management, 29(1), 34–67. https://doi.org/10.1080/09585192.2017.1380063

Borah, P. S., Iqbal, S., & Akhtar, S. (2022a). Linking social media usage and SME's sustainable performance: The role of digital leadership and innovation capabilities. Technology in Society, 68, 101900. https://doi.org/10.1016/j.techsoc.2022.101900

Bornay-Barrachina, M., López-Cabrales, Á., & Salas-Vallina, A. (2023). Sensing, seizing, and reconfiguring dynamic capabilities in innovative firms: Why does strategic leadership make a difference? BRQ Business Research Quarterly, 23409444231185790. https://doi.org/10.1177/23409444231185790

Bos-Nehles, A., Renkema, M., & Janssen, M. (2017). HRM and innovative work behaviour: A systematic literature review. Personnel Review, 46(7), 1228–1253. https://doi.org/10.1108/PR-09-2016-0257

Bouwman, H., Nikou, S., & De Reuver, M. (2019). Digitalisation, business models, and SMEs: How do business model innovation practices improve performance of digitalizing SMEs? Telecommunications Policy, 43(9), 101828. https://doi.org/10.1016/j.telpol.2019.101828

Bratianu, C. (2018). Intellectual capital research and practice: 7 myths and one golden rule. Management & Marketing, 13(2), 859–879. https://doi.org/10.2478/mmcks-2018-0010

Brunner, T. J. J., Schuster, T., & Lehmann, C. (2023). Leadership's long arm: The positive influence of digital leadership on managing technology-driven change

© COPYRIGHT UPM

over a strengthened service innovation capacity. Frontiers in Psychology, 14, 988808. https://doi.org/10.3389/fpsyg.2023.988808

Brislin, R. W. (1986). The wording and translation of research instruments. In W. J. Lonner & J. W. Berry (Eds.), Field methods in cross-cultural research (pp. 137–164). Sage Publications, Inc. https://doi.org/10.4236/ojml.1986.82003

Bui, M.-T., & Le, H.-L. (2023a). Digital capability and creative capability to boost firm performance and formulate differentiated CSR-based strategy. Heliyon, 9(3), e14241. https://doi.org/10.1016/j.heliyon.2023.e14241

Buitrago R., R. E., Barbosa Camargo, M. I., & Cala Vitery, F. (2021). Emerging Economies' Institutional Quality and International Competitiveness: A PLS-SEM Approach. Mathematics, 9(9), 928. https://doi.org/10.3390/math9090928

Bujang, M. A., & Baharum, N. (2017). A simplified guide to determination of sample size requirements for estimating the value of intraclass correlation coefficient: a review. Archives of Orofacial Science, 12(1).

Bujang, M. A., Khee, H. Y., & Yee, L. K. (2022). A Step-By-Step Guide to Questionnaire Validation Research. Zenodo. https://doi.org/10.5281/ZENODO.6801209

Burrell, G., & Morgan, G. (2006). Sociological paradigms and organisational analysis: Elements of the sociology of corporate life. Routledge.

Cadden, T., McIvor, R., Cao, G., Treacy, R., Yang, Y., Gupta, M., & Onofrei, G. (2022). Unlocking supply chain agility and supply chain performance through the development of intangible supply chain analytical capabilities. International Journal of Operations & Production Management, 42(9), 1329–1355. https://doi.org/10.1108/IJOPM-06-2021-0383

Cahanar, P., & Hamsal, M. (2021). The Important Role of Corporate Entrepreneurship, Digital Capabilities, and Readiness to Change in Business Performance: Moderated by the Adoption of Business Model Innovations in the Newspaper Industry in Indonesia. Proceedings of the First International Conference of Economics, Business & Entrepreneurship, ICEBE 2020, 1st October 2020, Tangerang, Indonesia. Proceedings of the First International Conference of Economics, Business & Entrepreneurship, ICEBE 2020, 1st October 2020, Tangerang, Indonesia, Tangerang, Indonesia. https://doi.org/10.4108/eai.1-10-2020.2305515

Cahyadi, A., Marwa, T., Hágen, I., Siraj, M. N., Santati, P., Poór, J., & Szabó, K. (2022). Leadership Styles, High-Involvement Human Resource Management Practices, and Individual Employee Performance in Small and Medium Enterprises in the Digital Era. Economies, 10(7), 162. https://doi.org/10.3390/economies10070162

Cahyono, Y., Purwoko, D., Koho, I. R., Setiani, A., Supendi, S., Setyoko, P. I., Sosiady, M., & Wijoyo, H. (2023). The role of supply chain management practices on competitive advantage and performance of halal agroindustry

© COPYRIGHT UPM

SMEs. Uncertain Supply Chain Management, 11(1), 153–160. https://doi.org/10.5267/j.uscm.2022.10.012

Cai, L., Ji, Y., Wijekoon, C., & Yuan, Y. (2023). Decision-Making on Selection of Talent Management Methods in the Era of Digitalisation. Systems, 11(9), 450. https://doi.org/10.3390/systems11090450

Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D., & Walker, K. (2020). Purposive sampling: Complex or simple? Research case examples. Journal of Research in Nursing, 25(8), 652–661. https://doi.org/10.1177/1744987120927206

Canhoto, A. I., Quinton, S., Pera, R., Molinillo, S., & Simkin, L. (2021a). Digital strategy aligning in SMEs: A dynamic capabilities perspective. The Journal of Strategic Information Systems, 30(3), 101682. https://doi.org/10.1016/j.jsis.2021.101682

Cannas, R. (2021). Exploring digital transformation and dynamic capabilities in agrifood SMEs. Journal of Small Business Management, 1–27. https://doi.org/10.1080/00472778.2020.1844494

Cannas, R. (2023). Exploring digital transformation and dynamic capabilities in agrifood SMEs. Journal of Small Business Management, 61(4), 1611–1637. https://doi.org/10.1080/00472778.2020.1844494

Cao, T. T., Le, P. B., & Nguyen, N. T. M. (2022). Impacts of high-involvement HRM practices on organisational innovation capability: The mediating mechanism of tacit and explicit knowledge sharing. International Journal of Innovation Science, 14(5), 733–749. https://doi.org/10.1108/IJIS-05-2021-0091

Carroll, N., & Conboy, K. (2020). Normalising the "new normal": Changing tech-driven work practices under pandemic time pressure. International Journal of Information Management, 55, 102186. https://doi.org/10.1016/j.ijinfomgt.2020.102186

Carson, R. T., Flores, N. E., & Meade, N. F. (2001). Contingent valuation: controversies and evidence. Environmental and resource economics, 19, 173-210.

Casciani, D., Chkanikova, O., & Pal, R. (2022). Exploring the nature of digital transformation in the fashion industry: opportunities for supply chains, business models, and sustainability-oriented innovations. Sustainability: Science, Practice and Policy, 18(1), 773-795. https://doi.org/10.1080/15487733.2022.2125640

Cetindamar, D., Abedin, B., & Shirahada, K. (2022). The role of employees in digital transformation: a preliminary study on how employees' digital literacy impacts use of digital technologies. *IEEE Transactions on Engineering Management*. https://doi.org/10.1109/TEM.2022.3087724

© COPYRIGHT UPM

Ceipek, R., Hautz, J., Petruzzelli, A. M., De Massis, A., & Matzler, K. (2021). A motivation and ability perspective on engagement in emerging digital technologies: The case of Internet of Things solutions. Long Range Planning, 54(5), 101991. https://doi.org/10.1016/j.lrp.2020.101991

Černe, M., Čater, B., Čater, T., Koman, M., & Redek, T. (2023). Management innovation as an enabler of firm performance in the context of Industry 4.0: A longitudinal multi-source, multi-sector analysis. Innovation, 1–26. https://doi.org/10.1080/14479338.2023.2177858

Cetindamar Kozanoglu, D., & Abedin, B. (2021). Understanding the role of employees in digital transformation: Conceptualization of digital literacy of employees as a multi-dimensional organisational affordance. Journal of Enterprise Information Management, 34(6), 1649–1672. https://doi.org/10.1108/JEIM-01-2020-0010

Chan, D. W. M., Sarvari, H., Golestanizadeh, M., & Saka, A. (2023). Evaluating the impact of organisational learning on organisational performance through organisational innovation as a mediating variable: Evidence from Iranian construction companies. International Journal of Construction Management, 1–14. https://doi.org/10.1080/15623599.2023.2239486

Chatterjee, S., Chaudhuri, R., Sakka, G., Grandhi, B., Galati, A., Siachou, E., & Vrontis, D. (2021). Adoption of Social Media Marketing for Sustainable Business Growth of SMEs in Emerging Economies: The Moderating Role of Leadership Support. Sustainability, 13(21), 12134. https://doi.org/10.3390/su132112134

Chatterjee, S., Rana, N. P., Tamilmani, K., & Sharma, A. (2021). The effect of AI-based CRM on organisation performance and competitive advantage: An empirical analysis in the B2B context. Industrial Marketing Management, 97, 205–219. https://doi.org/10.1016/j.indmarman.2021.07.013

Chen, D., Esperança, J. P., & Wang, S. (2022). The Impact of Artificial Intelligence on Firm Performance: An Application of the Resource-Based View to e-Commerce Firms. Frontiers in Psychology, 13, 884830. https://doi.org/10.3389/fpsyg.2022.884830

Chen, J., Dong, H., Wang, X., Feng, F., Wang, M., & He, X. (2021). Bias and Debias in Recommender System: A Survey and Future Directions (arXiv:2010.03240). arXiv. http://arxiv.org/abs/2010.03240

Chen, Q., Zhang, W., Jin, N., Wang, X., & Dai, P. (2022). Digital Transformation Evaluation for Small- and Medium-Sized Manufacturing Enterprises Using the Fuzzy Synthetic Method DEMATEL-ANP. Sustainability, 14(20), 13038. https://doi.org/10.3390/su142013038

Chen, S., & Lin, N. (2020). Culture, productivity and competitiveness: Disentangling the concepts. Cross Cultural & Strategic Management, 28(1), 52–75. https://doi.org/10.1108/CCSM-02-2020-0030

© COPYRIGHT UPM

Chen, S., & Zheng, J. (2022a). Influence of Organisational Learning and Dynamic Capability on Organisational Performance of Human Resource Service Enterprises: Moderation Effect of Technology Environment and Market Environment. Frontiers in Psychology, 13, 889327. https://doi.org/10.3389/fpsyg.2022.889327

Chen, Y., & Lin, Z. (2021). Business Intelligence Capabilities and Firm Performance: A Study in China. International Journal of Information Management, 57, 102232. https://doi.org/10.1016/j.ijinfomgt.2020.102232

Chen, Y., Xu, S., Lyulyov, O., & Pimonenko, T. (2022). CHINA'S DIGITAL ECONOMY DEVELOPMENT: INCENTIVES AND CHALLENGES. Technological and Economic Development of Economy, 29(2), 518–538. https://doi.org/10.3846/tede.2022.18018

Chen, Y.-A., Guo, S.-L., & Huang, K.-F. (2023). Antecedents of internationalization of Taiwanese SMEs: A resource-based view. International Journal of Emerging Markets. https://doi.org/10.1108/IJOEM-05-2022-0875

Chirico, F. (2023). Cross-sectional studies in occupational health research: An overview of strengths and limitations. G Ital. Psicol. Med. Lav, 3(3), 86-93. https://doi.org/10.69088/2023/CRSS2

Christensen, A. I., Lau, C. J., Kristensen, P. L., Johnsen, S. B., Wingstrand, A., Friis, K., ... & Andreasen, A. H. (2022). The Danish National Health Survey: Study design, response rate and respondent characteristics in 2010, 2013 and 2017. Scandinavian journal of public health, 50(2), 180-188. https://doi.org/10.1177/1403494820966534

Chumphong, O., Srimai, S., & Potipiroon, W. (2020). The resource-based view, dynamic capabilities and SME performance for SMEs to become smart enterprises. ABAC ODI Journal Vision. Action. Outcome, 7(2), 129. http://www.assumptionjournal.au.edu/index

Ciacci, A., & Penco, L. (2024). Business model innovation: harnessing big data analytics and digital transformation in hostile environments. Journal of Small Business and Enterprise Development, 31(8), 22-46. https://doi.org/10.1108/JSBED-10-2022-0424

Çini, M. A., Erdirençelebi, M., & Akman, A. Z. (2023a). The Effect of Organisation Employees' Perspective on Digital Transformation on Their Technostress Levels and Performance: A Public Institution Example. Central European Business Review, 12(4), 33–57. https://doi.org/10.18267/j.cebr.331

Cirillo, V., Fanti, L., Mina, A., & Ricci, A. (2023). The adoption of digital technologies: Investment, skills, work organisation. Structural Change and Economic Dynamics, 66, 89-105. https://doi.org/10.1016/j.strueco.2023.04.011

Cipriano, M., & Za, S. (2024). Non-profit organisations in the digital age: A research agenda for supporting the development of a digital transformation

© COPYRIGHT UPM

strategy. Journal of Information Technology, 39(4), 732-755. https://doi.org/10.1177/02683962231219515

Colbert, A., Yee, N., & George, G. (2016). The Digital Workforce and the Workplace of the Future. Academy of Management Journal, 59(3), 731–739. https://doi.org/10.5465/amj.2016.4003

Colli, M., Stingl, V., & Waehrens, B. V. (2022). Making or breaking the business case of digital transformation initiatives: The key role of learnings. Journal of Manufacturing Technology Management, 33(1), 41–60. https://doi.org/10.1108/JMTM-08-2020-0330

Collins, C. J. (2021a). Expanding the resource based view model of strategic human resource management. The International Journal of Human Resource Management, 32(2), 331–358. https://doi.org/10.1080/09585192.2019.1711442

Collins, C., & Kehoe, R. (2017). Examining Strategic Fit and Misfit in the Management of Knowledge Workers. ILR Review, 70(2), 308–335. https://doi.org/10.1177/0019793916654481

Corbetta, P. (2003). Social Research: Theory, Methods and Techniques. SAGE Publications, Ltd. https://doi.org/10.4135/9781849209922

Cordeiro, M., Puig, F., & Ruiz-Fernández, L. (2023). Realizing dynamic capabilities and organizational knowledge in effective innovations: the capabilities typological map. Journal of Knowledge Management, 27(10), 2581-2603. https://doi.org/10.1108/JKM-02-2022-0080

Correia, R. J., Dias, J. G., & Teixeira, M. S. (2021). Dynamic capabilities and competitive advantages as mediator variables between market orientation and business performance. Journal of Strategy and Management, 14(2), 187–206. https://doi.org/10.1108/JSMA-12-2019-0223

Cortellazzo, L., Bruni, E., & Zampieri, R. (2019). The Role of Leadership in a Digitalized World: A Review. Frontiers in Psychology, 10, 1938. https://doi.org/10.3389/fpsyg.2019.01938

Cortina, J. M., Chen, G., & Dunlap, W. P. (2001). Testing Interaction Effects in LISREL: Examination and Illustration of Available Procedures. Organisational Research Methods, 4(4), 324–360. https://doi.org/10.1177/109442810144002

Costa Melo, Dr. I., Queiroz, G. A., Alves Junior, P. N., Sousa, T. B. D., Yushimito, W. F., & Pereira, J. (2023). Sustainable digital transformation in small and medium enterprises (SMEs): A review on performance. Heliyon, 9(3), e13908. https://doi.org/10.1016/j.heliyon.2023.e13908

Costa, V., & Sarmento (2019). Confirmatory factor analysis--a case study. arXiv preprint arXiv:1905.05598. https://doi.org/10.48550/arxiv.1905.05598

© COPYRIGHT UPM

Creemers, R., Dorwart, H., Neville, K., Schaefer, K., Costigan, J., & Webster, G. (2021). 14th Five-Year Plan for National Informatization.

Crook, T. R., Jr, D. J. K., Combs, J. G., & Todd, S. Y. (2008). Strategic resources and performance: A meta-analysis. https://doi.org/10.1002/smj.703

Cristache, N., Pricopoaia, O., Nastase, M., Dobrea, R. C., Ibinceanu, M. O., & Coroban, L. (2024). The Impact of Digitalisation on The Performance of Companies at National Level. Economic Computation & Economic Cybernetics Studies & Research, 58(2). https://doi.org/10.24818/18423264/58.2.24.11

Cui, Y., Jiao, H., & Zhao, G. (2024). A Heuristic for All? A Multiple Needs Approach to Fairness Heuristic Formation in Digital Transformation in Chinese Work Organisations. IEEE Transactions on Engineering Management, 1–13. https://doi.org/10.1109/TEM.2020.3045415

Da Silva, R. R., Larieira, C. L. C., Meirelles, F. D. S., & Dos Reis, A. M. P. (2023). ORGANISATIONAL AMBIDEXTERITY: A PATH TO DIGITAL TRANSFORMATION IN SMALL AND MEDIUM ENTERPRISES. REVISTA CIENTÍFICA COGNITIONIS, 6(2), 480–504. https://doi.org/10.38087/2595.8801.207

Das, S., Kundu, A., & Bhattacharya, A. (2020). Technology Adaptation and Survival of SMEs: A Longitudinal Study of Developing Countries. Technology Innovation Management Review, 10(6), 64–72. https://doi.org/10.22215/timreview/1369

Dayioglu, M., Küskü, F., & Cetindamar, D. (2024). The Impact of Business Environmental Factors on Performance Through Strategic Agility and Business Model Innovation: An Analysis Based on Dynamic Capabilities Theory. IEEE Transactions on Engineering Management, 1–38. https://doi.org/10.1109/TEM.2024.3353734

de Araujo, L. M., Priadana, S., Paramarta, V., & Sunarsi, D. (2021). Digital leadership in business organisations. International Journal of Educational Administration, Management, and Leadership, 45-56. https://doi.org/10.51629/ijeamal.v2i1.18

Dejardin, M., Raposo, M. L., Ferreira, J. J., Fernandes, C. I., Veiga, P. M., & Farinha, L. (2023). The impact of dynamic capabilities on SME performance during COVID-19. Review of Managerial Science, 17(5), 1703-1729. https://doi.org/10.1007/s11846-022-00569-x

De Mori, C., Batalha, M. O., & Alfranca, O. (2016). A model for measuring technology capability in the agrifood industry companies. British Food Journal, 118(6), 1422–1461. https://doi.org/10.1108/BFJ-10-2015-0386

Demartini, M. C., & Beretta, V. (2020). Intellectual capital and SMEs' performance: A structured literature review. Journal of Small Business Management, 58(2), 288–332. https://doi.org/10.1080/00472778.2019.1659680

© COPYRIGHT UPM

DeSimone, J. A., Harms, P. D., & DeSimone, A. J. (2015). Best practice recommendations for data screening: DATA SCREENING. Journal of Organisational Behaviour, 36(2), 171–181. https://doi.org/10.1002/job.1962

Dhir, S. (2021). The changing nature of work, leadership, and organisational culture in future ready organisations. https://doi.org/10.51629/ijeamal.v2i1.18

Diamantidis, A. D., & Chatzoglou, P. (2019). Factors affecting employee performance: An empirical approach. International Journal of Productivity and Performance Management, 68(1), 171–193. https://doi.org/10.1108/IJPPM-01-2018-0012

Díaz-Arancibia, J., Hochstetter-Diez, J., Bustamante-Mora, A., Sepúlveda-Cuevas, S., Albayay, I., & Arango-López, J. (2024). Navigating digital transformation and technology adoption: A literature review from small and medium-sized enterprises in developing countries. Sustainability, 16(14), 5946. https://doi.org/10.3390/su16145946

Ding, X., Sheng, Z., Appolloni, A., Shahzad, M., & Han, S. (2024). Digital transformation, ESG practice, and total factor productivity. Business Strategy and the Environment, 33(5), 4547-4561. https://doi.org/10.1002/bse.3718

Do, H., Budhwar, P., Shipton, H., Nguyen, H. D., & Nguyen, B. (2022). Building organizational resilience, innovation through resource-based management initiatives, organizational learning and environmental dynamism. Journal of business research, 141, 808-821. https://doi.org/10.1016/j.jbusres.2021.11.090

Dosi, G., Nelson, R. R., & Winter, S. G. (Eds.). (2000). The nature and dynamics of organisational capabilities. Oxford University Press. https://doi.org/10.1093/0199248540.001.0001

Drnevich, P. L., & Kriauciunas, A. P. (2011). Clarifying the conditions and limits of the contributions of ordinary and dynamic capabilities to relative firm performance. Strategic Management Journal, 32(3), 254–279. https://doi.org/10.1002/smj.882

Duan, S. X., Deng, H., & Wibowo, S. (2023). Exploring the impact of digital work on work–life balance and job performance: A technology affordance perspective. Information Technology & People, 36(5), 2009–2029. https://doi.org/10.1108/ITP-01-2021-0013

Dube,L., & Paré, G. (2003). Rigor in information systems positivist case research: current practices, trends, and recommendations. MIS quarterly, 597-636. https://doi.org/10.2307/30036550

Dubey, R., Bryde, D. J., Blome, C., Dwivedi, Y. K., Childe, S. J., & Foropon, C. (2024). Alliances and digital transformation are crucial for benefiting from dynamic supply chain capabilities during times of crisis: A multi-method study. International Journal of Production Economics, 269, 109166. https://doi.org/10.1016/j.ijpe.2024.109166

© COPYRIGHT UPM

Durek, V., Kadoic, N., & Begicevic Redep, N. (2018). Assessing the digital maturity level of higher education institutions. 2018 41st International Convention on Information and Communication Technology, Electronics and Microelectronics (MIPRO), 0671–0676. https://doi.org/10.23919/MIPRO.2018.8400126

Dwikat, S. Y., Arshad, D., & Mohd Shariff, M. N. (2023). Effect of Competent Human Capital, Strategic Flexibility and Turbulent Environment on Sustainable Performance of SMEs in Manufacturing Industries in Palestine. Sustainability, 15(6), 4781. https://doi.org/10.3390/su15064781

Kurtmollaiev, S. (2020). Dynamic capabilities and where to find them. Journal of Management Inquiry, 29(1), 3-16. https://doi.org/10.1177/1056492617730126

Eberl, J. K., & Drews, P. (2021). Digital Leadership – Mountain or Molehill? A Literature Review. In F. Ahlemann, R. Schütte, & S. Stieglitz (Eds.), Innovation Through Information Systems (Vol. 48, pp. 223–237). Springer International Publishing. https://doi.org/10.1007/978-3-030-86800-0_17

Ebert, C., & Duarte, C. H. C. (2018). Digital Transformation. IEEE Software, 35(4), 16–21. https://doi.org/10.1109/MS.2018.2801537

Edu, S. A., Agoyi, M., & Agozie, D. Q. (2020). Integrating Digital Innovation Capabilities Towards Value Creation: A Conceptual View. International Journal of Intelligent Information Technologies, 16(4), 37–50. https://doi.org/10.4018/IJIIT.2020100103

Edwards, J. R., & Parry, M. E. (2018). On the Use of Spline Regression in the Study of Congruence in Organisational Research. Organisational Research Methods, 21(1), 68–110. https://doi.org/10.1177/1094428117715067

Eikelenboom 和 de Jong—2019—The impact of dynamic capabilities on the sustaina.pdf. (n.d.).

Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: What are they? Strategic Management Journal, 21(10–11), 1105–1121. https://doi.org/10.1002/1097-0266(200010/11)21:10/11<1105::AID-SMJ133>3.0.CO;2-E

El Sawy, O. A., Kræmmergaard, P., Amsinck, H., & Vinther, A. L. (2020). How LEGO Built the Foundations and Enterprise Capabilities for Digital Leadership. In R. D. Galliers, D. E. Leidner, & B. Simeonova (Eds.), Strategic Information Management (5th ed., pp. 174–201). Routledge. https://doi.org/10.4324/9780429286797-8

Elisa, Z. P., Nabella, S. D., & Sari, D. P. (2022). The influence of role perception, human resource development, and compensation on employee performance Universitas Ibnu Sina. Enrichment: Journal of Management, 12(3), 1606-1612. https://doi.org/10.35335/enrichment.v12i3.626

© COPYRIGHT UPM

Eller, R., Alford, P., Kallmünzer, A., & Peters, M. (2020). Antecedents, consequences, and challenges of small and medium-sized enterprise digitalisation. Journal of Business Research, 112, 119–127. https://doi.org/10.1016/j.jbusres.2020.03.004

Emiliano De Souza, D., Favoretto, C., & Carvalho, M. M. (2022). Knowledge Management, Absorptive and Dynamic Capacities and Project Success: A Review and Framework. Engineering Management Journal, 34(1), 50–69. https://doi.org/10.1080/10429247.2020.1840876

Erhan, T., Uzunbacak, H. H., & Aydin, E. (2022). From conventional to digital leadership: Exploring digitalisation of leadership and innovative work behaviour. Management Research Review, 45(11), 1524–1543. https://doi.org/10.1108/MRR-05-2021-0338

Erro-Garcés, A., & Aramendia-Muneta, M. E. (2023). The role of human resource management practices on the results of digitalisation. From Industry 4.0 to Industry 5.0. Journal of Organisational Change Management, 36(4), 585–602. https://doi.org/10.1108/JOCM-11-2021-0354

Eső, P., Nocke, V., & White, L. (2010). Competition for scarce resources. The RAND Journal of Economics, 41(3), 524–548. https://doi.org/10.1111/j.1756-2171.2010.00110.x

Etikan, I. (2016). Comparison of Convenience Sampling and Purposive Sampling. American Journal of Theoretical and Applied Statistics, 5(1), 1. https://doi.org/10.11648/j.ajtas.20160501.11

Executive Agency for Small and Medium sized Enterprises., LE Europe., CARSA., PwC., & DIW econ. (2021). Annual report on European SMEs 2020/2021: Digitalisation of SMEs. Publications Office. https://data.europa.eu/doi/10.2826/56865

F. Hair Jr, J., Sarstedt, M., Hopkins, L., & G. Kuppelwieser, V. (2014a). Partial least squares Structural Equation Modelling (PLS-SEM): An emerging tool in business research. European Business Review, 26(2), 106–121. https://doi.org/10.1108/EBR-10-2013-0128

Fabrizio, C. M., Kaczam, F., De Moura, G. L., Da Silva, L. S. C. V., Da Silva, W. V., & Da Veiga, C. P. (2022). Competitive advantage and dynamic capability in small and medium-sized enterprises: A systematic literature review and future research directions. Review of Managerial Science, 16(3), 617–648. https://doi.org/10.1007/s11846-021-00459-8

Fainshmidt, S., Pezeshkan, A., Lance Frazier, M., Nair, A., & Markowski, E. (2016). Dynamic Capabilities and Organisational Performance: A Meta-Analytic Evaluation and Extension: Dynamic Capabilities and Organisational Performance. Journal of Management Studies, 53(8), 1348–1380. https://doi.org/10.1111/joms.12213

© COPYRIGHT UPM

Farzaneh, M., Ghasemzadeh, P., Nazari, J. A., & Mehralian, G. (2021). Contributory role of dynamic capabilities in the relationship between organisational learning and innovation performance. European Journal of Innovation Management, 24(3), 655–676. https://doi.org/10.1108/EJIM-12-2019-0355

Ferreira, J., Cardim, S., & Coelho, A. (2021a). Dynamic Capabilities and Mediating Effects of Innovation on the Competitive Advantage and Firm's Performance: The Moderating Role of Organisational Learning Capability. Journal of the Knowledge Economy, 12(2), 620–644. https://doi.org/10.1007/s13132-020-00655-z

Ferreira, J., Coelho, A., & Moutinho, L. (2020). Dynamic capabilities, creativity and innovation capability and their impact on competitive advantage and firm performance: The moderating role of entrepreneurial orientation. Technovation, 92–93, 102061. https://doi.org/10.1016/j.technovation.2018.11.004

Ferreira, J. J. M., Fernandes, C. I., & Mota Veiga, P. (2023). The role of entrepreneurial ecosystems in the SME internationalization. Journal of Business Research, 157, 113603. https://doi.org/10.1016/j.jbusres.2022.113603

Fong, M., Zhao, K., & Smillie, L. D. (2021). Personality and competitiveness: Extraversion, agreeableness, and their aspects, predict self-reported competitiveness and competitive bidding in experimental auctions. Personality and Individual Differences, 169, 109907. https://doi.org/10.1016/j.paid.2020.109907

Fonseca, T., De Faria, P., & Lima, F. (2019). Human capital and innovation: The importance of the optimal organisational task structure. Research Policy, 48(3), 616–627. https://doi.org/10.1016/j.respol.2018.10.010

Fornell, C., & Larcker, D. F. (1981a). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. Journal of Marketing Research, 18(1), 39. https://doi.org/10.2307/3151312

Fousiani, K., & Wisse, B. (2022). Effects of Leaders' Power Construal on Leader-Member Exchange: The Moderating Role of Competitive Climate at Work. Journal of Leadership & Organisational Studies, 29(3), 306–324. https://doi.org/10.1177/15480518221075229

Fu, F., Zha, W., & Zhou, Q. (2023a). The Impact of Enterprise Digital Capability on Employee Sustainable Performance: From the Perspective of Employee Learning. Sustainability, 15(17), 12897. https://doi.org/10.3390/su151712897

Gao, P., & Gao, Y. (2024). How Does Digital Leadership Foster Employee Innovative Behaviour: A Cognitive–Affective Processing System Perspective. Behavioural Sciences, 14(5), 362. https://doi.org/10.3390/bs14050362

Garavan, T., Shanahan, V., Carbery, R., & Watson, S. (2016). Strategic human resource development: Towards a conceptual framework to understand its contribution to dynamic capabilities. Human Resource Development

International, 19(4), 289–306. https://doi.org/10.1080/13678868.2016.1169765

Garcia, S. M., Reese, Z. A., & Tor, A. (2020). Social Comparison Before, During, and After the Competition. In J. Suls, R. L. Collins, & L. Wheeler (Eds.), Social Comparison, Judgment, and Behaviour (1st ed., pp. 105–142). Oxford University PressNew York. https://doi.org/10.1093/oso/9780190629113.003.0005

Garmaki, M., Gharib, R. K., & Boughzala, I. (2023). Big data analytics capability and contribution to firm performance: The mediating effect of organisational learning on firm performance. Journal of Enterprise Information Management, 36(5), 1161–1184. https://doi.org/10.1108/JEIM-06-2021-0247

Gashaw, M., Yitayal, M. M., Zemed, A., Nigatu, S. G., Kasaw, A., Belay, D. G., ... & Janakiraman, B. (2022). Level of activity limitations and predictors in women with pregnancy-related pelvic girdle pain: Prospective cross-sectional study. Annals of Medicine and Surgery, 78, 103754. https://doi.org/10.1016/j.amsu.2022.103754

Gerhart, B., & Feng, J. (2021). The Resource-Based View of the Firm, Human Resources, and Human Capital: Progress and Prospects. Journal of Management, 47(7), 1796–1819. https://doi.org/10.1177/0149206320978799

Georgescu, I., Bocean, C. G., Vărzaru, A. A., Rotea, C. C., Mangra, M. G., & Mangra, G. I. (2024). Enhancing organizational resilience: The transformative influence of strategic human resource management practices and organizational culture. Sustainability, 16(10), 4315. https://doi.org/10.3390/su16104315

Ghasemzadeh, P., Rezayat Sorkhabadi, S. M., Kebriaeezadeh, A., Nazari, J. A., Farzaneh, M., & Mehralian, G. (2022). How does organisational learning contribute to corporate social responsibility and innovation performance? The dynamic capability view. Journal of Knowledge Management, 26(10), 2579–2601. https://doi.org/10.1108/JKM-01-2021-0069

Ghafoori, A., Gupta, M., Merhi, M. I., Gupta, S., & Shore, A. P. (2024). Toward the role of organizational culture in data-driven digital transformation. International Journal of Production Economics, 271, 109205. https://doi.org/10.1016/j.ijpe.2024.109205

Ghosh, K., Dohan, M. S., Veldandi, H., & Garfield, M. (2023). Digital Transformation in Healthcare: Insights on Value Creation. Journal of Computer Information Systems, 63(2), 449–459. https://doi.org/10.1080/08874417.2022.2070798

Gillani, F., Chatha, K. A., Jajja, S. S., Cao, D., & Ma, X. (2024). Unpacking Digital Transformation: Identifying key enablers, transition stages and digital archetypes. Technological Forecasting and Social Change, 203, 123335. https://doi.org/10.10.1016/j.techfore.2024.123335

Gilli, K., Nippa, M., & Knappstein, M. (2023). Leadership competencies for digital transformation: An exploratory content analysis of job advertisements. German

© COPYRIGHT UPM

Journal of Human Resource Management: Zeitschrift Für Personalforschung, 37(1), 50–75. https://doi.org/10.1177/23970022221087252

Girod, S. J. G., & Whittington, R. (2017). Reconfiguration, restructuring and firm performance: Dynamic capabilities and environmental dynamism: Reconfiguration, Restructuring and Firm Performance: Dynamic Capabilities and Environmental Dynamism. Strategic Management Journal, 38(5), 1121–1133. https://doi.org/10.1002/smj.2543

Gökalp, E., & Martinez, V. (2021a). Digital transformation capability maturity model enabling the assessment of industrial manufacturers. Computers in Industry, 132, 103522. https://doi.org/10.1016/j.compind.2021.103522

González-Varona, J., López-Paredes, A., Poza, D., & Acebes, F. (2021). Building and development of an organisational competence for digital transformation in SMEs. Journal of Industrial Engineering and Management, 14(1), 15. https://doi.org/10.3926/jiem.3279

Gradillas, M., & Thomas, L. D. (2025). Distinguishing digitization and digitalization: A systematic review and conceptual framework. Journal of Product Innovation Management, 42(1), 112-143. https://doi.org/10.1111/jpim.12690

Grant, A. M., & Shandell, M. S. (2022). Social Motivation at Work: The Organisational Psychology of Effort for, Against, and with Others. Annual Review of Psychology, 73(1), 301–326. https://doi.org/10.1146/annurev-psych-060321-033406

Grant, R. M. (1991). The resource-based theory of competitive advantage: implications for strategy formulation. California management review, 33(3), 114-135. https://doi.org/10.1016/B978-0-7506-7088-3.50004-8

Green, S. B. (1991). How Many Subjects Does It Take To Do A Regression Analysis. Multivariate Behavioural Research, 26(3), 499–510. https://doi.org/10.1207/s15327906mbr2603_7

Greeven, C. S., & Williams, S. P. (2022). Enterprise collaboration systems: Addressing adoption challenges and the shaping of sociotechnical systems. International Journal of Information Systems and Project Management, 5(1), 5–23. https://doi.org/10.12821/ijispm050101

Grigorescu, A., Pelinescu, E., Ion, A. E., & Dutcas, M. F. (2021). Human Capital in Digital Economy: An Empirical Analysis of Central and Eastern European Countries from the European Union. Sustainability, 13(4), 2020. https://doi.org/10.3390/su13042020

Gu, M., Zhang, Y., Li, D., & Huo, B. (2023a). The effect of high-involvement human resource management practices on supply chain resilience and operational performance. Journal of Management Science and Engineering, 8(2), 176–190. https://doi.org/10.1016/j.jmse.2022.12.001

© COPYRIGHT UPM

Guest, D. E. (2011). Human resource management and performance: Still searching for some answers: Human Resource Management and Performance. Human Resource Management Journal, 21(1), 3–13. https://doi.org/10.1111/j.1748-8583.2010.00164.x

Gunawan, A., Azzahroh, K., Tajib, E., & Aseanty, D. (2022). The Role of Job Satisfaction in Mediating the Effect of Organisational Culture and Organisational Learning on Employee Performance at PT. Techno Motor Indonesia. Proceedings of the First Lekantara Annual Conference on Public Administration, Literature, Social Sciences, Humanities, and Education, LePALISSHE 2021, August 3, 2021, Malang, Indonesia. Proceedings of the First Lekantara Annual Conference on Public Administration, Literature, Social Sciences, Humanities, and Education, LePALISSHE 2021, August 3, 2021, Malang, Indonesia, Malang, Indonesia. https://doi.org/10.4108/eai.3-8-2021.2315143

Guo, J., Zhou, S., Chen, J., & Chen, Q. (2021). How information technology capability and knowledge integration capability interact to affect business model design:A polynomial regression with response surface analysis. Technological Forecasting and Social Change, 170, 120935. https://doi.org/10.1016/j.techfore.2021.120935

Gupta, G., & Bose, I. (2022). Digital transformation in entrepreneurial firms through information exchange with operating environment. Information & Management, 59(3), 103243. https://doi.org/10.1016/j.im.2019.103243

Gutierrez-Gutierrez, L. J., Barrales-Molina, V., & Kaynak, H. (2018). The role of human resource-related quality management practices in new product development: A dynamic capability perspective. International Journal of Operations & Production Management, 38(1), 43–66. https://doi.org/10.1108/IJOPM-07-2016-0387

Hadi Putra, P. O., & Santoso, H. B. (2020). Contextual factors and performance impact of e-business use in Indonesian small and medium enterprises (SMEs). Heliyon, 6(3), e03568. https://doi.org/10.1016/j.heliyon.2020.e03568

Hadi, S., & Baskaran, S. (2021). Examining sustainable business performance determinants in Malaysia upstream petroleum industry. Journal of Cleaner Production, 294, 126231. https://doi.org/10.1016/j.jclepro.2021.126231

Hai, T. N., Van, Q. N., & Thi Tuyet, M. N. (2021). Digital Transformation: Opportunities and Challenges for Leaders in the Emerging Countries in Response to Covid-19 Pandemic. Emerging Science Journal, 5, 21–36. https://doi.org/10.28991/esj-2021-SPER-03

Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., & Thiele, K. O. (2017). Mirror, mirror on the wall: A comparative evaluation of composite-based Structural Equation Modelling methods. Journal of the Academy of Marketing Science, 45(5), 616–632. https://doi.org/10.1007/s11747-017-0517-x

© COPYRIGHT UPM

Hair Jr, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., Ray, S., ... & Ray, S. (2021). An introduction to structural equation modeling. Partial least squares structural equation modeling (PLS-SEM) using R: a workbook, 1-29. https://doi.org/10.1007/978-3-030-80519-7_1

Hai-Ninh, D., Hoang, N. Y. N., & Do, N. B. (2024). Improving business performance for SMEs: The power of Co-innovation, and business networks resilience in the Covid-19 pandemic. International Journal of Electronic Commerce Studies, 15(1), 1-24. https://doi.org/10.7903/ijecs.2290

Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organisation as a reflection of its top managers. Academy of management review, 9(2), 193-206. https://doi.org/10.2307/258434

Handley, C., & Mathew, S. (2020). Human large-scale cooperation as a product of competition between cultural groups. Nature Communications, 11(1), 702. https://doi.org/10.1038/s41467-020-14416-8

Haris,N., Jamaluddin, J., & Usman, E. (2023). The effect of organisational culture, competence and motivation on the SMEs performance in the Covid-19 post pandemic and digital era. Journal of Industrial Engineering & Management Research, 4(1), 29-40. https://doi.org/10.2307/30036550

Hartono, H., & Halim, E. (2020). The Effect of Digital Capability on Competitiveness through Digital Innovation of E-Travel Business in Indonesia. 2020 International Conference on Information Management and Technology (ICIMTech), 615–620. https://doi.org/10.1109/ICIMTech50083.2020.9211228

Hasyim, H., & Bakri, M. (2025). Work-Life Imbalance: Its Impact on Employee Motivation and Well-Being. Economics and Digital Business Review, 6(1). https://doi.org/10.33119/JMFS.2023.50.9

Hashim Alzadjali, A., Jibolu Adedeji, M., & Mohammad Jamil Adwan, O. (2023). Adopting a Learning Organisation Perspective for Improving Human Resources Service Quality During Digital Transformation. Journal of Chinese Human Resources Management, 14(3), 18–35. https://doi.org/10.47297/wspchrmWSP2040-800502.20231403

Hasibuan, J. S., Sari Nasution, A. S., & Sari, M. (2024). Organizational Citizenship Behavior as A Moderator in Employee Performance: A Study on Emotional Intelligence and Job Satisfaction. International Journal of Sustainable Development & Planning, 19(1). https://doi.org/10.18280/ijsdp.190135

Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical Mediation Analysis in the New Millennium. Communication Monographs, 76(4), 408–420. https://doi.org/10.1080/03637750903310360

Hayes, A. F., & Rockwood, N. J. (2017). Regression-based statistical mediation and moderation analysis in clinical research: Observations, recommendations, and implementation. Behaviour Research and Therapy, 98, 39–57. https://doi.org/10.1016/j.brat.2016.11.001

© COPYRIGHT UPM

Heale, R., & Twycross, A. (2015). Validity and reliability in quantitative studies. Evidence Based Nursing, 18(3), 66–67. https://doi.org/10.1136/eb-2015-102129

Helfat, C. E., & Martin, J. A. (2015). Dynamic managerial capabilities: Review and assessment of managerial impact on strategic change. Journal of management, 41(5), 1281-1312. https://doi.org/10.1177/0149206314561301

Helfat, C. E., & Peteraf, M. A. (2003). The dynamic resource-based view: Capability lifecycles. Strategic Management Journal, 24(10), 997–1010. https://doi.org/10.1002/smj.332

Helfat, C. E., & Peteraf, M. A. (2009). Understanding dynamic capabilities: Progress along a developmental path. Strategic Organisation, 7(1), 91–102. https://doi.org/10.1177/1476127008100133

Helfat, C. E., & Peteraf, M. A. (2015). Managerial cognitive capabilities and the microfoundations of dynamic capabilities. Strategic Management Journal, 36(6), 831–850. https://doi.org/10.1002/smj.2247

Hendrawan, S. A., Afdhal Chatra, Nurul Iman, Soemarno Hidayatullah, & Degdo Suprayitno. (2024). Digital Transformation in MSMEs: Challenges and Opportunities in Technology Management. Jurnal Informasi Dan Teknologi, 141–149. https://doi.org/10.60083/jidt.v6i2.551

Hendri, M. I. (2019). The mediation effect of job satisfaction and organisational commitment on the organisational learning effect of the employee performance. International Journal of Productivity and Performance Management, 68(7), 1208–1234. https://doi.org/10.1108/IJPPM-05-2018-0174

Henriette, E., Feki, M., & Boughzala, I. (2015). The Shape of Digital Transformation: A Systematic Literature Review. http://aisel. aisnet.org/mcis2015/10

Henseler, J., Dijkstra, T. K., Sarstedt, M., Ringle, C. M., Diamantopoulos, A., Straub, D. W., Ketchen, D. J., Hair, J. F., Hult, G. T. M., & Calantone, R. J. (2014). Common Beliefs and Reality About PLS: Comments on Rönkkö and Evermann (2013). Organisational Research Methods, 17(2), 182–209. https://doi.org/10.1177/1094428114526928

Hensellek, S. (2022). Digital Leadership: A Framework for Successful Leadership in the Digital Age. Journal of Media Management and Entrepreneurship, 2(1), 1–15. https://doi.org/10.4018/JMME.2020010104

Heredia, J., Castillo-Vergara, M., Geldes, C., Carbajal Gamarra, F. M., Flores, A., & Heredia, W. (2022). How do digital capabilities affect firm performance? The mediating role of technological capabilities in the “new normal”. Journal of Innovation & Knowledge, 7(2), 100171. https://doi.org/10.1016/j.jik.2022.100171

Hermano, V., & Martín-Cruz, N. (2016). The role of top management involvement in firms performing projects: A dynamic capabilities approach. Journal of

© COPYRIGHT UPM

Business Research, 69(9), 3447–3458. https://doi.org/10.1016/j.jbusres.2016.01.041

Hermina, U. N., & Yosepha, S. Y. (2019). THE MODEL OF EMPLOYEE PERFORMANCE. International Review of Management and Marketing, 9(3), 69–73. https://doi.org/10.32479/irmm.8025

Hernández-Linares, R., Kellermanns, F. W., & López-Fernández, M. C. (2021a). Dynamic capabilities and SME performance: The moderating effect of market orientation. Journal of Small Business Management, 59(1), 162–195. https://doi.org/10.1111/jsbm.12474

Hertzog, M. A. (2008). Considerations in determining sample size for pilot studies. Research in Nursing & Health, 31(2), 180–191. https://doi.org/10.1002/nur.20247

Herwina, Y. (2022). The Influence of Competence on Employee Performance: Investigation of Automotive Companie. International Journal of Management and Business Applied, 1(1), 1–8. https://doi.org/10.54099/ijmba.v1i1.97

Heubeck, T. (2023). Managerial capabilities as facilitators of digital transformation? Dynamic managerial capabilities as antecedents to digital business model transformation and firm performance. Digital Business, 3(1), 100053. https://doi.org/10.1016/j.digbus.2023.100053

Hidalgo-Peñate, A., Nieves, J., & Padrón-Robaina, V. (2022). The influence of employees' knowledge, organisational commitment, and culture on the innovativeness of vocational educational. Knowledge Management Research & Practice, 20(5), 755–766. https://doi.org/10.1080/14778238.2020.1774431

Hoang, D. V., Minh, T. T. K., Toan, N. Q., & Mai, V. T. (2024). Digital capabilities and innovation capabilities in Vietnamese SMEs. International Journal of Data and Network Science, 8(2), 1073–1084. https://doi.org/10.5267/j.ijdns.2023.12.001

Hooper, D., Couglan, J., & Mullen, M. R. (2007). Structural equation modelling: Guidelines for determining model fit. http://arrow.dit.ie/libart/4

Hooper, D. T., & Martin, R. (2008). Beyond personal Leader–Member Exchange (LMX) quality: The effects of perceived LMX variability on employee reactions. The Leadership Quarterly, 19(1), 20–30. https://doi.org/10.1016/j.leaqua.2007.12.002

Holtom, B., Baruch, Y., Aguinis, H., & A Ballinger, G. (2022). Survey response rates: Trends and a validity assessment framework. Human relations, 75(8), 1560-1584. https://doi.org/10.1177/00187267211070769

Hortovanyi, L., & Ferincz, A. (2015). The impact of ICT on learning on-the-job. The Learning Organisation, 22(1), 2–13. https://doi.org/10.1108/TLO-06-2014-0032

© COPYRIGHT UPM

Hossain, G. Md. S., Shuvo, S. K., Hasan, N., Zahan, I., Masud, A. A., & Rahman, Md. S. (2023). Nexus between human resource management practice and employees' attitudes and behaviour. International Journal of Research in Business and Social Science (2147- 4478), 12(2), 139–147. https://doi.org/10.20525/ijrbs.v12i2.2325

Hossain, M. A., Akter, S., & Yanamandram, V. (2021). Why doesn't our value creation payoff: Unpacking customer analytics-driven value creation capability to sustain competitive advantage. Journal of Business Research, 131, 287–296. https://doi.org/10.1016/j.jbusres.2021.03.063

Hossain, M. A., Agnihotri, R., Rushan, M. R. I., Rahman, M. S., & Sumi, S. F. (2022). Marketing analytics capability, artificial intelligence adoption, and firms' competitive advantage: Evidence from the manufacturing industry. Industrial Marketing Management, 106, 240-255. https://doi.org/10.1016/j.indmarman.2022.08.017

Hossain, S., Fernando, M., & Akter, S. (2025). Digital Leadership: Towards a Dynamic Managerial Capability Perspective of Artificial Intelligence-Driven Leader Capabilities. Journal of Leadership & Organizational Studies, 15480518251319624. https://doi.org/10.1177/15480518251319624

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural Equation Modeling: A Multidisciplinary Journal, 6(1), 1–55. https://doi.org/10.1080/10705519909540118

Hu, Y., Pan, Y., Yu, M., & Chen, P. (2024). Navigating digital transformation and knowledge structures: Insights for small and medium-sized enterprises. Journal of the Knowledge Economy, 1-34. https://doi.org/10.1007/s13132-024-01754-x

Huang, X. (2023). The roles of competition on innovation efficiency and firm performance: Evidence from the Chinese manufacturing industry. European Research on Management and Business Economics, 29(1), 100201. https://doi.org/10.1016/j.iedeen.2022.100201

Huber, G. P. (1991). Organisational Learning: The Contributing Processes and the Literatures. Organisation Science, 2(1), 88–115. https://doi.org/10.1287/orsc.2.1.88

Hung, R. Y. Y., Yang, B., Lien, B. Y.-H., McLean, G. N., & Kuo, Y.-M. (2010). Dynamic capability: Impact of process alignment and organisational learning culture on performance. Journal of World Business, 45(3), 285–294. https://doi.org/10.1016/j.jwb.2009.09.003

Huo, B., Han, Z., Chen, H., & Zhao, X. (2015). The effect of high-involvement human resource management practices on supply chain integration. International Journal of Physical Distribution & Logistics Management, 45(8), 716–746. https://doi.org/10.1108/IJPDLM-05-2014-0112

© COPYRIGHT UPM

Huy, Q., & Zott, C. (2019). Exploring the affective underpinnings of dynamic managerial capabilities: How managers' emotion regulation behaviours mobilize resources for their firms. Strategic Management Journal, 40(1), 28–54. https://doi.org/10.1002/smj.2971

Iacobucci, D. (2010). Structural equations modeling: Fit Indices, sample size, and advanced topics. Journal of Consumer Psychology, 20(1), 90–98. https://doi.org/10.1016/j.jcps.2009.09.003

Imani, S., Foroudi, P., Seyyedamiri, N., & Dehghani, N. (2020a). Improving employees' performance through internal marketing and organisational learning: Mediating role of organisational innovation in an emerging market. Cogent Business & Management, 7(1), 1762963. https://doi.org/10.1080/23311975.2020.1762963

Irangani, B. K., Liu, Z., Kumar, N., & Khanal, S. (2021). Effect of competitive psychological climate on unethical pro-team behaviour: The role of perceived insider status and transformational leadership. Management, 25(1), 1–27. https://doi.org/10.2478/manment-2019-0057

Ismail, A., Majid, A. H. A., Rahman, M. A., Jamaluddin, N. A., Susantiy, A. I., & Setiawati, C. I. (2021). Aligning Malaysian SMEs with the Megatrends: The Roles of HPWPs and Employee Creativity in Enhancing Malaysian SME Performance. Global Business Review, 22(2), 364–380. https://doi.org/10.1177/0972150918811236

Jackson, D. L., Gillaspy, J. A., & Purc-Stephenson, R. (2009). Reporting practices in confirmatory factor analysis: An overview and some recommendations. Psychological Methods, 14(1), 6–23. https://doi.org/10.1037/a0014694

Jackson, S. E., Schuler, R. S., & Jiang, K. (2014). An Aspirational Framework for Strategic Human Resource Management. Academy of Management Annals, 8(1), 1–56. https://doi.org/10.5465/19416520.2014.872335

Jakobs, L., Cano, A. K. S., & Rauch, E. (2024). Sustainability in SMEs: A comparative study to assess current status and setting targets for action. IFAC-PapersOnLine, 58(19), 836-841. https://doi.org/10.1016/j.facol.2024.09.188

Jahanshahi, A. A., Bhattacharjee, A., & Maghsoudi, T. (2021). Internal capabilities as the source of achieving competitive advantage in small-sized businesses. International Journal of Business Innovation and Research, 26(2), 141. https://doi.org/10.1504/IJBIR.2021.118446

Jean, R.-J. "Bryan", & Kim, D. (2020). Internet and SMEs' internationalization: The role of platform and website. Journal of International Management, 26(1), 100690. https://doi.org/10.1016/j.intman.2019.100690

Jia, C., Tang, X., & Kan, Z. (2020). Does the Nation Innovation System in China Support the Sustainability of Small and Medium Enterprises (SMEs) Innovation? Sustainability, 12(6), 2562. https://doi.org/10.3390/su12062562

© COPYRIGHT UPM

Jia, J., Xu, Y., & Li, W. (2024). A study on the strategic momentum of SMEs' digital transformation: Evidence from China. Technological Forecasting and Social Change, 200, 123038. https://doi.org/10.1016/j.techfore.2023.123038

Jiang, H., & Murmann, J. P. (2022). The Rise of China's Digital Economy: An Overview. Management and Organisation Review, 18(4), 790–802. https://doi.org/10.1017/mor.2022.32

Jiao, H., Alon, I., Koo, C. K., & Cui, Y. (2013a). When should organisational change be implemented? The moderating effect of environmental dynamism between dynamic capabilities and new venture performance. Journal of Engineering and Technology Management, 30(2), 188–205. https://doi.org/10.1016/j.jengtecman.2013.01.005

Johari, N. H. B., Mohamad, N. E. A., Rahman, N. R. A., & Chin, O. (2021). Factoring Tangible and Intangible Resources into Small Medium Enterprise Resilient Index (SMERi): A Novel Contribution for SME Sustainability. Global Business & Management Research, 13. https://doi.org/105171/2021.128184

Jones, G. R. (2010). Organisational theory, design, and change. https://doi.org/10.4236/ce.2010.115056

Joshanloo, M., & Jovanović, V. (2017). The factor structure of the mental health continuum-short form (MHC-SF) in Serbia: An evaluation using exploratory structural equation modeling. Journal of Mental Health, 26(6), 510–515. https://doi.10.1080/09638237.2016.1222058

Hair Jr, J. F., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: updated guidelines on which method to use. International Journal of Multivariate Data Analysis, 1(2), 107-123. https://doi.10.1504/IJMDA.2017.087624

Junaid, M., Zhang, Q., Cao, M., & Luqman, A. (2023). Nexus between technology enabled supply chain dynamic capabilities, integration, resilience, and sustainable performance: An empirical examination of healthcare organisations. Technological Forecasting and Social Change, 196, 122828. https://doi.org/10.1016/j.techfore.2023.122828

Jyoti, J., & Choudhary, R. (2024). Exploring ambidextrous human resource management and employee performance through the lens of managers' ambidextrous orientation and individual ambidexterity. *Employee Relations: The International Journal*, *46*(7), 1588-1623. https://doi.org/10.1108/ER-05-2023-0256

Kero, C. A., & Bogale, A. T. (2023). A Systematic Review of Resource-Based View and Dynamic Capabilities of Firms and Future Research Avenues. International Journal of Sustainable Development & Planning, 18(10). https://doi.org/10.18280/ijsdp.181016

Kaboub, F. (2008). Positivist paradigm. Encyclopaedia of counselling, 2(2), 343. https://doi.10.5539/jms.v4n3p79

© COPYRIGHT UPM

Kabue, L. W., & Kilika, J. M. (2016). Firm Resources, Core Competencies and Sustainable Competitive Advantage: An Integrative Theoretical Framework. Journal of Management and Strategy, 7(1), p98. https://doi.org/10.5430/jms.v7n1p98

Kafetzopoulos, D. (2022a). Performance management of SMEs: A systematic literature review for antecedents and moderators. International Journal of Productivity and Performance Management, 71(1), 289–315. https://doi.org/10.1108/IJPPM-07-2020-0349

Kafetzopoulos, D. (2023). Environmental dynamism and sustainability: The mediating role of innovation, strategic flexibility and HR development. Management Decision, 61(6), 1697–1716. https://doi.org/10.1108/MD-06-2022-0759

Kamasak, R. (2017). The contribution of tangible and intangible resources, and capabilities to a firm's profitability and market performance. European Journal of Management and Business Economics, 26(2), 252–275. https://doi.org/10.1108/EJMBE-07-2017-015

Karman, A., & Savanevičienė, A. (2021). Enhancing dynamic capabilities to improve sustainable competitiveness: Insights from research on organisations of the Baltic region. Baltic Journal of Management, 16(2), 318–341. https://doi.org/10.1108/BJM-08-2020-0287

Keding, C. (2021). Understanding the interplay of artificial intelligence and strategic management: Four decades of research in review. Management Review Quarterly, 71(1), 91–134. https://doi.org/10.1007/s11301-020-00181-x

Kee, D. M. H., & Rubel, M. R. B. (2021). Technology adaptation is on its way: The role of high involvement work practice. International Journal of Business Innovation and Research, 25(1), 35. https://doi.org/10.1504/IJBIR.2021.115011

Kennedy-Shaffer, L. (2019). Before $p < 0.05$ to Beyond $p < 0.05$: Using History to Contextualize p -Values and Significance Testing. The American Statistician, 73(sup1), 82–90. https://doi.org/10.1080/00031305.2018.1537891

Kero, C. A., & Bogale, A. T. (2023). A Systematic Review of Resource-Based View and Dynamic Capabilities of Firms and Future Research Avenues. International Journal of Sustainable Development and Planning, 18(10), 3137–3154. https://doi.org/10.18280/ijsdp.181016

Khan, K. U., Atlas, F., Ghani, U., Akhtar, S., & Khan, F. (2021a). Impact of intangible resources (dominant logic) on SMEs innovation performance, the mediating role of dynamic managerial capabilities: Evidence from China. European Journal of Innovation Management, 24(5), 1679–1699. https://doi.org/10.1108/EJIM-07-2020-0276

Khattak, M. S., & Ullah, R. (2021). The role of entrepreneurial orientation in tangible and intangible resource acquisition and new venture growth. Managerial and Decision Economics, 42(6), 1619–1637. https://doi.org/10.1002/mde.3331

Khaw, T. Y., Teoh, A. P., Abdul Khalid, S. N., & Letchmunan, S. (2022a). The impact of digital leadership on sustainable performance: A systematic literature review. Journal of Management Development, 41(9/10), 514–534. https://doi.org/10.1108/JMD-03-2022-0070

Khin, S., & Ho, T. C. (2019a). Digital technology, digital capability and organisational performance: A mediating role of digital innovation. International Journal of Innovation Science, 11(2), 177–195. https://doi.org/10.1108/IJIS-08-2018-0083

Khuntia, J., Saldanha, T., Kathuria, A., & Tanniru, M. R. (2024). Digital service flexibility: a conceptual framework and roadmap for digital business transformation. European Journal of Information Systems, 33(1), 61-79. https://doi.org/10.1080/0960085X.2022.2115410

King, R. B., McInerney, D. M., & Watkins, D. A. (2012a). Competitiveness is not that bad…at least in the East: Testing the hierarchical model of achievement motivation in the Asian setting. International Journal of Intercultural Relations, 36(3), 446–457. https://doi.org/10.1016/j.ijintrel.2011.10.003

KiRaz, A., Canpolat, O., Özkurt, C., Taşkin, H., & Sarp, E. (2020). Endüstri 4.0'ı etkileyen kriterlerin yapısal eşitlik modeli ile incelenmesi ve bir pilot uygulama. Gazi Üniversitesi Mühendislik Mimarlık Fakültesi Dergisi, 35(4), 2183–2196. https://doi.org/10.17341/gazimmfd.558947

Kirby, J. B., & Bollen, K. A. (2009). 10. Using Instrumental Variable Tests to Evaluate Model Specification in Latent Variable Structural Equation Models. Sociological Methodology, 39(1), 327–355. https://doi.org/10.1111/j.1467-9531.2009.01217.x

Klein, M. (2020). LEADERSHIP CHARACTERISTICS IN THE ERA OF DIGITAL TRANSFORMATION. Business & Management Studies: An International Journal, 8(1), 883–902. https://doi.org/10.15295/bmij.v8i1.1441

Knein, E., Greven, A., Bendig, D., & Brettel, M. (2020). Culture and cross-functional coopetition: The interplay of organisational and national culture. Journal of International Management, 26(2), 100731. https://doi.org/10.1016/j.intman.2019.100731

Kokot, K., Kokotec, I. D., & Calopa, M. K. (2021). Impact of Leadership on Digital Transformation. 2021 IEEE Technology & Engineering Management Conference - Europe (TEMSCON-EUR), 1–6. https://doi.org/10.1109/TEMSCON-EUR52034.2021.9488620

Kongolo, M. (2010). Job creation versus job shedding and the role of SMEs in economic development. African journal of business management, 4(11), 2288.

© COPYRIGHT UPM

Konopik, J., Jahn, C., Schuster, T., Hoßbach, N., & Pflaum, A. (2022). Mastering the digital transformation through organisational capabilities: A conceptual framework. Digital Business, 2(2), 100019. https://doi.org/10.1016/j.digbus.2021.100019

Kordab, M., Raudeliūnienė, J., & Meidutė-Kavaliauskienė, I. (2020). Mediating Role of Knowledge Management in the Relationship between Organisational Learning and Sustainable Organisational Performance. Sustainability, 12(23), 10061. https://doi.org/10.3390/su122310061

Kozlenkova, I. V., Samaha, S. A., & Palmatier, R. W. (2014). Resource-based theory in marketing. Journal of the Academy of Marketing Science, 42(1), 1–21. https://doi.org/10.1007/s11747-013-0336-7

Kraus, S., Durst, S., Ferreira, J. J., Veiga, P., Kailer, N., & Weinmann, A. (2022). Digital transformation in business and management research: An overview of the current status quo. International Journal of Information Management, 63, 102466. https://doi.org/10.1016/j.ijinfomgt.2021.102466

Kravariti, F., & Johnston, K. (2020). Talent management: A critical literature review and research agenda for public sector human resource management. Public Management Review, 22(1), 75–95. https://doi.org/10.1080/14719037.2019.1638439

Kuegler, M., Smolnik, S., & Kane, G. (2015). What's in IT for employees? Understanding the relationship between use and performance in enterprise social software. The Journal of Strategic Information Systems, 24(2), 90–112. https://doi.org/10.1016/j.jsis.2015.04.001

Kuncoro, W., & Suriani, W. O. (2018). Achieving sustainable competitive advantage through product innovation and market driving. Asia Pacific Management Review, 23(3), 186–192. https://doi.org/10.1016/j.apmrv.2017.07.006

Kurniasih, D., Setyoko, P. I., & Saputra, A. S. (2022). The Influence of Digital Electronic Performance, Competence and Motivation on Government Organisation Employees Performance During the Digital Era. Journal of Industrial Engineering & Management Research, 3(5), 86-99.

Kurtmollaiev, S. (2020). Dynamic Capabilities and Where to Find Them. Journal of Management Inquiry, 29(1), 3–16. https://doi.org/10.1177/1056492617730126

Kurniawan, T. A., Meidiana, C., Goh, H. H., Zhang, D., Othman, M. H. D., Aziz, F., ... & Ali, I. (2024). Unlocking synergies between waste management and climate change mitigation to accelerate decarbonization through circular-economy digitalization in Indonesia. Sustainable Production and Consumption, 46, 522-542. https://doi.org/10.1016/j.spc.2024.03.011

Kline, R. B. (2023). Principles and practice of structural equation modeling. Guilford publications.

© COPYRIGHT UPM

Lang, L. D., Behl, A., Phuong, N. N. D., Gaur, J., & Dzung, N. T. (2023). Toward SME digital transformation in the supply chain context: The role of structural social and human capital. International Journal of Physical Distribution & Logistics Management, 53(4), 448–466. https://doi.org/10.1108/IJPDLM-12-2021-0525

Lapersonne, A. H. H. (2013). Managing multiple sources of competitive advantage in a complex competitive environment. Future Studies Research Journal: Trends and Strategies, 5(2), 221-251. https://doi.org/10.24023/FutureJournal/2175-5825/2013.v5i2.120

Lathabhavan, R., & Kuppusamy, T. (2023). Examining the role of digital leadership and organisational resilience on the performance of SMEs during the COVID-19 pandemic. International Journal of Productivity and Performance Management. https://doi.org/10.1108/IJPPM-02-2023-0069

Lathabhavan, R., & Kuppusamy, T. (2024). Examining the role of digital leadership and organisational resilience on the performance of SMEs during the COVID-19 pandemic. International Journal of Productivity and Performance Management, 73(8), 2365-2384. https://doi.org/10.1108/IJPPM-02-2023-0069

Latif, R., Moaz, M., Iqbal, J., Tariq, A., & Shehzadi, M. (2024). Distinguish the Link between Human Resource Management Practices, Employee Job Satisfaction, and Turnover. pakistan journal of law,analysis and wisdom,3(12),124-133. https://doi.org/10.4236/objm.2020.81001

Laudien, S. M., Reuter, U., Sendra Garcia, F. J., & Botella-Carrubi, D. (2024). Digital advancement and its effect on business model design: Qualitative-empirical insights. Technological Forecasting and Social Change, 200, 123103. https://doi.org/10.1016/j.techfore.2023.123103

Law, M. M. S., Hills, P., & Hau, B. C. H. (2017). Engaging Employees in Sustainable Development – a Case Study of Environmental Education and Awareness Training in Hong Kong. Business Strategy and the Environment, 26(1), 84–97. https://doi.org/10.1002/bse.1903

Le, P. B., & Do, Y. H. (2024). Stimulating innovation performance through knowledge-oriented leadership and knowledge sharing: The moderating role of market turbulence. International Journal of Innovation Science, 16(3), 527–549. https://doi.org/10.1108/IJIS-08-2022-0166

Leão, P., & Da Silva, M. M. (2021a). Impacts of digital transformation on firms' competitive advantages: A systematic literature review. Strategic Change, 30(5), 421–441. https://doi.org/10.1002/jsc.2459

Lee, B. G. (2024). Foundations of Digital Transformation. In Understanding the Digital and AI Transformation (pp. 13-36). Singapore: Springer Nature Singapore. https:// doi.o rg/10.1007/978-981-96-0033-5_2

© COPYRIGHT UPM

Le, B. T., & Liu, X. (2024). Driving Social Sustainability and Resilience of SMEs Amidst Turbulence: The Role of Information Technology and Dynamic Capabilities.

Ledesma-Chaves, P., Arenas-Gaitán, J., & Garcia-Cruz, R. (2020). International expansion: Mediation of dynamic capabilities. Marketing Intelligence & Planning, 38(5), 637–652. https://doi.org/10.1108/MIP-05-2019-0269

Leech, N. L., & Onwuegbuzie, A. J. (2008). Qualitative data analysis: A compendium of techniques and a framework for selection for school psychology research and beyond. School Psychology Quarterly, 23(4), 587–604. https://doi.org/10.1037/1045-3830.23.4.587

Lei, J., Indiran, L., & Abdul Kohar, U. H. (2022a). The Digital Transformation of SMEs: The Difference between East and West in China. International Journal of Academic Research in Business and Social Sciences, 12(12), Pages 2509-2527. https://doi.org/10.6007/IJARBSS/v12-i12/15718

Lenka, S., Parida, V., & Wincent, J. (2017). Digitalisation Capabilities as Enablers of Value Co-Creation in Servitizing Firms. Psychology & Marketing, 34(1), 92–100. https://doi.org/10.1002/mar.20975

Lepore, D., Vecciolini, C., Micozzi, A., & Spigarelli, F. (2023). Developing technological capabilities for Industry 4.0 adoption: An analysis of the role of inbound open innovation in small and medium-sized enterprises. Creativity and Innovation Management, 32(2), 249–265. https://doi.org/10.1111/caim.12551

Leroy, H., Segers, J., van Dierendonck, D., & den Hartog, D. (2018a). Managing people in organisations: Integrating the study of HRM and leadership. Human Resource Management Review, 28(3), 249–257. https://doi.org/10.1016/j.hrmr.2018.02.002

Li, D., & Liu, J. (2014). Dynamic capabilities, environmental dynamism, and competitive advantage: Evidence from China. Journal of Business Research, 67(1), 2793–2799. https://doi.org/10.1016/j.jbusres.2012.08.007

Li, H., Wu, Y., Cao, D., & Wang, Y. (2021). Organisational mindfulness towards digital transformation as a prerequisite of information processing capability to achieve market agility. Journal of Business Research, 122, 700–712. https://doi.org/10.1016/j.jbusres.2019.10.036

Li, J. (Justin), Wong, I. A., & Kim, W. G. (2016). Effects of psychological contract breach on attitudes and performance: The moderating role of competitive climate. International Journal of Hospitality Management, 55, 1–10. https://doi.org/10.1016/j.ijhm.2016.02.010

Li, W., Liu, K., Belitski, M., Ghobadian, A., & O'Regan, N. (2016). E-Leadership through Strategic Alignment: An Empirical Study of Small- and Medium-sized Enterprises in the Digital Age. Journal of Information Technology, 31(2), 185–206. https://doi.org/10.1057/jit.2016.10

© COPYRIGHT UPM

Li, X., Zhou, Y., Xue, L., & Huang, L. (2016). Roadmapping for industrial emergence and innovation gaps to catch-up: A patent-based analysis of OLED industry in China. International Journal of Technology Management, 72(1-3), 105-143. https://doi.org/10.1504/IJTN.2016.080538

Li, Y., & Wang, X. (2022). A Study on the Correlations among Organisational Learning, Dynamic Capabilities, and Innovation Performance of Innovative Firms. Discrete Dynamics in Nature and Society, 2022, 1–17. https://doi.org/10.1155/2022/5082178

Li, Z., & Liu, Y. (2021). Research on the Spatial Distribution Pattern and Influencing Factors of Digital Economy Development in China. IEEE Access, 9, 63094–63106. https://doi.org/10.1109/ACCESS.2021.3075249

Liao, M., Li, S., & Liu, H. (2024). The impact mechanism of telework on job performance: a cross-level moderation model of digital leadership. Scientific Reports, 14(1), 12520. https://doi.org/10.1038/s41598-024-63518-6

Liboni, L. B., Cezarino, L. O., Alves, M. F. R., Chiappetta Jabbour, C. J., & Venkatesh, V. G. (2023a). Translating the environmental orientation of firms into sustainable outcomes: The role of sustainable dynamic capability. Review of Managerial Science, 17(4), 1125–1146. https://doi.org/10.1007/s11846-022-00549-1

Liboni, L. B., Cezarino, L. O., Alves, M. F. R., Chiappetta Jabbour, C. J., & Venkatesh, V. G. (2023b). Translating the environmental orientation of firms into sustainable outcomes: The role of sustainable dynamic capability. Review of Managerial Science, 17(4), 1125–1146. https://doi.org/10.1007/s11846-022-00549-1

Lim, W. M. (2023). The workforce revolution: Reimagining work, workers, and workplaces for the future. Global Business and Organisational Excellence, 42(4), 5–10. https://doi.org/10.1002/joe.22218

Limon, M. R., Vallente, J. P. C., Cajigal, A. R. V., Aquino, M. U., Aragon, J. A., & Acosta, R. L. (2022). Unmasking emerging issues in solid waste management: Knowledge and self-reported practices on the discarded disposable masks during the COVID-19 pandemic in the Philippines. Environmental Challenges, 6, 100435. https:// doi. org/10.1016/j. e nvc.2021. 100435

Lin, H.-C., & Lee, Y.-D. (2017). A Study of The Influence of Organisational Learning on Employees' Innovative Behaviour and Work Engagement by A Cross-Level Examination. EURASIA Journal of Mathematics, Science and Technology Education, 13(7). https://doi.org/10.12973/eurasia.2017.00738a

Lin, Y. (2014). Exploring the role of dynamic capabilities in firm performance under the resource-based view framework. Journal of Business Research. https://doi.org/10.1016/j.jbusres.2012.12.019

© COPYRIGHT UPM

Lin, Y., & Wu, L.-Y. (2014). Exploring the role of dynamic capabilities in firm performance under the resource-based view framework. Journal of Business Research, 67(3), 407–413. https://doi.org/10.1016/j.jbusres.2012.12.019

Liu, C.-H., Horng, J.-S., Chou, S.-F., Huang, Y.-C., & Chang, A. Y. (2018a). How to create competitive advantage: The moderate role of organisational learning as a link between shared value, dynamic capability, differential strategy, and social capital. Asia Pacific Journal of Tourism Research, 23(8), 747–764. https://doi.org/10.1080/10941665.2018.1492943

Liu, H., Li, J., & Liu, L. (2023). Linking Knowledge Heterogeneity with Project Performance in Digital Project Teams: The Role of Digital Capability and Knowledge Conversion. Journal of the Knowledge Economy. https://doi.org/10.1007/s13132-023-01353-2

Liu, Y., & Yu, Y. (2021). Business Model Adaptation of Small and Medium-Sized Information Technology Firms: The Role of Dynamic Capabilities. Journal of Global Information Management, 29(6), 1–15. https://doi.org/10.4018/JGIM.20211101.oa1

Liu, S. (2025). Research on Preferential Tax Policies Helping Innovation Alliance Empower New Productivity: Based on Science and Technology Innovation Enterprises in Anhui Province. Frontiers in Humanities and Social Sciences, 5(2), 222-233. https://doi.org/10.54691/8zqnxs98

Lopez-Cabrales, A., Bornay-Barrachina, M., & Diaz-Fernandez, M. (2017). Leadership and dynamic capabilities: The role of HR systems. Personnel Review, 46(2), 255–276. https://doi.org/10.1108/PR-05-2015-0146

Lubis, F., Rony, Z., & Santoso, B. (2020). Digital Leadership in Managing Employee Work Motivation (Case Study: Oil and Gas Industry in Indonesia). Proceedings of the Proceedings of the 2nd International Conference on Social Sciences, ICSS 2019, 5-6 November 2019, Jakarta, Indonesia. Proceedings of the 2nd International Conference on Social Sciences, ICSS 2019, 5-6 November 2019, Jakarta, Indonesia, Jakarta, Indonesia. https://doi.org/10.4108/eai.5-11-2019.2292490

Lumunon, D. F., Massie, J. D., & Trang, I. (2021). The effect of training, digital transformation, and work motivation on employee performance during the COVID-19 period: A study on culinary UMKM employees in Manado city. Central Asian Journal of Literature, Philosophy and Culture, 2(8), 22-37. https://doi.10.5267./j.ijdns.2022.10.006

Luo, G., & Tworek, K. (2022). E-leadership as a booster of employees' dynamic capabilities influence on job performance. Zeszyty Naukowe. Organizacja i Zarządzanie/Politechnika Śląska.Luo, M. (n.d.). The development of SMEs in China: Opportunities and Challenges.https://doi.10.29119/1641-3466.2022.155.16

Luo, R., & Zhou, N. (2022). Dynamic Evolution, Spatial Differences, and Driving Factors of China's Provincial Digital Economy. Sustainability, 14(15), 9376. https://doi:org/10.3390/su14159376

Lusiani, M., Abidin, Z., Fitrianingsih, D., Yusnita, E., Adiwinata, D., Rachmaniah, D., Fauzi, A., & Purwanto, A. (2020). Effect of Servant, Digital and Green Leadership toward Business Performance: Evidence from Indonesian Manufacturing. Systematic Reviews in Pharmacy, 11(11). https://doi:10.31838/srp.2020.11.192

Luthans, F., & Stewart, T. I. (1977). A general contingency theory of management. Academy of management Review, 2(2), 181-195. https://doi:10.5465/AMR.1977.4409038

Ma, L., Zhang, X., & Dong, L. (2023). Enhancing Sustainable Performance: The Innovative Strategy of Digital Transformation Leading Green Collaborative Management. Sustainability, 15(17), 13085. https://doi.org/10.3390/su151713085

Madhavan, M., Wangtueai, S., Sharafuddin, M. A., & Chaichana, T. (2022). The Precipitative Effects of Pandemic on Open Innovation of SMEs: A Scientometrics and Systematic Review of Industry 4.0 and Industry 5.0. Journal of Open Innovation: Technology, Market, and Complexity, 8(3), 152. https://doi.org/10.3390/joitmc8030152

Maier, A., Oehmen, J., & Vermaas, P. E. (2022). Introducing engineering systems design: A new engineering perspective on the challenges of our times. In Handbook of engineering systems design (pp. 1-30). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-030-46054-9_1-2

Makhloufi, L., Azbiya Yaacob, N., Laghouag, A. A., Ali Sahli, A., & Belaid, F. (2021). Effect of IT capability and intangible IT resources on sustainable competitive advantage: Exploring moderating and mediating effect of IT flexibility and core competency. Cogent Business & Management, 8(1), 1935665. https://doi.org/10.1080/23311975.2021.1935665

Makkonen, H., Pohjola, M., Olkkonen, R., & Koponen, A. (2014). Dynamic capabilities and firm performance in a financial crisis. Journal of Business Research, 67(1), 2707–2719. https://doi.org/10.1016/j.jbusres.2013.03.020

Manuti, A., Pastore, S., Scardigno, A. F., Giancaspro, M. L., & Morciano, D. (2015). Formal and informal learning in the workplace: A research review. International Journal of Training and Development, 19(1), 1–17. https://doi.org/10.1111/ijtd.12044

Manzoor, U., Baig, S. A., Hashim, M., Sami, A., Rehman, H. U., & Sajjad, I. (2022). The effect of supply chain agility and lean practices on operational performance: a resource-based view and dynamic capabilities perspective. The TQM Journal, 34(5), 1273-1297. https://doi.org/10.1108/TQM-01-2021-0006

© COPYRIGHT UPM

Mao, H., Liu, S., & Gong, Y. (2024). Balancing structural IT capabilities for organisational agility in digital transformation: A resource orchestration view. International Journal of Operations & Production Management, 44(1), 315–344. https://doi.org/10.1108/IJOPM-09-2022-0595

Marabelli, M., & Galliers, R. D. (2017). A reflection on information systems strategizing: The role of power and everyday practices. Information Systems Journal, 27(3), 347–366. https://doi.org/10.1111/isj.12110

Marcos-Cuevas, J., Nätti, S., Palo, T., & Baumann, J. (2016). Value co-creation practices and capabilities: Sustained purposeful engagement across B2B systems. Industrial Marketing Management, 56, 97–107. https://doi.org/10.1016/j.indmarman.2016.03.012

Marion, T. J., & Fixson, S. K. (2021). The Transformation of the Innovation Process: How Digital Tools are Changing Work, Collaboration, and Organisations in New Product Development*. Journal of Product Innovation Management, 38(1), 192–215. https://doi.org/10.1111/jpim.12547

Markovich, A., Efrat, K., & Raban, D. R. (2021). Dynamic capabilities: Interrelations and distinct effects on performance in low and high competitive intensity environments. Baltic Journal of Management, 16(4), 539–563. https://doi.org/10.1108/BJM-10-2020-0367

Massaro, M., Dumay, J., & Bagnoli, C. (2015). Where there is a will there is a way: IC, strategic intent, diversification and firm performance. Journal of Intellectual Capital, 16(3), 490–517. https://doi.org/10.1108/JIC-07-2014-0091

Matarazzo, M., Penco, L., Profumo, G., & Quaglia, R. (2021). Digital transformation and customer value creation in Made in Italy SMEs: A dynamic capabilities perspective. Journal of Business Research, 123, 642–656. https://doi.org/10.1016/j.jbusres.2020.10.033

Mathur, P. (2015). Achieving competitive advantage through employees. International Journal of Arts, Humanities and management studies, 1(9), 66-71.http://dx.doi.org/10.6007/IJAREMS/v11-i2/13335

McGarvey, R., Burch, P., & Matthews, J. M. (2016). Precision of systematic and random sampling in clustered populations: Habitat patches and aggregating organisms. Ecological Applications, 26(1), 233–248. https://doi.org/10.1890/14-1973

Meher, J. R., & Mishra, R. K. (2022). Examining the role of knowledge sharing on employee performance with a mediating effect of organisational learning. VINE Journal of Information and Knowledge Management Systems, 52(2), 205–223. https://doi.org/10.1108/VJIKMS-04-2020-0056

Mehta, A. M., & Ali, S. A. (2021). Dynamic managerial capabilities and sustainable market competencies: role of organisational climate. International Journal of Ethics and Systems, 37(2), 245-262. https://doi.org/10.1108/IJOES-07-2020-0121

© COPYRIGHT UPM

Melián-Alzola, L., Fernández-Monroy, M., & Hidalgo-Peñate, M. (2020). Information technology capability and organisational agility: A study in the Canary Islands hotel industry. Tourism Management Perspectives, 33, 100606. https://doi.org/10.1016/j.tmp.2019.100606

Melo, I. C., Queiroz, G. A., Junior, P. N. A., de Sousa, T. B., Yushimito, W. F., & Pereira, J. (2023). Sustainable digital transformation in small and medium enterprises (SMEs): A review on performance. Heliyon, 9(3). https://doi.org/10.1016/j.heliyon.2023.e13908

Mendillo, M. L., Santagata, S., Koeva, M., Bell, G. W., Hu, R., Tamimi, R. M., Fraenkel, E., Ince, T. A., Whitesell, L., & Lindquist, S. (2012). HSF1 Drives a Transcriptional Program Distinct from Heat Shock to Support Highly Malignant Human Cancers. Cell, 150(3), 549–562. https://doi.org/10.1016/j.cell.2012.06.031

Mendoza, N. F., Pertuz, L. D., Merlano, F. B., Hoyos, C. A. H., & Osorio, B. C. (2023). RELEVANCE OF INTELLECTUAL CAPITAL IN THE MANAGERIAL CAPABILITIES OF COMPANIES. Russian Law Journal, 11(4), 717-724. https://doi.org/10.7903/cmr.1045

Merín-Rodrigáñez, J., Dasí, À., & Alegre, J. (2024). Digital transformation and firm performance in innovative SMEs: The mediating role of business model innovation. Technovation, 134, 103027. https://doi.org/10.1016/j.technovation.2024.103027

Mihardjo, L. W. W., & Rukmana, R. A. (2019a). Intervening Role of Innovation Management on Relationship between Digital Leadership and Dynamic Capability Accelerated by Collaboration. International Journal of Innovation, 6(1). https://doi.105267/j.msl.2019.3.018

Mihardjo, L. W. W., & Rukmana, R. A. N. (2019c). Dynamic Capability, Market Orientation and Innovation Capability: The Role of Digital Leadership for Indonesia Telecommunication Firms in Facing Disruptive Era.https://doi.org/10.5267/j.msl.2019.5.024

Mihardjo, L. W. W., Sasmoko, S., Alamsjah, F., & Elidjen, E. (2019a). Digital Leadership Impacts on Developing Dynamic Capability and Strategic Alliance Based on Market Orientation. Polish Journal of Management Studies, 19(2), 285–297. https://doi.org/10.17512/pjms.2019.19.2.24

Mihardjo, L. W. W., Sasmoko, S., Alamsjah, F., & Elidjen, E. (2019b). Digital leadership role in developing business model innovation and customer experience orientation in industry 4.0. Management Science Letters, 1749–1762. https://doi.org/10.5267/j.msl.2019.6.015

Mihardjo, L. W. W., Sasmoko, S., Alamsyah, F., & Elidjen, E. (2019a). The influence of digital leadership on innovation management based on dynamic capability: Market orientation as a moderator. Management Science Letters, 1059–1070. https://doi.org/10.5267/j.msl.2019.3.018

Mikalef, P., Boura, M., Lekakos, G., & Krogstie, J. (2019). Big Data Analytics Capabilities and Innovation: The Mediating Role of Dynamic Capabilities and Moderating Effect of the Environment. British Journal of Management, 30(2), 272–298. https://doi.org/10.1111/1467-8551.12343

Mikalef, P., & Gupta, M. (2021). Artificial intelligence capability: Conceptualization, measurement calibration, and empirical study on its impact on organisational creativity and firm performance. Information & Management, 58(3), 103434. https://doi.org/10.1016/j.im.2021.103434

Mikalef, P., Krogstie, J., Pappas, I. O., & Pavlou, P. (2020). Exploring the relationship between big data analytics capability and competitive performance: The mediating roles of dynamic and operational capabilities. Information & Management, 57(2), 103169. https://doi.org/10.1016/j.im.2019.05.004

Mikalef, P., & Pateli, A. (2017). Information technology-enabled dynamic capabilities and their indirect effect on competitive performance: Findings from PLS-SEM and fsQCA. Journal of Business Research, 70, 1–16. https://doi.org/10.1016/j.jbusres.2016.09.004

Mikalef, P., Pateli, A., & Van De Wetering, R. (2021a). IT architecture flexibility and IT governance decentralisation as drivers of IT-enabled dynamic capabilities and competitive performance: The moderating effect of the external environment. European Journal of Information Systems, 30(5), 512–540. https://doi.org/10.1080/0960085X.2020.1808541

Montgomery, D. C., Peck, E. A., & Vining, G. G. (2021). Introduction to linear regression analysis. John Wiley & Sons.

Mohamad, A., Mohd Rizal, A., Kamarudin, S., & Sahimi, M. (2022). Exploring the Co-Creation of Small and Medium Enterprises, and Service Providers Enabled by Digital Interactive Platforms for Internationalization: A Case Study in Malaysia. Sustainability, 14(23), 16119. https://doi.org/10.3390/su142316119

Mohamed, S. M. (2022). Employee Performance as affected by the digital Training, the digital Leadership, and subjective wellbeing during COVID-19. Journal of Positive School Psychology, 540-553.

Mollah, M. A., Choi, J.-H., Hwang, S.-J., & Shin, J.-K. (2023a). Exploring a Pathway to Sustainable Organisational Performance of South Korea in the Digital Age: The Effect of Digital Leadership on IT Capabilities and Organisational Learning. Sustainability, 15(10), 7875. https://doi.org/10.3390/su15107875

Morais, F., & Ferreira, J. J. (2020). SME internationalisation process: Key issues and contributions, existing gaps and the future research agenda. European Management Journal, 38(1), 62–77. https://doi.org/10.1016/j.emj.2019.08.001

Muduli, A., & Choudhury, A. (2024). Exploring the role of workforce agility on digital transformation: a systematic literature review. Benchmarking: An International Journal, (ahead-of-print). https://doi.org/10.1108/BIJ-02-2023-0108

© COPYRIGHT UPM

Muniroh, M., Hamidah, H., & Abdullah, T. (2022a). Managerial implications on the relation of digital leadership, digital culture, organisational learning, and innovation of the employee performance (case study of pt. Telkom digital and next business department). Management and Entrepreneurship: Trends of Development, 1(19), 58–75. https://doi.org/10.26661/2522-1566/2022-1/19-05

Murtza, M. H., & Rasheed, M. I. (2023). The dark side of competitive psychological climate: Exploring the role of workplace envy. Journal of Hospitality and Tourism Insights, 6(3), 1400–1418. https://doi.org/10.1108/JHTI-03-2022-0097

Naderifar, M., Goli, H., & Ghaljaie, F. (2017a). Snowball Sampling: A Purposeful Method of Sampling in Qualitative Research. Strides in Development of Medical Education, 14(3). https://doi.org/10.5812/sdme.67670

Nagel, L. (2020). The influence of the COVID-19 pandemic on the digital transformation of work. International Journal of Sociology and Social Policy, 40(9/10), 861–875. https://doi.org/10.1108/IJSSP-07-2020-0323

Najmi, K., Kadir, A. R., & Kadir, Muh. I. A. (2018). Mediation effect of dynamic capability in the relationship between knowledge management and strategic leadership on organisational performance accountability. International Journal of Law and Management, 60(2), 517–529. https://doi.org/10.1108/IJLMA-01-2017-0004

Nambisan, S. (2017). Digital Entrepreneurship: Toward a Digital Technology Perspective of Entrepreneurship. Entrepreneurship Theory and Practice, 41(6), 1029–1055. https://doi.org/10.1111/etap.12254

Narayanamurthy, G., & Tortorella, G. (2021). Impact of COVID-19 outbreak on employee performance – Moderating role of industry 4.0 base technologies. International Journal of Production Economics, 234, 108075. https://doi.org/10.1016/j.ijpe.2021.108075

Nasiri, M., Ukko, J., Saunila, M., Rantala, T., & Rantanen, H. (2020a). Digital-related capabilities and financial performance: The mediating effect of performance measurement systems. Technology Analysis & Strategic Management, 32(12), 1393–1406. https://doi.org/10.1080/09537325.2020.1772966

Nedzinskas, Š., Pundzienė, A., Buožiūtė-Rafanavičienė, S., & Pilkienė, M. (2013). The impact of dynamic capabilities on SME performance in a volatile environment as moderated by organisational inertia. Baltic Journal of Management, 8(4), 376–396. https://doi.org/10.1108/BJM-01-2013-0003

Nguyen, T. H. (2009). Information technology adoption in SMEs: An integrated framework. International Journal of Entrepreneurial Behaviour & Research, 15(2), 162–186. https://doi.org/10.1108/13552550910944566

Nguyen, N. D, & Tran, B. V. (2021). Impacts of Organisational Factors on Work Motivation and Job Performance: Evidence from SMEs in Vietnam. The

© COPYRIGHT UPM

Journal of Asian Finance, Economics and Business, 8(10), 285–295. https://doi.org/10.13106/JAFEB.2021.VOL8.NO10.0285

Nicolás-Agustín, Á., Jiménez-Jiménez, D., & Maeso-Fernandez, F. (2022). The role of human resource practices in the implementation of digital transformation. International Journal of Manpower, 43(2), 395–410. https://doi.org/10.1108/IJM-03-2021-0176

Niemelä-Nyrhinen, J., & Leskinen, E. (2014). Multicollinearity in marketing models: Notes on the application of ridge trace estimation in structural equation modelling. Electronic Journal of Business Research Methods, 12(1), pp3-15.

Norouzi, A., Shahpouri, S., Gordon, D., Winkler, A., Nuss, E., Abel, D., Andert, J., Shahbakhti, M., & Koch, C. R. (2022). Deep learning based model predictive control for compression ignition engines. Control Engineering Practice, 127, 105299. https://doi.org/10.1016/j.conengprac.2022.105299

Nunnally, J. C. (1978). An Overview of Psychological Measurement. In B. B. Wolman (Ed.), Clinical Diagnosis of Mental Disorders (pp. 97–146). Springer US. https://doi.org/10.1007/978-1-4684-2490-4_4

Nuseir, M. T., & Aljumah, A. (2020). The Role of Digital Marketing in Business Performance with the Moderating Effect of Environment Factors among SMEs of UAE. International Journal of Innovation, 11(3). https://doi.org/10.26533/jmd.v1i2.175

Nyathi, M., & Kekwaletswe, R. (2023). Realizing employee and organisational performance gains through electronic human resource management use in developing countries. African Journal of Economic and Management Studies, 14(1), 121–134. https://doi.org/10.1108/AJEMS-11-2021-0489

Oberer, B., & Erkollar, A. (2018). Leadership 4.0: Digital Leaders in the Age of Industry 4.0. International Journal of Organisational Leadership, 7(4), 404–412. https://doi.org/10.33844/ijol.2018.60332

Ochoa Pacheco, P., & Coello-Montecel, D. (2023). Does psychological empowerment mediate the relationship between digital competencies and job performance? Computers in Human Behaviour, 140, 107575. https://doi.org/10.1016/j.chb.2022.107575

OECD. (2022). OECD SME and Entrepreneurship Outlook 2022. OECD. https://doi.org/10.1787/34907e9c-en

O'Kane, P., Smith, A., & Lerman, M. P. (2021). Building Transparency and Trustworthiness in Inductive Research Through Computer-Aided Qualitative Data Analysis Software. Organisational Research Methods, 24(1), 104–139. https://doi.org/10.1177/1094428119865016

Omowole, B. M., Olufemi-Philips, A. Q., Ofadile, O. C., Eyo-Udo, N. L., & Ewim, S. E. (2024). Barriers and drivers of digital transformation in SMEs: A conceptual

© COPYRIGHT UPM

analysis. International Journal of Frontline Research in Multidisciplinary Studies, 5(2), 019-036.https://doi.org/10.56781/ijsrst.2024.5.2.0037

Öngel,V., Günsel, A., Gençer Çelik, G., Altındağ, E., & Tatlı, H. S. (2023). Digital Leadership's Influence on Individual Creativity and Employee Performance: A View through the Generational Lens. Behavioural Sciences, 14(1), 3. https://doi.org/10.3390/bs14010003

Osborne, J. W., & Overbay, A. (n.d.). The power of outliers (and why researchers should ALWAYS check for them). https://doi.org/10.7275/QF69-7K43

Padulo, J., Bragazzi, N. L., De Giorgio, A., Grgantov, Z., Prato, S., & Ardigò, L. P. (2019). The Effect of Physical Activity on Cognitive Performance in an Italian Elementary School: Insights From a Pilot Study Using Structural Equation Modeling. Frontiers in Physiology, 10, 202. https://doi.org/10.3389/fphys.2019.00202

Paré, G., & Tremblay, M. (2007). The Influence of High-Involvement Human Resources Practices, Procedural Justice, Organisational Commitment, and Citizenship Behaviours on Information Technology Professionals' Turnover Intentions. Group & Organisation Management, 32(3), 326–357. https://doi.org/10.1177/1059601106286875

Park, S. W., Cornforth, D. M., Dushoff, J., & Weitz, J. S. (2020). The time scale of asymptomatic transmission affects estimates of epidemic potential in the COVID-19 outbreak. Epidemics, 31, 100392. https://doi.org/10.1016/j.epidem.2020.100392

Park, Y. S., Konge, L., & Artino, A. R. (2020a). The Positivism Paradigm of Research. Academic Medicine, 95(5), 690–694. https://doi.org/10.1097/ACM.0000000000003093

Parker, S. K., & Grote, G. (2022). Automation, Algorithms, and Beyond: Why Work Design Matters More Than Ever in a Digital World. Applied Psychology, 71(4), 1171–1204. https://doi.org/10.1111/apps.12241

Patten, M. L. (2017). Questionnaire research: A practical guide (Fourth edition). Routledge.https://www.abebooks.com/9781884585326

Patton, D. U., Hong, J. S., Patel, S., & Kral, M. J. (2017). A Systematic Review of Research Strategies Used in Qualitative Studies on School Bullying and Victimization. Trauma, Violence, & Abuse, 18(1), 3–16. https://doi.org/10.1177/1524838015588502

Pelletier, C., & Cloutier, L. M. (2019). Conceptualising digital transformation in SMEs: An ecosystemic perspective. Journal of Small Business and Enterprise Development, 26(6/7), 855–876. https://doi.org/10.1108/JSBED-05-2019-0144

© COPYRIGHT UPM

Peng, B. (2022a). Digital leadership: State governance in the era of digital technology. Cultures of Science, 5(4), 210–225. https://doi.org/10.1177/2096608321989835

Peng, Y., & Tao, C. (2022). Can digital transformation promote enterprise performance? —From the perspective of public policy and innovation. Journal of Innovation & Knowledge, 7(3), 100198. https://doi.org/10.1016/j.jik.2022.100198

Peredy, Z., & Feierzhati, F. (2023). Cloud Computing Solutions for Speeding-up the Small-and Medium Sized Enterprise (SME's) Businesses in China. Acta Periodica, 27, 14–33. https://doi.org/10.47273/AP.2023.1.14-33

Peter, M. K., Kraft, C., & Lindeque, J. (2020a). Strategic action fields of digital transformation: An exploration of the strategic action fields of Swiss SMEs and large enterprises. Journal of Strategy and Management, 13(1), 160–180. https://doi.org/10.1108/JSMA-05-2019-0070

Phan, X. T., Ngo, H. N., Nguyen, T. L., Pham, D. T., Truong, N. C., Pham, N. A., & Do, T. K. T. (2022). The effects of dynamic employee capabilities, fintech and innovative work behaviour on employee and supply chain performance: Evidence from Vietnamese financial industry. Uncertain Supply Chain Management, 10(4), 1305–1314. https://doi.org/10.5267/j.uscm.2022.7.009

Philbin, S., Viswanathan, R., & Telukdarie, A. (2022). Understanding how digital transformation can enable SMEs to achieve sustainable development: A systematic literature review. Small Business International Review, 6(1), e473. https://doi.org/10.26784/sbir.v6i1.473

Philippart, M. H. (2022). Success Factors to Deliver Organisational Digital Transformation: A Framework for Transformation Leadership. Journal of Global Information Management, 30(8), 1–17. https://doi.org/10.4018/JGIM.304068

Phonthanukitithaworn, C., Srisathan, W. A., Ketkaew, C., & Naruetharadhol, P. (2023). Sustainable Development towards Openness SME Innovation: Taking Advantage of Intellectual Capital, Sustainable Initiatives, and Open Innovation. Sustainability, 15(3), 2126. https://doi.org/10.3390/su15032126

Ping, R. A. (1995). A parsimonious estimating technique for interaction and quadratic latent variables. Journal of marketing research, 32(3), 336-347.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioural research: A critical review of the literature and recommended remedies. Journal of Applied Psychology, 88(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Pollok, P., Lüttgens, D., & Piller, F. T. (2019). How Firms Develop Capabilities for Crowdsourcing to Increase Open Innovation Performance: The Interplay between Organisational Roles and Knowledge Processes. Journal of Product Innovation Management, 36(4), 412–441. https://doi.org/10.1111/jpim.12485

© COPYRIGHT UPM

Porfírio, J. A., Carrilho, T., Felício, J. A., & Jardim, J. (2021). Leadership characteristics and digital transformation. Journal of Business Research, 124, 610–619. https://doi.org/10.1016/j.jbusres.2020.10.058

Porter, M. E. (1991). Towards a dynamic theory of strategy. Strategic Management Journal, 12(S2), 95–117. https://doi.org/10.1002/smj.4250121008

PRABOWO, H., SRIWIDADI, T., & IKHSAN, R. B. (2021). The Influence of Dynamic Capability on Sustainable Competitive Advantage: An Empirical Study of Small Businesses in Indonesia. The Journal of Asian Finance, Economics and Business, 8(6), 949–959. https://doi.org/10.13106/JAFEB.2021.VOL8.NO6.0949

Prange, C., & Zhao, Y. (2018). Chapter 12: Strategies for Internationalisation: How Chinese SMEs Deal with Distance and Market Entry Speed. In N. Dominguez & U. Mayrhofer (Eds.), International Business and Management (Vol. 34, pp. 205–224). Emerald Publishing Limited. https://doi.org/10.1108/S1876-066X20180000034012

Pratono, A. H., Darmasetiawan, N. K., Yudiarso, A., & Jeong, B. G. (2019). Achieving sustainable competitive advantage through green entrepreneurial orientation and market orientation: The role of inter-organisational learning. The Bottom Line, 32(1), 2–15. https://doi.org/10.1108/BL-10-2018-0045

Priyono, A., & Hidayat, A. (2024). Fostering innovation through learning from digital business ecosystem: A dynamic capability perspective. Journal of Open Innovation: Technology, Market, and Complexity, 10(1), 100196. https://doi.org/10.1016/j.joitmc.2023.100196

Proksch, D., Rosin, A. F., Stubner, S., & Pinkwart, A. (2021). The influence of a digital strategy on the digitalisation of new ventures: The mediating effect of digital capabilities and a digital culture. Journal of Small Business Management, 1–29. https://doi.org/10.1080/00472778.2021.1883036

Promsri, D. C. (2019). Developing Model of Digital Leadership for a Successful Digital Transformation. 02(08). https://doi.org/10.31933/dijdbm.v5i2.2230

Pulsiri, N., & Vatananan-Thesenvitz, R. (2018). A Systematic Literature Review of Dynamic Capabilities, Strategic Foresight and Organisational Learning. 2018 Portland International Conference on Management of Engineering and Technology (PICMET), 1–9. https://doi.org/10.23919/PICMET.2018.8481885

Purwanto, M. B., Hartono, R., & Wahyuni, S. (2023). Essential Skills Challenges for the 21st Century Graduates: Creating A Generation of High-Level Competence in The Industrial Revolution 4.0 Era. Asian Journal of Applied Education (AJAE), 2(3), 279–292. https://doi.org/10.55927/ajae.v2i3.3972

Putra, R. E., Neswardi, S., Primadona, P., Jumyetti, J., & Yuanita, I. (2023). Impact Of Digital Leadership on Small Medium Enterprises Resilience: The Mediating Role of Employee Creativity. AMAR (Andalas Management Review), 7(1), 35–61. https://doi.org/10.25077/amar.7.1.35-61.2023

© COPYRIGHT UPM

Putra, R., & Ruslan, S. (2021). INFLUENCE WORK DISCIPLINE, ORGANISATIONAL LEARNING, AND MOTIVATION TO EMPLOYEE PERFORMANCE AT PT CIMB NIAGA TBK. Dinasti International Journal of Digital Business Management, 2(2), 324–334. https://doi.org/10.31933/dijdbm.v2i2.775

Putriastuti, B. C. K., & Stasi, A. (2019). HOW TO LEAD THE MILLENNIALS: A REVIEW OF 5 MAJOR LEADERSHIP THEORY GROUPS. Journal of Leadership in Organisations, 1(2). https://doi.org/10.22146/jlo.46562

Qiao, G., Li, Y., & Hong, A. (2024). The strategic role of digital transformation: Leveraging digital leadership to enhance employee performance and organizational commitment in the digital era. Systems, 12(11), 457. https://doi.org/10.3390/systems12110457

Quansah, E., Hartz, D. E., & Salipante, P. (2022). Adaptive practices in SMEs: Leveraging dynamic capabilities for strategic adaptation. Journal of Small Business and Enterprise Development, 29(7), 1130–1148. https://doi.org/10.1108/JSBED-07-2021-0269

Quratulain, S., Ejaz, A., & Khan, A. K. (2021). Do self-monitors experience less emotional exhaustion? Testing the role of supervisor-rated performance and perceived competitive climate. Journal of Service Theory and Practice, 31(5), 738–755. https://doi.org/10.1108/JSTP-12-2020-0305

Rahi, S. (2017). Research Design and Methods: A Systematic Review of Research Paradigms, Sampling Issues and Instruments Development. International Journal of Economics & Management Sciences, 06(02). https://doi.org/10.4172/2162-6359.1000403

Rao, P., Kumar, S., Chavan, M., & Lim, W. M. (2023). A systematic literature review on SME financing: Trends and future directions. Journal of Small Business Management, 61(3), 1247-1277. https://doi.org/10.1080/00472778.2021.1955123

Rahman,M. M. (2023). Sample size determination for survey research and non-probability sampling techniques: A review and set of recommendations. Journal of Entrepreneurship, Business and Economics, 11(1), 42-62. https://doi.org/10.5465/AMR.2007.26586092

Ramadani, V., Abazi-Alili, H., Dana, L.-P., Rexhepi, G., & Ibraimi, S. (2017). The impact of knowledge spillovers and innovation on firm-performance: Findings from the Balkans countries. International Entrepreneurship and Management Journal, 13(1), 299–325. https://doi.org/10.1007/s11365-016-0393-8

Ramdani, B., Raja, S., & Kayumova, M. (2022). Digital innovation in SMEs: A systematic review, synthesis and research agenda. Information Technology for Development, 28(1), 56–80. https://doi.org/10.1080/02681102.2021.1893148

Raoprasert, T., & Islam, S. M. N. (2010). Designing an Efficient Management System. Physica-Verlag HD. https://doi.org/10.1007/978-3-7908-2372-1

© COPYRIGHT UPM

Rashid, A., Rasheed, R., & Ngah, A. H. (2024). Achieving sustainability through multifaceted green functions in manufacturing. Journal of Global Operations and Strategic Sourcing. https://doi.org/10.1108/JGOSS-06-2023-0054

Rehman, A. A., & Alharthi, K. (2016). An introduction to research paradigms. International journal of educational investigations, 3(8), 51-59. https://doi.org/10.4236/ce.2016.149118

Reis, J., & Melão, N. (2023). Digital transformation: A meta-review and guidelines for future research. Heliyon, 9(1), e12834. https://doi.org/10.1016/j.heliyon.2023.e12834

Ren, X., & Sun, X. (2023). How do enterprise social media affordances affect knowledge sharing within project teams: The social cognitive theory view. Information Technology & People. https://doi.org/10.1108/ITP-12-2022-0990

Renkema, M., Leede, J., & Van Zyl, L. E. (2021a). High-involvement HRM and innovative behaviour: The mediating roles of nursing staff's autonomy and affective commitment. Journal of Nursing Management, 29(8), 2499–2514. https://doi.org/10.1111/jonm.13390

Revuelto-Taboada, L., Canet-Giner, M. T., & Balbastre-Benavent, F. (2021). High-Commitment Work Practices and the Social Responsibility Issue: Interaction and Benefits. Sustainability, 13(2), 459. https://doi.org/10.3390/su13020459

Riski, A., & Rino, R. (2024). The The Effect of Digital Leadership Style, Motivation, and Work Ability on Employee Performance After the Covid-19 Pandemic. Edunesia: Jurnal Ilmiah Pendidikan, 5(1), 424-441. https://doi.org/10.51276/edu.v5i1.647

Ristyawan, M. R., Putro, U. S., & Siallagan, M. (2023). Decision making mechanism in resource based theory: A literature review, synthesis, and future research. Cogent Business & Management, 10(2), 2247217. https://doi.org/10.1080/23311975.2023.2247217

Rodrigues, M., Franco, M., Silva, R., & Oliveira, C. (2021a). Success Factors of SMEs: Empirical Study Guided by Dynamic Capabilities and Resources-Based View. Sustainability, 13(21), 12301. https://doi.org/10.3390/su132112301

Rodríguez-Serrano, M. Á., & Martín-Armario, E. (2019a). Born-Global SMEs, Performance, and Dynamic Absorptive Capacity: Evidence from Spanish Firms. Journal of Small Business Management, 57(2), 298–326. https://doi.org/10.1111/jsbm.12319

Rosmi, R., & Syamsir, S. (2021). The Effect of Integrity and Professionalism on Employee Performance in Digital Era. Proceedings of the 1st Tidar International Conference on Advancing Local Wisdom Towards Global Megatrends, TIC 2020, 21-22 October 2020, Magelang, Jawa Tengah, Indonesia. Proceedings of the 1st Tidar International Conference on Advancing Local Wisdom Towards Global Megatrends, TIC 2020, 21-22 October 2020,

Magelang, Jawa Tengah, Indonesia, Magelang, Indonesia. https://doi.org/10.4108/eai.21-10-2020.2311846

Rubel, M. R. B., Kee, D. M. H., & Rimi, N. N. (2020). Matching People with Technology: Effect of HIWP on Technology Adaptation. South Asian Journal of Human Resources Management, 7(1), 9–33. https://doi.org/10.1177/2322093719875567

Rubel, M. R. B., Kee, D. M. H., & Rimi, N. N. (2023a). Promoting technology innovation performance through high involvement HRM, technology adaptation and innovativeness. Business Process Management Journal, 29(5), 1277–1302. https://doi.org/10.1108/BPMJ-10-2022-0526

Rubel, M. R. B., Kee, D. M. H., Rimi, N. N., & Yusoff, Y. M. (2017a). Adapting technology: Effect of high-involvement HRM and organisational trust. Behaviour & Information Technology, 36(3), 281–293. https://doi.org/10.1080/0144929X.2016.1222552

Rubel, M. R. B., Rimi, N. N., Yusliza, M.-Y., & Kee, D. M. H. (2018). High commitment human resource management practices and employee service behaviour: Trust in management as mediator. IIMB Management Review, 30(4), 316–329. https://doi.org/10.1016/j.iimb.2018.05.006

Rubera, G., & Kirca, A. H. (2012). Firm Innovativeness and Its Performance Outcomes: A Meta-Analytic Review and Theoretical Integration. Journal of Marketing, 76(3), 130–147. https://doi.org/10.1509/jm.10.0494

Ruoslahti, H., & Trent, A. (2020). Organisational Learning in the Academic Literature – Systematic Literature Review. Information & Security: An International Journal, 46(1), 65–78. https://doi.org/10.11610/isij.4605

Rupčić, N. (2018). Intergenerational learning and knowledge transfer – challenges and opportunities. The Learning Organisation, 25(2), 135–142. https://doi.org/10.1108/TLO-11-2017-0117

Rupeika-Apoga, R., Bule, L., & Petrovska, K. (2022). Digital Transformation of Small and Medium Enterprises: Aspects of Public Support. Journal of Risk and Financial Management, 15(2), 45. https://doi.org/10.3390/jrfm15020045

Rupeika-Apoga, R., Petrovska, K., & Bule, L. (2022). The Effect of Digital Orientation and Digital Capability on Digital Transformation of SMEs during the COVID-19 Pandemic. Journal of Theoretical and Applied Electronic Commerce Research, 17(2), 669–685. https://doi.org/10.3390/jtaer17020035

Russell, M. (2017). Management incentives to recognise intangible assets. Accounting & Finance, 57(S1), 211–234. https://doi.org/10.1111/acfi.12154

Russell, Z. A., Steffensen, D. S., Ellen, B. P., Zhang, L., Bishoff, J. D., & Ferris, G. R. (2018). High performance work practice implementation and employee impressions of line manager leadership. Human Resource Management Review, 28(3), 258–270. https://doi.org/10.1016/j.hrmr.2018.02.003

© COPYRIGHT UPM

Sadiku-Dushi, N., Dana, L.-P., & Ramadani, V. (2019). Entrepreneurial marketing dimensions and SMEs performance. Journal of Business Research, 100, 86–99. https://doi.org/10.1016/j.jbusres.2019.03.025

Saeedikiya, M., Salunke, S., & Kowalkiewicz, M. (2024). Toward a dynamic capability perspective of digital transformation in SMEs: A study of the mobility sector. Journal of Cleaner Production, 439, 140718. https://doi.org/10.1016/j.jclepro.2024.140718

Sai, S., Gaur, A., Sai, R., Chamola, V., Guizani, M., & Rodrigues, J. J. (2024). Generative ai for transformative healthcare: A comprehensive study of emerging models, applications, case studies and limitations. IEEE Access. https://doi.org/10.1109/ACCESS.2024.3367715

Saldanha, T. J. V., Kathuria, A., Khuntia, J., Konsynski, B., & Rojas, M. A. (2017). Leveraging Digitalisation of Services for Performance: Evidence from the Credit Union Industry. https://doi.org/10.1287/isre.2021.1006

Salvato, C., & Vassolo, R. (2018). The sources of dynamism in dynamic capabilities. Strategic Management Journal, 39(6), 1728–1752. https://doi.org/10.1002/smj.2703

Samimi, M., Cortes, A. F., Anderson, M. H., & Herrmann, P. (2022). What is strategic leadership? Developing a framework for future research. The Leadership Quarterly, 33(3), 101353. https://doi.org/10.1016/j.leaqua.2019.101353

Samsami, F., Khodadad Hosseini, S. H., Kordnaeij, A., & Azar, A. (2015). Managing Environmental Uncertainty: From Conceptual Review to Strategic Management Point of View. International Journal of Business and Management, 10(7), p215. https://doi.org/10.5539/ijbm.v10n7p215

Samsudin, Z. B., & Ismail, M. D. (2019). The Concept of Theory of Dynamic Capabilities in Changing Environment. International Journal of Academic Research in Business and Social Sciences, 9(6), Pages 1071-1078. https://doi.org/10.6007/IJARBSS/v9-i6/6068

Sandberg, E., & Åman, P. (2010). Logistics learning mechanisms and capabilities: Towards an understanding of sustainable competitive advantage. Logistics Research, 2(2), 97–108. https://doi.org/10.1007/s12159-010-0029-2

Santoro, G., Thrassou, A., Bresciani, S., & Giudice, M. D. (2021). Do Knowledge Management and Dynamic Capabilities Affect Ambidextrous Entrepreneurial Intensity and Firms' Performance? IEEE Transactions on Engineering Management, 68(2), 378–386. https://doi.org/10.1109/TEM.2019.2907874

Santoso, P. B., Purwanto, A., Siswanto, E., Setiana, Y. N., Sudargini, Y., & Fahmi, K. (2020). Effect of Hard Skills, Soft Skills, Organisational Learning and Innovation Capability on Islamic University Lecturers' Performance. 02(01). https://doi.org/10.31838/srp.2020.7.80

© COPYRIGHT UPM

Saputra, N., Sasanti, N., Alamsjah, F., & Sadeli, F. (2022). Strategic role of digital capability on business agility during COVID-19 era. Procedia Computer Science, 197, 326–335. https://doi.org/10.1016/j.procs.2021.12.147

Saputra, M. H., Utomo, M. N., Ariansyah, K., Wismayanti, Y. F., & Ansyah, R. H. A. (2024). Small and medium-sized enterprises dynamic capabilities and competitive advantage: The mediating effect of digitalization. Entrepreneurial Business and Economics Review, 12(3), 41-67. https://doi.org/10.15678/EBER.2024.120303

Sarstedt, M., Bengart, P., Shaltoni, A. M., & Lehmann, S. (2018). The use of sampling methods in advertising research: A gap between theory and practice. International Journal of Advertising, 37(4), 650–663. https://doi.org/10.1080/02650487.2017.1348329

Sart, G., & Yildiz, O. (2022). Digitalism and Jobs of the Future: In O. Yildiz (Ed.), Advances in Business Strategy and Competitive Advantage (pp. 1–20). IGI Global. https://doi.org/10.4018/978-1-7998-8169-8.ch001

Sarstedt, M., Ringle, C. M., & Hair, J. F. (2021). Partial least squares structural equation modeling. In Handbook of market research (pp. 587-632). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-05542-8_15-2

Sasmoko, S., Mihardjo, L. W. W., Alamsjah, F., & Elidjen, E. (2019). Dynamic capability: The effect of digital leadership on fostering innovation capability based on market orientation. Management Science Letters, 1633–1644. https://doi.org/10.5267/j.msl.2019.5.024

Sattar, T., Ahmad, K., & Hassan, S. M. (2015). Role of human resource practices in employee performance and job satisfaction with mediating effect of employee engagement. Pakistan Economic and Social Review, 81-96. https://www.jstor.org/stable/26153249

Saunders, M. N., Lewis, P., & Thornhill, A. (2019). Research methods for business students (Eighth). Harlow: Pearson Education Limited. https://lccn.loc.gov/2022042533

Scheuer, L. J., & Thaler, J. (2022). HOW do dynamic capabilities affect performance? A systematic review of mediators. European Management Journal, S0263237322001724. https://doi.org/10.1016/j.emj.2022.12.006

Schilke, O., Hu, S., & Helfat, C. E. (2018). Quo Vadis, Dynamic Capabilities? A Content-Analytic Review of the Current State of Knowledge and Recommendations for Future Research. Academy of Management Annals, 12(1), 390–439. https://doi.org/10.5465/annals.2016.0014

Schoemaker, P. J. H., Heaton, S., & Teece, D. (2018). Innovation, Dynamic Capabilities, and Leadership. California Management Review, 61(1), 15–42. https://doi.org/10.1177/0008125618790246

© COPYRIGHT UPM

Schrag,F. (1992). In defense of positivist research paradigms. Educational researcher, 21(5), 5-8. https://doi.org/10.3102/0013189X021005005

Schrock, W. A., Hughes, D. E., Fu, F. Q., Richards, K. A., & Jones, E. (2016). Better together: Trait competitiveness and competitive psychological climate as antecedents of salesperson organisational commitment and sales performance. Marketing Letters, 27(2), 351–360. https://doi.org/10.1007/s11002-014-9329-7

Schwarzmüller, T., Brosi, P., Duman, D., & Welpe, I. M. (2018). How Does the Digital Transformation Affect Organisations? Key Themes of Change in Work Design and Leadership. Management Revu, 29(2), 114–138. https://doi.org/10.5771/0935-9915-2018-2-114

Scuotto, V., Nicotra, M., Del Giudice, M., Krueger, N., & Gregori, G. L. (2021). A microfoundational perspective on SMEs' growth in the digital transformation era. Journal of Business Research, 129, 382–392. https://doi.org/10.1016/j.jbusres.2021.01.045

Seddon, P. B. (2014). Implications for strategic IS research of the resource-based theory of the firm: A reflection. The Journal of Strategic Information Systems, 23(4), 257-269.https://doi.org/10.1016/j.jsis.2014.11.001

Sekaran, U., & Bougie, R. (2013). Research methods for business: A skill-building approach (6th ed). Wiley. https://doi.org/10.12691/jbms-12-2-1

Sekhar, C., Patwardhan, M., & Vyas, V. (2015). A Delphi-AHP-TOPSIS Based Framework for the Prioritization of Intellectual Capital Indicators: A SMEs Perspective. Procedia - Social and Behavioural Sciences, 189, 275–284. https://doi.org/10.1016/j.sbspro.2015.03.223

Shao, Z., Li, X., Luo, Y., & Benitez, J. (2022). The differential impacts of top management support and transformational supervisory leadership on employees' digital performance. European Journal of Information Systems, 1–27. https://doi.org/10.1080/0960085X.2022.2147456

Shek, D. T. L., & Yu, L. (2014). Confirmatory factor analysis using AMOS: A demonstration. International Journal on Disability and Human Development, 13(2). https://doi.org/10.1515/ijdhd-2014-0305

Shet, S. V. (2024). A VUCA-ready workforce: exploring employee competencies and learning and development implications. Personnel Review, 53(3), 674-703. https://doi.org/10.1108/PR-10-2023-0873

Shen, L., Zhang, X., & Liu, H. (2022). Digital technology adoption, digital dynamic capability, and digital transformation performance of textile industry: Moderating role of digital innovation orientation. Managerial and Decision Economics, 43(6), 2038–2054. https://doi.org/10.1002/mde.3507

Shin, J., Mollah, M. A., & Choi, J. (2023). Sustainability and Organisational Performance in South Korea: The Effect of Digital Leadership on Digital

© COPYRIGHT UPM

Culture and Employees' Digital Capabilities. Sustainability, 15(3), 2027. https://doi.org/10.3390/su15032027

Shin, S. J., Jeong, I., & Bae, J. (2018). Do high-involvement HRM practices matter for worker creativity? A cross-level approach. The International Journal of Human Resource Management, 29(2), 260–285. https://doi.org/10.1080/09585192.2015.1137612

Shore, A., Tiwari, M., Tandon, P., & Foropon, C. (2024). Building entrepreneurial resilience during crisis using generative AI: An empirical study on SMEs. *Technovation*, *135*, 103063. https://doi.org/10.1016/j.technovation.2024.103063

Shwedeh, F., Aburayya, A., & Mansour, M. (n.d.). The Impact of Organisational Digital Transformation on Employee Performance: A Study in the UAE. https://doi.org/10.33084/restorica.v6i1.1251

Silva, G. M., Gomes, P. J., Carvalho, H., & Geraldes, V. (2021). Sustainable development in small and medium enterprises: The role of entrepreneurial orientation in supply chain management. Business Strategy and the Environment, 30(8), 3804–3820. https://doi.org/10.1002/bse.2841

Sima, V., Gheorghe, I. G., Subić, J., & Nancu, D. (2020). Influences of the Industry 4.0 Revolution on the Human Capital Development and Consumer Behaviour: A Systematic Review. Sustainability, 12(10), 4035. https://doi.org/10.3390/su12104035

Simbolon, S., Susanto, A., & Ilham, R. N. (2023). Analysis of the effect of human resource planning, quality of work life and compensation on employee work performance at PT. Supermarkets Maju Bersama Medan. International journal of artificial intelligence research, 6(1.1), 2022. https://doi.org/10.29099/ijair.v6i1.1.514

Siraj, N., Hágen, I., Cahyadi, A., Tangl, A., & Desalegn, G. (2022). Linking Leadership to Employees Performance: The Mediating Role of Human Resource Management. Economies, 10(5), 111. https://doi.org/10.3390/economies10050111

Snihur, Y., & Wiklund, J. (2019). Searching for innovation: Product, process, and business model innovations and search behaviour in established firms. Long Range Planning, 52(3), 305–325. https://doi.org/10.1016/j.lrp.2018.05.003

Song, M., Tao, W., & Shen, Z. (2022). The impact of digitalisation on labor productivity evolution: Evidence from China. Journal of Hospitality and Tourism Technology. https://doi.org/10.1108/JHTT-03-2022-0075

Sousa, M. J., & Rocha, Á. (2019). Digital learning: Developing skills for digital transformation of organisations. Future Generation Computer Systems, 91, 327–334. https://doi.org/10.1016/j.future.2018.08.048

© COPYRIGHT UPM

Sow, M., & Aborbie, S. (2018a). Impact of Leadership on Digital Transformation. Business and Economic Research, 8(3), 139. https://doi.org/10.5296/ber.v8i3.13368

Spanó, E., Monnerat, R., Pacheco, C. A., & Bonacelli, M. B. M. (2024). Legal–institutional design and dynamic capabilities for mission-oriented innovation agencies: a new framework. Science and Public Policy, 51(2), 192-206. https://doi.org/10.1093/scipol/scad060

Spurk, D., Keller, A. C., & Hirschi, A. (2019). Competition in career tournaments: Investigating the joint impact of trait competitiveness and competitive psychological climate on objective and subjective career success. Journal of Occupational and Organisational Psychology, 92(1), 74–97. https://doi.org/10.1111/joop.12238

Stana, R. A., Fischer, L. H., & Nicolajsen, H. W. (2024). Review for future research in digital leadership. arXiv preprint arXiv:2409.01056.

Stantcheva, S. (2023). How to run surveys: A guide to creating your own identifying variation and revealing the invisible. Annual Review of Economics, 15(1), 205-234. https://doi.org/10.1146/annurev-economics-091622-010157

Stirpe, L., Profili, S., & Sammarra, A. (2022). Satisfaction with HR practices and employee performance: A moderated mediation model of engagement and health. European Management Journal, 40(2), 295–305. https://doi.org/10.1016/j.emj.2021.06.003

Strietska-Ilina, O., & Chun, H.-K. (2021). Changing demand for skills in digital economies and societies: Literature review and case studies from low- and middle-income countries ([1st ed.]). ILO.

Su, J., Zhang, Y., & Wu, X. (2023). How market pressures and organisational readiness drive digital marketing adoption strategies' evolution in small and medium enterprises. Technological Forecasting and Social Change, 193, 122655. https://doi.org/10.1016/j.techfore.2023.122655

Su, X., Wang, S., & Li, F. (2023). The Impact of Digital Transformation on ESG Performance Based on the Mediating Effect of Dynamic Capabilities. Sustainability, 15(18), 13506. https://doi.org/10.3390/su151813506

Sullivan, J. H., Warkentin, M., & Wallace, L. (2021). So many ways for assessing outliers: What really works and does it matter? Journal of Business Research, 132, 530–543. https://doi.org/10.1016/j.jbusres.2021.03.066

Sun, X., Lv, K., Wang, F., Ge, P., Niu, Y., Yu, W., ... & Wu, Y. (2023). Validity and reliability of the Chinese version of the Health Literacy Scale Short-Form in the Chinese population. BMC Public Health, 23(1), 385. https://doi.org/10.1186/s12889-023-15237-2

Sun, Y., & Jung, H. (2024). Machine Learning (ML) Modeling, IoT, and Optimizing Organizational Operations through Integrated Strategies: The Role of

© COPYRIGHT UPM

Technology and Human Resource Management. Sustainability, 16(16), 6751. https://doi.org/10.3390/su16166751

Sutrisno, S., Ausat, A. M. A., Permana, B., & Harahap, M. A. K. (2023). Do Information Technology and Human Resources Create Business Performance: A Review. *International Journal of Professional Business Review: Int. J. Prof. Bus. Rev.*, *8*(8), 14. https://doi.org/10.26668/businessreview/2023.v8i8.2206

Swab, R. G., & Johnson, P. D. (2019). Steel sharpens steel: A review of multilevel competition and competitiveness in organisations. Journal of Organisational Behaviour, 40(2), 147–165. https://doi.org/10.1002/job.2340

Bockshecker, A., Hackstein, S., & Baumöl, U. (2018). Systematization of the term digital transformation and its phenomena from a socio-technical perspective–A literature review. https://aisel.aisnet.org/ecis2018_rp/43 https://10.13140/rg.2.2.27251.09767

Taherdoost, H. (2022). What are Different Research Approaches? Comprehensive Review of Qualitative, Quantitative, and Mixed Method Research, Their Applications, Types, and Limitations. Journal of Management Science & Engineering Research, 5(1), 53–63. https://doi.org/10.30564/jmser.v5i1.4538

Tang, L., Lu, B., & Tian, T. (2021). Spatial Correlation Network and Regional Differences for the Development of Digital Economy in China. Entropy, 23(12), 1575. https://doi.org/10.3390/e23121575

Tee, P. K., Wong, L. C., Dada, M., Song, B. L., & Ng, C. P. (2024). Demand for digital skills, skill gaps and graduate employability: Evidence from employers in Malaysia. F1000Research, 13, 389. https://doi.org/10.12688/f1000research.148514.1

Teece, D. J. (2000). Strategies for managing knowledge assets: the role of firm structure and industrial context. Long range planning, 33(1), 35-54.https://doi.org/10.1016/S0024-6301(99)00117-X

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. Strategic Management Journal, 28(13), 1319–1350. https://doi.org/10.1002/smj.640

Teece, D. J. (2010). Business Models, Business Strategy and Innovation. Long Range Planning, 43(2–3), 172–194. https://doi.org/10.1016/j.lrp.2009.07.003

Teece, D. J. (2015). Intangible Assets and a Theory of Heterogeneous Firms. In A. Bounfour & T. Miyagawa (Eds.), Intangibles, Market Failure and Innovation Performance (pp. 217–239). Springer International Publishing. https://doi.org/10.1007/978-3-319-07533-4_9

Teece, D. J. (2018). Dynamic capabilities as (workable) management systems theory. Journal of Management & Organisation, 24(3), 359–368. https://doi.org/10.1017/jmo.2017.75

© COPYRIGHT UPM

Teece, D. J., & Linden, G. (2017). Business models, value capture, and the digital enterprise. Journal of Organisation Design, 6(1), 8. https://doi.org/10.1186/s41469-017-0018-x

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. Strategic Management Journal, 18(7), 509–533. https://doi.org/10.1002/(SICI)1097-0266(199708)18:7<509::AID-SMJ882>3.0.CO;2-Z

Tejumade V. Adeniran. (2012). Investigating the dynamic capabilities and competitive advantage of South African SMEs. African Journal of Business Management, 6(11). https://doi.org/10.5897/AJBM11.1673

Teng, X., Wu, Z., & Yang, F. (2022). Research on the Relationship between Digital Transformation and Performance of SMEs. Sustainability, 14(10), 6012. https://doi.org/10.3390/su14106012

Teng, X., Wu, Z., & Yang, F. (2022). Impact of the digital transformation of small-and medium-sized listed companies on performance: based on a cost-benefit analysis framework. *Journal of Mathematics*, *2022*(1), 1504499. https://doi.org/10.1155/2022/1504499

Tepper, B. J., Dimotakis, N., Lambert, L. S., Koopman, J., Matta, F. K., Man Park, H., & Goo, W. (2018). Examining Follower Responses to Transformational Leadership from a Dynamic, Person–Environment Fit Perspective. Academy of Management Journal, 61(4), 1343–1368. https://doi.org/10.5465/amj.2014.0163

Terziovski, M. (2010). Innovation practice and its performance implications in small and medium enterprises (SMEs) in the manufacturing sector: a resource-based view. Strategic management journal, 31(8), 892-902. https://doi.org/10.1002/smj.841

Thomas, D. R. (2003). A general inductive approach for qualitative data analysis. https://doi.org/10.1177/1098214005283748

Thordsen, T., Murawski, M., & Bick, M. (2020). How to Measure Digitalisation? A Critical Evaluation of Digital Maturity Models. In M. Hattingh, M. Matthee, H. Smuts, I. Pappas, Y. K. Dwivedi, & M. Mäntymäki (Eds.), Responsible Design, Implementation and Use of Information and Communication Technology (Vol. 12066, pp. 358–369). Springer International Publishing. https://doi.org/10.1007/978-3-030-44999-5_30

Tolossa, A. T., Singh, M., & Gautam, R. K. (2024). Unveiling the Nexus: the crucial role of competitive advantage in bridging entrepreneurial marketing practices and sustainable firm performance in small and medium enterprises. Journal of Innovation and Entrepreneurship, 13(1), 43.https://doi.org/10.1186/s13731-024-00398-0

© COPYRIGHT UPM

Toney, M. B., Keller, C., & Hunter, L. M. (2003). Regional cultures, persistence and change: A case study of the Mormon Culture Region. The Social Science Journal, 40(3), 431–445. https://doi.org/10.1016/S0362-3319(03)00040-5

Toyama, K. S. (2024). J Nplots: an R package to visualize outputs from the Johnson–Neyman technique for categorical and continuous moderators, including options for phylogenetic regressions. Evolutionary Ecology, 38(3), 371-385.https:/doi.org/10.1101/2023.05.05539633

Tran Huy, P. (2023). High-performance work system and knowledge hoarding: The mediating role of competitive climate and the moderating role of high-performance work system psychological contract breach. International Journal of Manpower, 44(1), 77–94. https://doi.org/10.1108/IJM-06-2021-0331

Troise, C., Corvello, V., Ghobadian, A., & O'Regan, N. (2022). How can SMEs successfully navigate VUCA environment: The role of agility in the digital transformation era. Technological Forecasting and Social Change, 174, 121227. https://doi.org/10.1016/j.techfore.2021.121227

Tiwari, M., Bryde, D. J., Stavropoulou, F., & Malhotra, G. (2024). Understanding the evolution of flexible supply chain in the business-to-business sector: a resource-based theory perspective. International Studies of Management & Organization, 54(4), 380-406. https://doi.org/10.1080/00208825.2024.2324245

Tsang, N. K. F. (2011). Dimensions of Chinese culture values in relation to service provision in hospitality and tourism industry. International Journal of Hospitality Management, 30(3), 670–679. https://doi.org/10.1016/j.ijhm.2010.12.002

Turel, O., & Gaudioso, F. (2018). Techno-stressors, distress and strain: The roles of leadership and competitive climates. Cognition, Technology & Work, 20(2), 309–324. https://doi.org/10.1007/s10111-018-0461-7

Turyadi, I., Tawil, M. R., Ali, H., & Sadikin, A. (2023).. The role of digital leadership in organisations to improve employee performance and business success. Jurnal Ekonomi, 12(02), 1671-1677. https://doi.org/10.33019/ijomm.v1i2.23

Tworek, K., Bieńkowska, A., Hawrysz, L., & Maj, J. (2023a). The Model of Organisational Performance Based on Employees' Dynamic Capabilities–Verification During Crisis Caused by Black Swan Event. IEEE Access, 11, 45039–45055. https://doi.org/10.1109/ACCESS.2023.3273608

Urrutia Pereira, G., De Lara Machado, W., & Ziebell De Oliveira, M. (2022). Organisational learning culture in industry 4.0: Relationships with work engagement and turnover intention. Human Resource Development International, 25(5), 557–577. https://doi.org/10.1080/13678868.2021.1976020

Usai, A., Fiano, F., Messeni Petruzzelli, A., Paoloni, P., Farina Briamonte, M., & Orlando, B. (2021). Unveiling the impact of the adoption of digital technologies

© COPYRIGHT UPM

on firms' innovation performance. Journal of Business Research, 133, 327–336. https://doi.org/10.1016/j.jbusres.2021.04.035

Valliant, R. (2020). Comparing Alternatives for Estimation from Nonprobability Samples. Journal of Survey Statistics and Methodology, 8(2), 231–263. https://doi.org/10.1093/jssam/smz003

Vărzaru, A. A., & Bocean, C. G. (2024). Digital transformation and innovation: The influence of digital technologies on turnover from innovation activities and types of innovation. Systems, 12(9), 359. https://doi.org/10.3390/systems12090359

Uher, V., Dráždilová, P., Platoš, J., & Badura, P. (2022). Automation of cleaning and ensembles for outliers' detection in questionnaire data. Expert Systems with Applications, 206, 117809. https://doi.org/10.1016/j.eswa.2022.117809

Vial, G. (2019a). Understanding digital transformation: A review and a research agenda. The Journal of Strategic Information Systems, 28(2), 118–144. https://doi.org/10.1016/j.jsis.2019.01.003

Viengkham, D., Baumann, C., & Winzar, H. (2018). Confucianism: Measurement and association with workforce performance. Cross Cultural & Strategic Management, 25(2), 337–374. https://doi.org/10.1108/CCSM-06-2017-0078

Vijayakumar,H. (2021). Impact of AI-Blockchain Adoption on Annual Revenue Growth: An Empirical Analysis of Small and Medium-sized Enterprises in the United States. International Journal of Business Intelligence and Big Data Analytics, 4(1), 12-21. https://doi.org/10.35409/IJBMER.2024.3584

Unegbu, H. C., Yawas, D. S., & Dan-asabe, B. (2024). the Impact of Digital Transformation on Nigerian Small and Medium-Sized Enterprises (Smes) in the Global Business Landscape. Jurnal Mekanikal, 66-85. https://doi.org/10.11113/jm.v47.478

Vrana, J., & Singh, R. R. (2025). Digitization, digitalization, digital transformation, and beyond. In Handbook of nondestructive evaluation 4.0 (pp. 1-26). Cham: Springer Nature Switzerland. https://doi.org/10.13140/RG.2.2.17366.46409

Vrontis, D., Chaudhuri, R., & Chatterjee, S. (2022). Adoption of digital technologies by SMEs for sustainability and value creation: Moderating role of entrepreneurial orientation. Sustainability, 14(13), 7949. https://doi.org/10.3390/su14137949

Vuong, B. N., Tung, D. D., Hoa, N. D., Chau, N. T. N., & Tushar, H. (2020). An empirical assessment of organizational commitment and job performance: Vietnam small and medium-sized enterprises. The Journal of Asian Finance, Economics and Business, 7(6), 277-286.https://doi.org/10.13106/jafeb.2020.vol7.no6.277

© COPYRIGHT UPM

Vuong, T. D. N., & Nguyen, L. T. (2022). The key strategies for measuring employee performance in companies: a systematic review. Sustainability, 14(21), 14017. https://doi.org/10.3390/su142114017

W Wasono, L., & Furinto, A. (2018). The effect of digital leadership and innovation management for incumbent telecommunication company in the digital disruptive era. International Journal of Engineering & Technology, 7(2.29), 125. https://doi.org/10.14419/ijet.v7i2.29.13142

Wales, W. J., Covin, J. G., Schüler, J., & Baum, M. (2023). Entrepreneurial orientation as a theory of new value creation. The Journal of Technology Transfer, 48(5), 1752–1772. https://doi.org/10.1007/s10961-023-10021-1

Wali, J. A., Muthuveloo, R., Ping, T. A., & Bataineh, M. (2020). An overview of employees' dynamic capabilities, job performance with innovative work behavior: A conceptual paper. Global Journal of Management and Business Research: A Administration and Management, 20, 14. https://doi.org/10.1108/IJOA-05-2020-4534

Wamba, S. F., Gunasekaran, A., Akter, S., Ren, S. J., Dubey, R., & Childe, S. J. (2017a). Big data analytics and firm performance: Effects of dynamic capabilities. Journal of Business Research, 70, 356–365. https://doi.org/10.1016/j.jbusres.2016.08.009

Wang, C. L., & Ahmed, P. K. (2007). Dynamic capabilities: A review and research agenda. International Journal of Management Reviews, 9(1), 31–51. https://doi.org/10.1111/j.1468-2370.2007.00201.x

Wang, G., Mansor, Z. & Yee, C. L. (2024). Decoding employee digital performance: An in-depth literature analysis. Global Business Management Review, 16(1), 55-82. htps://doi.org/10.32890/gbmr 2023.16.1.4.

Wang, G., Mansor, Z. D., & Leong, Y. C. (2024a). 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. International Journal of Social Science Research, 12(1). htps://doi.org/10.5296/IJSSR.V12I1.21774

Wang, G., Mansor, Z. D., & Leong, Y. C. (2024). 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. Journal of Innovation and Entrepreneurship, 13(1), 37. https://doi.org/10.1186/s13731-024-00395-3.

Wang, G., Mansor, Z. D., & Leong, Y. C. (2024b). Linking digital leadership and employee digital performance in SMEs in China: The chain-mediating role of high-involvement human resource management practice and employee dynamic capability. Heliyon, 10(16), e36026. https://doi.org/10.1016/j.heliyon.2024.e36026

© COPYRIGHT UPM

Wang, G., Niu, Y., Mansor, Z. D., Leong, Y. C., & Yan, Z. (2024). Unlocking digital potential: Exploring the drivers of employee dynamic capability on employee digital performance in Chinese SMEs-moderation effect of competitive climate. Heliyon, 10(4), e25583. https://doi.org/10.1016/j.heliyon.2024.e25583

Wang, H., HU, X., & ALI, N. (2022). Spatial Characteristics and Driving Factors Toward the Digital Economy: Evidence from Prefecture-Level Cities in China. The Journal of Asian Finance, Economics and Business, 9(2), 419–426. https://doi.org/10.13106/JAFEB.2022.VOL9.NO2.0419

Wang, H., Wang, L., & Liu, C. (2018). Employee Competitive Attitude and Competitive Behaviour Promote Job-Crafting and Performance: A Two-Component Dynamic Model. Frontiers in Psychology, 9, 2223. https://doi.org/10.3389/fpsyg.2018.02223

Wang, T., Lin, X., & Sheng, F. (2022). Digital leadership and exploratory innovation: From the dual perspectives of strategic orientation and organisational culture. Frontiers in Psychology, 13, 902693. https://doi.org/10.3389/fpsyg.2022.902693

Wang, X., Gu, Y., Ahmad, M., & Xue, C. (2022a). The Impact of Digital Capability on Manufacturing Company Performance. Sustainability, 14(10), 6214. https://doi.org/10.3390/su14106214

Wang, Y., Jiang, B., & Wakuta, Y. (2022). How digital platform leaders can foster dynamic capabilities through innovation processes: The case of taobao. Technology Analysis & Strategic Management, 1–13. https://doi.org/10.1080/09537325.2022.2050690

Wang, X., & Sun, M. (2024). Enhancing SMEs resilience through digital innovation: a stage-based analysis. European Journal of Innovation Management. https://doi.org/10.1108/EJIM-09-2023-0800

Ward,M. K., & Meade, A. W. (2023). Dealing with careless responding in survey data: Prevention, identification, and recommended best practices. Annual Review of Psychology, 74(1), 577-596. https://doi.org/10.1146/annurev-psych-040422-045007

Warner, K. S., & Wäger, M. (2019). Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal. Long range planning, 52(3), 326-349. https://doi.org/10.1016/j.lrp.2018.12.001

Weber, E., Büttgen, M., & Bartsch, S. (2022). How to take employees on the digital transformation journey: An experimental study on complementary leadership behaviours in managing organisational change. Journal of Business Research, 143, 225–238. https://doi.org/10.1016/j.jbusres.2022.01.036

Wetzels, Odekerken-Schröder, & Van Oppen. (2009). Using PLS Path Modeling for Assessing Hierarchical Construct Models: Guidelines and Empirical Illustration. MIS Quarterly, 33(1), 177. https://doi.org/10.2307/20650284

© COPYRIGHT UPM

Whysall, Z., Owtram, M., & Brittain, S. (2019a). The new talent management challenges of Industry 4.0. Journal of Management Development, 38(2), 118–129. https://doi.org/10.1108/JMD-06-2018-0181

Wielgos, D. M., Homburg, C., & Kuehnl, C. (2021). Digital business capability: Its impact on firm and customer performance. Journal of the Academy of Marketing Science, 49(4), 762–789. https://doi.org/10.1007/s11747-021-00771-5

Wiesböck, F., Hess, T., & Spanjol, J. (2020). The dual role of IT capabilities in the development of digital products and services. Information & Management, 57(8), 103389. https://doi.org/10.1016/j.im.2020.103389

Wilden, R., & Gudergan, S. P. (2015). The impact of dynamic capabilities on operational marketing and technological capabilities: Investigating the role of environmental turbulence. Journal of the Academy of Marketing Science, 43(2), 181–199. https://doi.org/10.1007/s11747-014-0380-y

Wilden, R., Gudergan, S. P., Nielsen, B. B., & Lings, I. (2013). Dynamic Capabilities and Performance: Strategy, Structure and Environment. Long Range Planning, 46(1–2), 72–96. https://doi.org/10.1016/j.lrp.2012.12.001

Winter, S. G. (2003). Understanding dynamic capabilities. Strategic Management Journal, 24(10), 991–995. https://doi.org/10.1002/smj.318

Wright, P. M., McMahan, G. C., & McWilliams, A. (1994). Human resources and sustained competitive advantage: A resource-based perspective. The International Journal of Human Resource Management, 5(2), 301–326. https://doi.org/10.1080/09585199400000020

Wu, A., Song, D., & Liu, Y. (2022). Platform synergy and innovation speed of SMEs: The roles of organisational design and regional environment. Journal of Business Research, 149, 38–53. https://doi.org/10.1016/j.jbusres.2022.05.016

Wu, Y., Li, H., Luo, R., & Yu, Y. (2024). How digital transformation helps enterprises achieve high-quality development? Empirical evidence from Chinese listed companies. European Journal of Innovation Management, 27(8), 2753-2779. https://doi.org/10.1108/EJIM-11-2022-0610

Wuen, C. H., Ibrahim, F., & Ringim, K. J. (2021). Mediating effect of competitive strategy in the relationship between strategic human resource management and performance of small and medium enterprises in Brunei Darussalam. Middle East J. of Management, 8(2/3), 254. https://doi.org/10.1504/MEJM.2021.114010

Xi, M., Zhao, S., & Xu, Q. (2017). The influence of CEO relationship-focused behaviours on firm performance: A chain-mediating role of employee relations climate and employees' attitudes. Asia Pacific Journal of Management, 34(1), 173–192. https://doi.org/10.1007/s10490-016-9487-7

© COPYRIGHT UPM

Xie, L. (2019). Leadership and organisational learning culture: A systematic literature review. European Journal of Training and Development, 43(1/2), 76–104. https://doi.org/10.1108/EJTD-06-2018-0056

Xie, X., Fang, L., Zeng, S., & Huo, J. (2016). How does knowledge inertia affect firms product innovation? Journal of Business Research, 69(5), 1615–1620. https://doi.org/10.1016/j.jbusres.2015.10.027

Xie, Y., & Wu, D. (2024). How does competition policy affect enterprise digitization? Dual perspectives of digital commitment and digital innovation. Journal of Business Research, 178, 114651. https://doi.org/10.1016/j.jbusres.2024.114651

Xu, Y., Qian, H., Zhang, M., Tian, F., Zhou, L., & Zhao, S. (2023). Flexible human resource management systems and employee innovation performance in China – based on the moderated mediation effect. Chinese Management Studies, 17(6), 1259–1275. https://doi.org/10.1108/CMS-11-2021-0495

Yang, C., Fu, R., Wang, H., Jiang, Y., Zhang, S., & Ji, X. (2024). Evaluating the global prevalence of insomnia during pregnancy through standardised questionnaires and diagnostic criteria: A systematic review and meta-analysis. Frontiers in Psychiatry, 15, 1427255. https://doi.org/10.3389/fpsyt.2024.1427255

Yang, K., & Banamah, A. (2014). Quota Sampling as an Alternative to Probability Sampling? An Experimental Study. Sociological Research Online, 19(1), 56–66. https://doi.org/10.5153/sro.3199

Yang, S. (2023). Factors Influencing SME Growth Performance in China: A Conceptual Analysis. Journal of Digitainability, Realism & Mastery (DREAM), 2(03), 50–59. https://doi.org/10.56982/dream.v2i03.93

Yang, S. J. (2021). The effect of competitiveness on performance: investigating antecedents and consequences of employees' competitiveness (Doctoral dissertation, Macquarie University).

Yang, Y.-C. (2012). High-involvement human resource practices, affective commitment, and organisational citizenship behaviours. The Service Industries Journal, 32(8), 1209–1227. https://doi.org/10.1080/02642069.2010.545875

Yasir, M., & Majid, A. (2020). High-involvement HRM practices and innovative work behaviour among production-line workers: Mediating role of employee's functional flexibility. Employee Relations: The International Journal, 42(4), 883–902. https://doi.org/10.1108/ER-02-2018-0061

Yasmin, M., Tatoglu, E., Kilic, H. S., Zaim, S., & Delen, D. (2020). Big data analytics capabilities and firm performance: An integrated MCDM approach. Journal of Business Research, 114, 1–15. https://doi.org/10.1016/j.jbusres.2020.03.028

Ye, B. H., Tung, V. W. S., Li, J. J., & Zhu, H. (2020). Leader humility, team humility and employee creative performance: The moderating roles of task dependence

© COPYRIGHT UPM

and competitive climate. Tourism Management, 81, 104170. https://doi.org/10.1016/j.tourman.2020.104170

Yee, R. W. Y., Miquel-Romero, M.-J., & Cruz-Ros, S. (2021). Why and how to use enterprise social media platforms: The employee's perspective. Journal of Business Research, 137, 517–526. https://doi.org/10.1016/j.jbusres.2021.08.057

Yeow, A., Soh, C., & Hansen, R. (2018). Aligning with new digital strategy: A dynamic capabilities approach. The Journal of Strategic Information Systems, 27(1), 43–58. https://doi.org/10.1016/j.jsis.2017.09.001

Ying, Q., Hassan, H., & Ahmad, H. (2019). The Role of a Manager's Intangible Capabilities in Resource Acquisition and Sustainable Competitive Performance. Sustainability, 11(2), 527. https://doi.org/10.3390/su11020527

Yıldırım Özmutlu, S., & Arun, K. (2023). Orchestration of the complex environmental context: How does strategic management affect and dynamic capabilities mediate performance? Kybernetes, 52(12), 6144–6162. https://doi.org/10.1108/K-04-2022-0571

Yu, H., & Liu, H. (2022a). Discussion on Digital Transformation of Small and Medium-sized Enterprises in the Post-epidemic Era. Frontiers in Business, Economics and Management, 7(1), 91–105. https://doi.org/10.54097/fbem.v7i1.3760

Yuan, C., Xue, D., & He, X. (2021). A balancing strategy for ambidextrous learning, dynamic capabilities, and business model design, the opposite moderating effects of environmental dynamism. Technovation, 103, 102225. https://doi.org/10.1016/j.technovation.2021.102225

Zada, I. (2022). Organisational Change Management: Leadership Roles in Adapting New Norms. European Journal of Business and Management Research, 7(4), 1–5. https://doi.org/10.24018/ejbmr.2022.7.4.1477

Zahoor, N., Donbesuur, F., Christofi, M., & Miri, D. (2022). Technological innovation and employee psychological well-being: The moderating role of employee learning orientation and perceived organisational support. Technological Forecasting and Social Change, 179, 121610. https://doi.org/10.1016/j.techfore.2022.121610

Zahra, S. A., Sapienza, H. J., & Davidsson, P. (2006). Entrepreneurship and Dynamic Capabilities: A Review, Model and Research Agenda*. Journal of Management Studies, 43(4), 917–955. https://doi.org/10.1111/j.1467-6486.2006.00616.x

Zalaghi, H., & Khazaei, M. (2016). The Role of Deductive and Inductive Reasoning in Accounting Research and Standard Setting. Asian Journal of Finance & Accounting, 8(1), 23. https://doi.org/10.5296/ajfa.v8i1.8148

Zeike, S., Bradbury, K., Lindert, L., & Pfaff, H. (2019). Digital Leadership Skills and Associations with Psychological Well-Being. International Journal of

© COPYRIGHT UPM

Environmental Research and Public Health, 16(14), 2628. https://doi.org/10.3390/ijerph16142628

Zhang, J., Chen, Y., Li, Q., & Li, Y. (2023). A review of dynamic capabilities evolution—Based on organisational routines, entrepreneurship and improvisational capabilities perspectives. Journal of Business Research, 168, 114214. https://doi.org/10.1016/j.jbusres.2023.114214

Zhang, K., & Bu, C. (2024). Top managers with information technology backgrounds and digital transformation: Evidence from small and medium companies. Economic Modelling, 132, 106629. https://doi.org/10.1016/j.econmod.2023.106629

Zhang, M., Chen, X., Xie, H., Esposito, L., Parziale, A., Taneja, S., & Siraj, A. (2024). Top of tide: Nexus between organisation agility, digital capability and top management support in SME digital transformation. Heliyon, 10(10), e31579. https://doi.org/10.1016/j.heliyon.2024.e31579

Zhang, X., Chu, Z., Ren, L., & Xing, J. (2023). Open innovation and sustainable competitive advantage: The role of organisational learning. Technological Forecasting and Social Change, 186, 122114. https://doi.org/10.1016/j.techfore.2022.122114

Zhang, J., & Chen, Z. (2024). Exploring human resource management digital transformation in the digital age. Journal of the Knowledge Economy, 15(1), 1482-1498. https://doi.org/10.1007/s13132-023-01214-y

Zhang, X., Qi, Z., Ma, L., & Zhang, G. (2024). Assessing the Curvilinear Relationship in Employee Digital Performance: A Task-Technology Fit Perspective. International Journal of Human–Computer Interaction, 1–19. https://doi.org/10.1080/10447318.2024.2327181

Zhang, X., Xu, Y., & Ma, L. (2022a). Research on Successful Factors and Influencing Mechanism of the Digital Transformation in SMEs. Sustainability, 14(5), 2549. https://doi.org/10.3390/su14052549

Zhang, X., Xu, Y., & Ma, L. (2022b). Understanding the relationship between enterprise social media user adaptation, post-adoption use and employee performance. Behaviour & Information Technology, 1–19. https://doi.org/10.1080/0144929X.2022.2162437

Zhao, S., Liu, M., Xi, M., Zhu, C. J., & Liu, H. (2023). The role of leadership in human resource management: Perspectives and evidence from China. Asia Pacific Business Review, 29(1), 1–10. https://doi.org/10.1080/13602381.2023.2146901

Zhen, Z., Yousaf, Z., Radulescu, M., & Yasir, M. (2021). Nexus of Digital Organisational Culture, Capabilities, Organisational Readiness, and Innovation:

© COPYRIGHT UPM

Investigation of SMEs Operating in the Digital Economy. Sustainability, 13(2), 720. https://doi.org/10.3390/su13020720

Zhou, Q., & Zheng, X. (2024). Socially responsible human resource management and employee green behaviour at work: The role of learning goal orientation and moral identity. The International Journal of Human Resource Management, 35(1), 1–35. https://doi.org/10.1080/09585192.2023.2192358

Zhou, S., Wang, J., & Xu, B. (2022). Innovative coupling and coordination: Automobile and digital industries. Technological Forecasting and Social Change, 176, 121497. https://doi.org/10.1016/j.techfore.2022.121497

Zhu, J., Liao, Z., Yam, K. C., & Johnson, R. E. (2018). Shared leadership: A state-of-the-art review and future research agenda. Journal of Organisational Behaviour, 39(7), 834–852. https://doi.org/10.1002/job.2296

Zhu, J., Zhang, B., Xie, M., & Cao, Q. (2022). Digital Leadership and Employee Creativity: The Role of Employee Job Crafting and Person-Organisation Fit. Frontiers in Psychology, 13, 827057. https://doi.org/10.3389/fpsyg.2022.827057

Zoppelletto, A., Orlandi, L. B., Zardini, A., Rossignoli, C., & Kraus, S. (2023). Organisational roles in the context of digital transformation: A micro-level perspective. Journal of Business Research, 157, 113563. https://doi.org/10.1016/j.jbusres.2022.113563

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APPENDICES

SMEs Digital Development Survey: China

Statement: In adherence to ethical principles and confidentiality protocols, participant anonymity will be strictly maintained throughout the entirety of this study. To uphold this commitment, no identifying information, including names, will be disclosed, or utilised in any subsequent publications or research outputs. Additionally, the questionnaire employed in this research will not contain any elements that could reveal the identity of the participants.

Dear Valuable Respondent:

I am a Ph.D. Candidate at the School of Business and Economics, Universiti Putra Malaysia (UPM). As a part of the requirement for the degree, I am conducting research entitled "Antecedents for employee digital performance in SMEs in China with a competitive climate as moderator and, employee dynamic capability as the mediator". Therefore, I am pleased to invite you to participate in this study and provide your views on the factors being studied. Data will be gathered and analysed with strict confidentiality and the findings from this research will be used for academic purposes only. If you need any further information, please fill free to contact me at 406576737@qq.com/ gs63090@student.upm.edu.my

Thank you.

School of Business and Economics
Universiti Putra Malaysia

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Section A

Respondent's details

This section aims to collect information on respondents. Please indicate (√) on the appropriate option.

1. Gender:
1) Male 2) Female

2. Age：
1) 18-25 2)26-35 3)36-45 4) 50 above

3. Educational Background
1) Middle School below 2) Middle School 3) High school
4) Bachelor 5) Postgraduate students

4. Which province is your organisation:
1) Shanghai 2) Anhui 3) Guizhou 4) Guangzhou

6. Number of employees in your company
1) N<20 employees 2) 20 employees< N<300 employees
3) 300 employees < N<1000 employees 4) More than 1000 employees

7. The maturity level of each issue reported by each company pertains to the company's digital capability. We differentiate six maturity levels. Levels 0 and 1 correspond to a relatively low degree of digital maturity in the enterprise; levels 2 and 3 correspond to a moderate degree of digital maturity in the enterprise; levels 4 and 5 indicate a relatively high level of digital maturity in the enterprise; and levels 5 and 6 indicate more mature levels of digital development. Where do you think your organisation's digital maturity level is at that level?

Table 8.1 : Scale of digital maturity level

Bil.	Items	Digital maturity level
1	The enterprise you are affiliated with has sensed the significant advantages that digitisation brings to business growth.	—1—2—3—4—5—6—
2	Your organisation is developing a digital growth strategy and a digital development mindset.	—1—2—3—4—5—6—
3	Seizing digitally enabled growth potentials	—1—2—3—4—5—6—
4	Managing resources for digital transformation	—1—2—3—4—5—6—

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Section B

This section received data from respondents from Chinese SMEs about the level of digital leadership that consists of 6 items. Please indicate your level of agreement with these statements by circling the corresponding number according to the scale on digital leadership below.

Digital leadership: Digital leadership refers to a leader who demonstrates innovative thinking at a digital level, inspires and motivates employees within a digital environment, establishes effective communication channels with employees in the digital realm, and devises digital strategies for sustainable growth (Sagbas & Erdogan, 2022; Borah et al., 2022).

1 5

Strongly Disagree Strongly agree.

Table 8.2 : The Scale of Digital Leadership

Bil.	Items	Response
1	The leaders in our company recognise the network character by identifying the competencies and contacts of individual employees.	—1—2—3—4—5—
2	In our firm, leaders develop trust in the employees.	—1—2—3—4—5—
3	In our firm, leaders provide necessary information to employees.	—1—2—3—4—5—
4	In our firm, leaders act as learning guides and coaches.	—1—2—3—4—5—
5	Leaders are open to critique, feedback, and new ideas.	—1—2—3—4—5—
6	Leaders have high confidence in their capabilities because of the fast-changing environment.	—1—2—3—4—5—

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Section C

This section received data from respondents from Chinese SMEs about the level of digital capability consisting of 5 items. Please indicate your level of agreement with these statements by circling the corresponding number according to the scale of digital capability below.

Digital capability: Digital capability pertains to an individual's proficiency in effectively utilising digital technology to accomplish objectives. It encompasses a diverse set of skills and competencies, encompassing technical aptitude, digital literacy, fluency in digital tools, and adherence to principles of digital citizenship (Khin & Ho, 2019).

1 7

Strongly Disagree Strongly agree.

Table 8.3 : The Scale of Digital Capability

Bil.	Items	Response
1	Acquiring important digital technologies	—1—2—3—4—5—6 —7—
2	Identifying new digital opportunities	—1—2—3—4—5—6 —7—
3	Responding to digital transformation	—1—2—3—4—5—6 —7—
4	Mastering the state-of-the-art digital technologies	—1—2—3—4—5—6 —7—
5	Developing innovative products/services/processes using digital technology.	—1—2—3—4—5—6 —7—

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Section D

This section received data from respondents from Chinese SMEs about the level of HI-HRMPs consisting of 23 items. Please indicate your level of agreement with these statements by circling the corresponding number according to the scale on HI-HRMPs below.

HI-HRMP: HI-HRMP is defined as the powerful application of HRMPs, including capacity development, empowerment, fair rewards, information sharing, and recognition. This practice contributes to fostering employee readiness and enhancing trust among employees in the organisation's adoption of new technologies (Rubel et al., 2017).

Table 8.4 : The Scale of HI-HRMP

Bil.	Items	Response
0	Competency development (CD)	
1	Formal training and competency development activities are available in my organisation.	—1—2—3—4—5—
2	Comprehensive training and development programmes are available in my organisation.	—1—2—3—4—5—
3	My organisation has training programmes for new hires	—1—2—3—4—5—
4	My organisation provides training and competency development for problem-solving ability	—1—2—3—4—5—
0	Empowerment (EMP)	
1	I am given considerable latitude for the organisation of my work.	—1—2—3—4—5—
2	I have considerable freedom regarding the way I carry out my work	—1—2—3—4—5—
0	Fair rewards (FRWD)	—1—2—3—4—5—
1	I estimate my rewards as being fair internally	—1—2—3—4—5—
2	My reward is fair in comparison with what is offered for a similar job elsewhere	—1—2—3—4—5—
3	My reward level adequately reflects my level of responsibility in the organisation.	
0	Information sharing (IS)	—1—2—3—4—5—
1	I am regularly informed of updated information about my organisation.	—1—2—3—4—5—
2	I am regularly informed of my performance.	—1—2—3—4—5—
0	Recognition (REC)	—1—2—3—4—5—
1	When I do good quality work, my organisation appreciates me	
2	My supervisor tangibly recognises my efforts in different ways	—1—2—3—4—5—
3	My colleagues congratulate me in recognition of my efforts	—1—2—3—4—5—
0	Organisational Trust (OT)	—1—2—3—4—5—
1	Management at my organisation is sincere in its attempts to meet the workers' point of view	—1—2—3—4—5—
2	My management can be trusted to make sensible decisions for the organisation's future	—1—2—3—4—5—
3	My management at work seems to do an efficient job	—1—2—3—4—5—
4	I feel quite confident that my organisation will always try to treat me fairly	—1—2—3—4—5—

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Section E

This section received data from respondents from Chinese SMEs about the level of organisation learning consisting of 5 items. Please indicate your level of agreement with these statements by circling the corresponding number according to the scale of organisational learning below.

Organisational learning: Organisational learning is the process of acquiring knowledge. It is defined as a series of activities, including systematically solving problems, trial and error, learning from mistakes, learning from others, and accelerating the dissemination of knowledge within the organisation (Li & Wang, 2022).

1 5

Strongly Disagree strongly agree.

Table 8.5 : The Scale of Organisational Learning

Bil.	items	response
1	Our organisation encourages employees to attend training sessions to acquire new knowledge	—1—2—3—4—5—
2	Our organisation considers employees' learning as an investment in knowledge creation	—1—2—3—4—5—
3	Our organisation encourages employees to store the learning they earn	—1—2—3—4—5—
4	Our organisation has broad training processes where employees can share knowledge	—1—2—3—4—5—
5	Our organisation encourages employees to continue their education, which will be a benefit to the organisation	—1—2—3—4—5—

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Section F

This section received data from respondents from Chinese SMEs about the level of competitive climate consisting of 4 items. Please indicate your level of agreement with these statements by circling the corresponding number according to the scale of the competitive climate below.

Competitive climate: A competitive climate is a type of organisational climate where employees are forced to compare their performance with others, creating pressure and a competitive feeling (Wang et al., 2018).

1 5

Strongly Disagree Strongly agree

Table 8.6 : The Scale of Competitive Climate

Bil.	Items	Response
1	My manager frequently compares my results with those of other employees.	—1—2—3—4—5—6—7——
2	The amount of recognition you get in this company depends on how your performance ranks compared to other employees.	—1—2—3—4—5—6—7——
3	Everybody is concerned with finishing at the top of the performance rankings.	—1—2—3—4—5—6—7——
4	My coworkers frequently compare their results with mine.	—1—2—3—4—5—6—7——

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Section G

This section received data from respondents from Chinese SMEs about the level of employee dynamic capability (EDC) consisting of 6 items. Please indicate your level of agreement with these statements by circling the corresponding number according to the scale on EDC below.

EDC: The capacity to combine, develop, and adapt employees' skills in response to a swiftly evolving environment that directly impacts task execution within the workplace. Employee Dynamic Capabilities (EDCs) encompass both the flexibility to adapt and solve immediate challenges, as well as the long-term enhancement of work processes within specific job roles (Bieńkowska & Agnieszka, 2020).

1 7

Strongly Disagree Strongly agree

Table 8.7 : The Scale of Employee Dynamic Capability

NO	Items	Response
1	Change sensitivity—item 1: I quickly notice and successfully recognise in the environment (both inside and outside of the organisation) opportunities and threats (including early warning signals) that can affect the work I do.	—1—2—3—4—5—6—7
2	Change adaptation—item 1: I adapt effectively to the opportunities and threats appearing in the environment (both inside and outside the organisation). I undertake preventive actions that will enable me to carry out the tasks entrusted to me despite changes in the environment.	—1—2—3—4—5—6—7
3	Change sensitivity—item 2: I quickly notice and successfully recognise problems appearing at the workplace	—1—2—3—4—5—6—7
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.	—1—2—3—4—5—6—7
5	Problem-solving and innovative approach—item 2: I generate innovative ideas and original solutions to problems.	—1—2—3—4—5—6—7
6	Personal development—item 1: I constantly develop my competencies and raise my qualifications. I develop myself through my work.	—1—2—3—4—5—6—7

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Section H

This section received data from respondents from Chinese SMEs about the level of employee digital performance (EDP) consisting of 6 items. Please indicate your level of agreement with these statements by circling the corresponding number according to the scale on EDP below.

Employee digital performance (EDP): We categorise the performance of employees in the digital realm into two interconnected dimensions: digital-enabled task performance and innovative performance. Digital-enabled task performance refers to employees utilising digital technologies to efficiently complete regular and repetitive responsibilities, while digital-enabled innovative performance entails employees utilising digital technologies to foster innovation while fulfilling their tasks (Shao et al.,2022).

1 5

Strongly Disagree Strongly agree

Table 8.8 : The Scale of Employee Digital Performance

Bil.	Items	Response
1	I find solutions to work problems after performing analytics with the big data generated by smart/digital technologies.	—1—2—3—4—5—
2	I need less time to complete job tasks by analysing big data.	—1—2—3—4—5—
3	The quality of my work has been improved with analytics of big data.	—1—2—3—4—5—
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.	—1—2—3—4—5—
5	I come up with creative solutions to task problems through data analytics.	—1—2—3—4—5—
6	I try new and innovative ideas at work when performing analytics with big data.	—1—2—3—4—5—

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Questionnaire Translation

中国中小企业数字化发展调查

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亲爱的朋友:

我是马来西亚博特拉大学（UPM）商业与经济学院的一名博士生。作为学位要求的一部分，我正在进行一项题为 “以竞争氛围为调节因素，以员工动态能力为中介，中国中小企业员工数字化绩效的前因 “的研究。因此，我很高兴邀请您参与这项研究，并就所研究的因素发表您的看法。数据的收集和分析将严格保密，研究结果仅用于学术目的。如果您需要更多信息，请随时通过 406576737@qq.com/ gs63090@student.upm.edu.my 与我联系。

再次感谢您的参与

商业与经济学院
马来西亚博特拉大学

A 部分

受访者详细信息

本部分旨在收集受访者的信息。请在适当的选项上打”√”。

1.性别：
1）男　　2）女性

2.年龄：
1）18-25　　2）26-35　　3）36-45　　4）50 岁以上

3. 教育背景
1）初中以下　　2）初中　　3）高中　　4）学士　　5）研究生

4. 贵单位所在省份
1）上海　　2）安徽　　3）贵州　　4）广州

6. 贵公司员工人数
1）<20 名员工　　2）20 名员工 < 300 名员工
3）300 名员工 < 1000 名员工　　4）超过 1000 名员工

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7.每家公司报告的每个问题的成熟度都与公司的数字化能力有关。我们将成熟度分为六个等级。0 级和 1 级表示企业的数字化成熟度相对较低；2 级和 3 级表示企业的数字化成熟度处于中等水平；4 级和 5 级表示企业的数字化成熟度处于较高水平；5 级和 6 级表示企业的数字化发展处于更成熟的水平。您认为贵组织的数字化成熟度处于哪个级别？

表 8.1： 数字化成熟度等级表

序号	内容	数字化成熟度
1	您所在的企业已经意识到数字化为业务增长带来的巨大优势。	—1—2—3—4—5—6—
2	您的组织正在制定数字化发展战略和数字化发展思路。	—1—2—3—4—5—6—
3	抓住数字化带来的增长潜力	—1—2—3—4—5—6—
4	为数字化转型管理资源	—1—2—3—4—5—6—

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B 部分

本部分收集了来自中国中小企业的受访者关于数字化领导力水平的数据，包括 6 个项目。请根据以下有关数字化领导力的量表，圈出相应的数字，以表示您对这些陈述的同意程度。

数字化领导力： 数字化领导力是指领导者在数字化层面展现创新思维，在数字化环境中激发和激励员工，在数字化领域建立与员工的有效沟通渠道，并制定可持续增长的数字化战略(Sagbas & Erdogan，2022)。

1 5

非常不同意 非常同意

表 8.2：数字化领导力量表

序号	问题	评分
1	我们公司的领导通过识别员工个人的能力和人脉，认识到网络的特性。	—1—2—3—4—5—
2	在我们公司，领导者要培养员工的信任感。	—1—2—3—4—5—
3	在我们公司，领导会向员工提供必要的信息。	—1—2—3—4—5—
4	在我们公司，领导者是学习的指导者和教练。	—1—2—3—4—5—
5	领导者乐于接受批评、反馈和新想法。	—1—2—3—4—5—
6	由于环境瞬息万变，领导者对自己的能力信心十足。	—1—2—3—4—5—

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C 部分

本部分收集了来自中国中小企业的受访者关于数字化能力水平的数据，包括 5 个项目。请根据下面的数字化能力等级表，在相应的数字上划圈，以表示您对这些陈述的同意程度。

数字能力： 数字能力是指个人有效利用数字技术实现目标的熟练程度。它包含一系列不同的技能和能力，包括技术能力、数字素养、流利使用数字工具以及遵守数字公民原则 (Bongiorno&Giorgio,2018)。

1 5

非常不同意 非常同意

表 8.3：数字化领导力量表

序号	问题	评分
1	获取重要的数字技术	—1—2—3—4—5—6 —7—
2	发现新的数字机遇	—1—2—3—4—5—6 —7—
3	应对数字化转型	—1—2—3—4—5—6 —7—
4	掌握最先进的数字技术	—1—2—3—4—5—6 —7—
5	利用数字技术开发创新产品/服务/流程。	—1—2—3—4—5—6 —7—

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D 部分

本部分收集了来自中国中小企业的受访者关于 HI-HRMPs 水平的数据，包括 23 个项目。请根据以下关于 HI-HRMPs 的量表在相应的数字上划圈，以表示您对这些陈述的同意程度。

HI-HRMP：HI-HRMP：HI-HRMP 被定义为人力资源规划的有力应用，包括能力发展、授权、公平奖励、信息共享和认可。在组织采用新技术的过程中，这种做法有助于促进员工做好准备，增强员工之间的信任(Li &Wang,2022)。

表 8.4：HI-HRMP 的规模

序号	问题	评分
0	能力培养 (CD)	
1	我所在的组织有正式的培训和能力发展活动。	—1—2—3—4—5—
2	我所在的组织提供全面的培训和发展计划。	—1—2—3—4—5—
3	我的组织为新员工提供程序员培训	—1—2—3—4—5—
4	我所在的组织提供解决问题能力的培训和能力发展	—1—2—3—4—5—
0	赋权（EMP）	
1	我在工作安排上有很大的自由度。	—1—2—3—4—5—
2	我在工作方式上有相当大的自由度。	—1—2—3—4—5—
0	公平报酬（FRWD）	—1—2—3—4—5—
1	我估计我的回报在内部是公平的。	—1—2—3—4—5—
2	与其他地方类似工作的报酬相比，我的报酬是公平的。	—1—2—3—4—5—
3	我的奖励水平充分反映了我在组织中的责任水平。	
0	信息共享 (IS)	—1—2—3—4—5—
1	我定期了解本组织的最新信息。	—1—2—3—4—5—
2	我定期了解自己的工作表现。	—1—2—3—4—5—
0	认可（REC）	—1—2—3—4—5—
1	当我完成高质量的工作时，我的组织会欣赏我。	
2	我的上司以不同的方式切实认可我的努力。	—1—2—3—4—5—
3	我的同事们向我表示祝贺，对我的努力表示认可。	—1—2—3—4—5—
0	组织信任（OT）	—1—2—3—4—5—
1	我所在单位的管理层真诚地试图满足工人的观点。	—1—2—3—4—5—
2	我的管理层值得信赖，他们会为组织的未来做出明智的决定。	—1—2—3—4—5—
3	我工作的管理层似乎工作效率很高。	—1—2—3—4—5—
4	我很有信心，我的组织会一直努力公平地对待我。	—1—2—3—4—5—

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E 部分

本部分收集了来自中国中小企业的受访者关于组织学习水平的数据，包括 5 个项目。请根据下面的组织学习量表，在相应的数字上划圈，以表示您对这些陈述的同意程度。

组织学习： 组织学习是获取知识的过程。它被定义为一系列活动，包括系统地解决问题、试错、从错误中学习、向他人学习以及加速知识在组织内的传播 (Li & Wang, 2022).

1 5

非常不同意 非常同意

表 8.5：组织学习量表

序号	问题	评分
1	我们的组织鼓励员工参加培训课程以获取新知识。	—1—2—3—4—5—
2	我们的组织将员工的学习视为对知识创造的投资。	—1—2—3—4—5—
3	我们的组织鼓励员工存储他们获得的学习成果。	—1—2—3—4—5—
4	我们的组织有广泛的培训流程，员工可以分享知识。	—1—2—3—4—5—
5	我们的组织鼓励员工继续接受教育，这对组织大有裨益。	—1—2—3—4—5—

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F 部分

本部分收集了来自中国中小企业的受访者关于竞争环境水平的数据，包括 4 个项目。请根据下面的竞争环境等级表，圈出相应的数字，以表示您对这些陈述的同意程度。

竞争氛围： 竞争氛围是一种组织氛围，在这种氛围中，员工被迫将自己的业绩与他人进行比较， 从而产生压力和竞争感（Kohn，1992 年）。

1 5

非常不同意 非常同意

表 8.6：竞争性环境的规模

序号	问题	评分
1	我的经理经常将我的成绩与其他员工的成绩进行比较。	—1—2—3—4—5—6—7——
2	在这家公司，你能获得多少认可取决于你的业绩与其他员工相比的排名。	—1—2—3—4—5—6—7——
3	每个人都希望自己的成绩名列前茅。	—1—2—3—4—5—6—7——
4	我的同事经常将他们的结果与我的结果进行比较。	—1—2—3—4—5—6—7——

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G 部分

本部分收集了来自中国中小企业的受访者关于员工动态能力（EDC）水平的数据，包括 6 个项目。请根据以下关于 EDC 的量表在相应的数字上划圈，以表示您对这些陈述的同意程度。

员工动态能力（EDC）：针对直接影响工作场所任务执行的迅速变化的环境，组合、开发和调整员工技能的能力。员工动态能力（EDCs）既包括适应和解决当前挑战的灵活性，也包括在特定工作角色内长期改进工作流程的能力(Bieńkowska&Agnieszka，2020).

1 7

非常不同意 非常同意

表 8.7：员工动态能力表

序号	问题	评分
1	对变化的敏感度--项目 1：我能迅速注意到并成功识别环境（组织内部和外部）中可能影响我所从事工作的机会和威胁（包括预警信号）。	—1—2—3—4—5—6—7
2	变化适应--项目 1：我有效地适应环境（组织内外）中出现的机遇和威胁。我采取预防措施，使我能够在环境发生变化的情况下完成交给我的任务。	—1—2—3—4—5—6—7
3	变化敏感度--项目 2：我能迅速注意到并成功识别工作场所出现的问题。	—1—2—3—4—5—6—7
4	解决问题和创新方法--项目 1：我能迅速解决出现的问题，我自己做或寻求支持（在知识 和信息范围内），使我能够完成分配的任务。	—1—2—3—4—5—6—7
5	解决问题和创新方法--项目 2：我能提出创新的想法和解决问题的原创方案。	—1—2—3—4—5—6—7
6	个人发展--项目 1：我不断发展自己的能力，提高自己的资历。我通过工作发展自己。	—1—2—3—4—5—6—7

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H 部分

本部分收集了来自中国中小企业的受访者关于员工数字化绩效（EDP）水平的数据，包括 6 个项目。请根据下面的 EDP 量表在相应的数字上划圈，以表示您对这些陈述的同意程度。

员工数字化绩效（EDP）： 我们将员工在数字化领域的绩效分为两个相互关联的维度：数字化任务绩效和创新绩效。数字化任务绩效是指员工利用数字化技术高效地完成常规和重复性工作，而数字化创新绩效是指员工利用数字化技术在完成任务的同时促进创新 (Shao et al.,2022)。

1 5

非常不同意 非常同意

表 8.8：员工数字化绩效量表

序号	问题	评分
1	在对智能/数字技术产生的大数据进行分析后，我找到了解决工作问题的方法。	—1—2—3—4—5—
2	通过分析大数据，我需要更少的时间来完成工作任务。	—1—2—3—4—5—
3	大数据分析提高了我的工作质量。	—1—2—3—4—5—
4	我通过对智能/数字技术产生的大数据进行分析，尝试创新方法来提高业务绩效或产品/服务质量。	—1—2—3—4—5—
5	我通过数据分析为任务问题提出创造性的解决方案。	—1—2—3—4—5—
6	在利用大数据进行分析时，我在工作中尝试新的创新想法。	—1—2—3—4—5—

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Appendix A

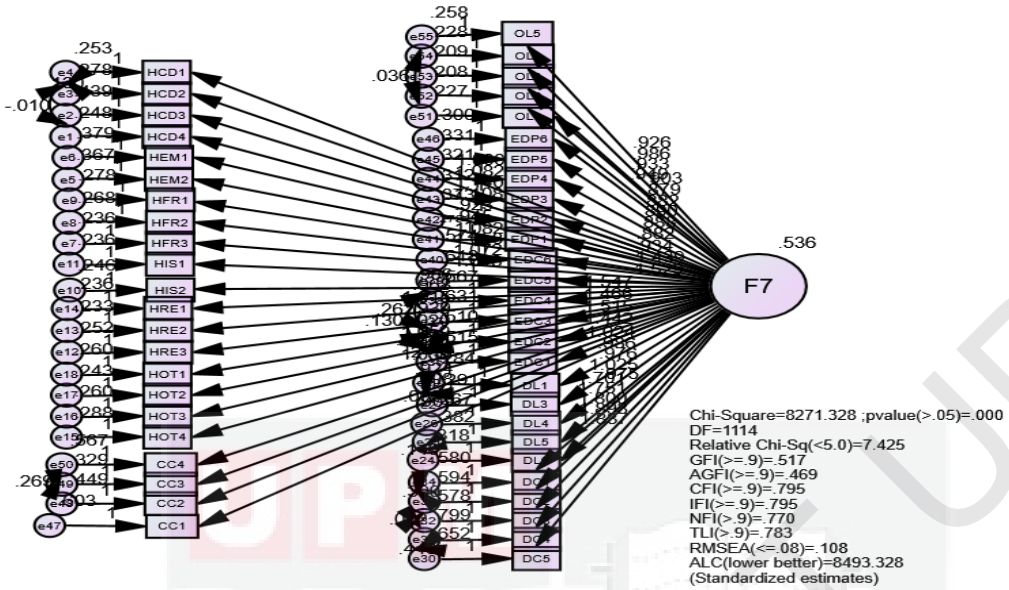

Figure 8.1 : Mode fit of Common methodology bias

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Appendix B

Table 8.9 : An Overview of Employee Digital Performance

NO	Author	Independent	Mediator	Moderator	Industries	Methods
A1	Keller et al 2019	Digital assistance systems			Manufacturing industry	Quantitative
A2	Listyorini & Susanty,2019	Corporate internal communication using digital technology			IT companies	Quantitative
A3	Cini,2023	DT (Quantitative); senior management, resistance to transformation, education, and ability to use technology, workload, complexity and uncertainty, speed, satisfaction, motivation, continuity, quality, and work-life imbalance(qualitative)	Technostress (Techno overload; Techno complexity; Techno uncertainty)		Public Institutions	Mixed method
A4	Nguyen et al.,2023	The use of technology-based knowledge sharing (TBKS)		HRM, training, transformational leadership, and organisational resources	Vietnam companies	Quantitative
A5	Ravi,2021	Storage network, operating cost, client reporting, cloud system, and money laundering. operations, quality, strategy, security, and technology	Disruptive technologies		Investment banks	Quantitative
A6	Cahyadi et al.,2022	Leadership styles (servant, shared, and empowering)			SMEs	Quantitative
A7	Wang et al.,2021	Social media fear		COVID-19 vaccine	Random	Quantitative
A8	Benitez et al.,2022	Digital leadership capability; digital training.	Platform digitisation capability		European firms	Mixed
A9	Adhiatma et al.,2022	Learning experience; personal dexterity		Incentive gamification	marketing department	Quantitative
A10	Manley&Williams,2022	Emerging technologies and surveillance practices			Premiership Rugby Football Union	Case study
A11	Hoffmann &Thommes,2020	Digital feedback	energy-efficient		Car company	Interview
A12	Narayana Murthy &Tortorella,2021	COVID-19's work implications (i.e. home office work environment, job insecurity and virtual connection)		I4.0base technologies		Quantitative
A13	Guzman-Ortiz et al.,2020	The customer service experience, the collaborator's capabilities and processes based on digital transformation			insurance companies	Quantitative
A14	Louati &Hadoussa,2021	Social media use in the workplace	Knowledge sharing; Knowledge donating; Knowledge collecting		telecommunication company	Quantitative
A15	Ritala et al.,2021	Individual-level proactiveness orientation ; Individual-level risk-taking orientation ; Individual-level innovativeness orientation		Employee's intrafirm relational capital	a medium-sized Northern European manufacturing firm	Quantitative
A16	Carreri et al.,2023	Relational space			Retail banking industry	Case study
A17	Kamdjoug et al.,2023	information and communications technology use; User satisfaction.				Quantitative

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A18	Deng et al.,2022	End-user computing satisfaction	high-activated positive emotions and innovative work behaviours		relevant enterprises	Quantitative
A19	Uzkurt et al.,2023	the technology acceptance perceptions (Perceived usefulness (PU) and Perceived ease of use (PEOU) of mobile applications)	SME employees' motivation		SMEs	Quantitative
A20	Pacheco & Coello-Montecel,2023	digital competencies	psychological empowerment		Ecuadorian telecommunications companies	Quantitative
A21	Duan et al.,2023	Technology affordance (Affordance for coordination, communication, knowledge sharing, and decision-making)	Work-life balance		A full or part-time basis in Australia	Quantitative
A22	Topcuoglu et al.,2023	social loafing		Digital leadership		Quantitative
A23	Li et al.,2022	Leader after-hours electronic communication expectations	organisation-based self-esteem; stress perception; reputation maintenance concerns	self-leadership		multi-wave, multi-source field study
A24	Borgia et al.,2022	work-life balance	technological knowledge risks	digitalisation, old technologies, and cybercrime	Employee of CCB	Quantitative
A25	Shao et al.,2022	Top management support and Transformational supervisory leadership	data-driven culture, digital self-efficacy.		Automobile manufacturing AND multiple joint ventures across different industries.	Quantitative
A26	Kuegler et al.,2016	enterprise social software platforms (ESSPs)	task performance and employee innovation	task equivocality	Medico's employees	Quantitative
A27	Ali-Hassan et al.,2015	social media use (social, hedonic, and cognitive)	social capital (structural, relational, and cognitive)		A large multinational Information Technology company.	Quantitative
A28	Christ-Brendemuhl,2022	Unreliable or unintuitive systems as well as Technology-induced role overload	technostress		technology usage in full-service restaurants.	interview study
A29	Zhang et al.,2022	various adaptation behaviours of information system users	enterprise social media post-adoption	ESM self-efficacy	Enterprise of social media use	Quantitative

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Appendix C

Table 8.10 : Multicollinearity

Model				Standardised Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	VIF
1	(Constant)	0.511	0.113		4.520	0.000		
DL	DL1	0.107	0.037	0.129	2.906	0.004	0.232	4.307
	DL2	-0.070	0.040	-0.082	-1.776	0.076	0.211	4.742
	DL3	-0.027	0.040	-0.032	-0.682	0.495	0.213	4.705
	DL4	0.058	0.042	0.065	1.364	0.173	0.198	5.038
	DL5	0.063	0.035	0.078	1.794	0.073	0.244	4.103
	DL6	-0.080	0.036	-0.092	-2.234	0.026	0.266	3.758
DC	DC1	0.032	0.035	0.060	0.920	0.358	0.108	9.292
	DC2	0.018	0.034	0.034	0.517	0.605	0.104	9.614
	DC3	-0.007	0.032	-0.013	-0.211	0.833	0.117	8.516
	DC4	-0.045	0.030	-0.094	-1.504	0.133	0.118	8.502
	DC5	0.022	0.031	0.044	0.707	0.480	0.118	8.465
HI-HRMP	HRCD1	0.029	0.043	0.034	0.682	0.496	0.185	5.398
	HRCD2	0.021	0.043	0.026	0.488	0.625	0.160	6.252
	HRCD3	-0.128	0.031	-0.173	-4.126	0.000	0.260	3.853
	HRCD4	0.030	0.041	0.037	0.735	0.462	0.182	5.498
	HREM1	-0.039	0.036	-0.046	-1.087	0.278	0.257	3.885
	HREM2	0.107	0.038	0.126	2.861	0.004	0.235	4.259
	HRFR1	-0.075	0.041	-0.090	-1.811	0.071	0.184	5.439
	HRFR2	0.014	0.041	0.017	0.348	0.728	0.194	5.156
	HRFR3	-0.019	0.042	-0.022	-0.441	0.659	0.190	5.260
	HRIS1	0.013	0.040	0.015	0.319	0.750	0.216	4.625
	HRIS2	0.024	0.040	0.027	0.597	0.551	0.225	4.435
	HRR1	0.025	0.043	0.028	0.589	0.556	0.205	4.884
	HRR2	-0.025	0.045	-0.027	-0.546	0.585	0.181	5.531
	HRR3	0.105	0.041	0.114	2.562	0.011	0.229	4.362
	HROT1	0.044	0.040	0.051	1.113	0.266	0.216	4.640
	HROT2	-0.092	0.045	-0.109	-2.056	0.040	0.163	6.142
	HROT3	-0.035	0.042	-0.040	-0.832	0.406	0.198	5.040
	HROT4	0.075	0.040	0.090	1.864	0.063	0.194	5.166
OL	OL1	0.024	0.043	0.025	0.550	0.582	0.215	4.662
	OL2	0.042	0.043	0.046	0.979	0.328	0.207	4.820
	OL3	0.059	0.045	0.062	1.306	0.192	0.200	4.995
	OL4	0.026	0.040	0.029	0.638	0.524	0.227	4.396
	OL5	0.089	0.039	0.098	2.282	0.023	0.249	4.014
CC	CC1	0.113	0.031	0.144	3.632	0.000	0.290	3.453
	CC2	-0.054	0.037	-0.066	-1.491	0.136	0.233	4.293
	CC3	0.063	0.034	0.069	1.846	0.065	0.323	3.091
	CC4	0.021	0.030	0.027	0.709	0.479	0.316	3.162
EDC	EDC1	0.043	0.031	0.071	1.387	0.166	0.172	5.806
	EDC2	0.025	0.036	0.043	0.708	0.479	0.125	8.013
	EDC3	0.079	0.032	0.135	2.482	0.013	0.155	6.461
	EDC4	0.007	0.036	0.012	0.198	0.843	0.117	8.531
	EDC5	0.088	0.031	0.153	2.815	0.005	0.153	6.532
	EDC6	0.007	0.031	0.012	0.229	0.819	0.172	5.827

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Appendix D

Table 8.11 : The List of Surveyed Chinese SMEs

No.	Company Name	Inventory number	No. of employees
	This study investigates information on SMEs in the Anhui region		
1	Anhui Jiaxinda Intelligent Technology Co.	2023340104A0018060	104
2	Anhui Imagen Intelligent Technology Co.	2023340111A8018062	160
3	Maanshan Fuming Instrument Manufacturing Co.	2023340521A8018072	180
4	Hefei A Digital Cloud Information Technology Co.	2023340104A0018097	170
5	Chuzhou Yubo Electromechanical Technology Co.	2023341102A8018116	150
6	Wuhu Chuangsheng Elevator Engineering Co.	2023340202A0018127	230
7	Lu'an Ailuoqi Clothing Co.	2023341503A0018136	145
8	Huaibei Miaolinsen Bioenergy Technology Co.	2023340602A0018153	147
9	Huainan Aneng Electronics Co.	2023340402A8018164	149
10	Bengbu Huabang Silicone-based Material Technology Co.	2023340304A8018209	147
11	Tianchang Tianan Software Service Co.	2023341181A0018250	103
12	Chaohu Hengmao Machinery Equipment Co.	2023340181A0018262	150
13	Bozhou Qiao Cheng District Tao Da Sheng Network Technology Service Co.	2023341602A0018469	167
14	Suzhou Shenglong New Material Technology Co.	2023340824A0019097	90
15	Ningguo Tiantian Wear-resistant Material Co.	2023341881A0019105	148
	This study investigates information on SMEs in the Shanghai region		112
1	Shanghai Haokong Digital Technology Co.	2023310105A0020787	109
2	Shanghai Xinchao Leite Automotive Technology Co.	2023310115A8020798	107
3	Prinaberg BioPharma R&D (Shanghai) Co.	2023310115A8020810	170
4	Jiatang (Shanghai) Agricultural Technology Co.	2023310115A0020821	156
5	Shanghai Crown Belt Ventilation & Energy Saving Equipment Co.	2023310120A8020826	145
6	Shanghai Xinwei Semiconductor Co.	2023310112A0020843	156
7	Shanghai Kaijing Colour Steel Co.	2023310115A0020849	145
8	Shadowdee Information Technology (Shanghai) Co.	2023310116A8020883	154
9	Shanghai Light Enjoy Internet Technology Co.	2023310112A8020919	131

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10	Shanghai Tiger Robotics Co.	2023310115A0020956	132
11	Shanghai Gendai Digital Technology Co.	2023310106A0020962	123
12	Shanghai Yuanzan Medical Technology Co.	2023310116A0020963	121
13	Anain (Shanghai) Supply Chain Management Co.	2023310118A0020968	142
14	Shanghai Sunrise Transmission Technology Co.	2023310106A0020991	142
15	Shanghai Jiding Network Technology Co.	2023310120A0021000	122
	This study investigates information on SMEs in the Guizhou region		132
1	Guizhou Tiandi Zhichuang Technology Co.	2023520102A8001341	90
2	Liupanshui Yitong Technology Development Co.	2023520201A8001411	56
3	Zunyi Changzheng Electrical Equipment Co.	2023520302A8001474	112
4	Anshun Zhonghuicheng Electromechanical Technology Co., Ltd.	2023520402A0001617	123
5	Zunyi Zhongchang Network Technology Co., Ltd.	2023520302A8001631	126
6	Guiyang Jiehui Digital Innovation Centre Co., Ltd.	2023520102A0001637	123
7	Guizhou Chuangyi Baoneng Energy-Saving Technology Co., Ltd.	2023520103A0001591	143
8	Guizhou Sanchao Technology Information Systems Co., Ltd.	2023520102A8001492	143
9	Guizhou Titan Electrical Systems Co., Ltd.	2023520102A0001487	143
10	Zunyi Baojingyuan Technology Co., Ltd.	2023520303A8001481	143
11	Anshun Lianshunda Technology Co., Ltd.	2023520402A0001505	143
12	Guizhou Yirong Technology Group Co., Ltd.	2023520102A0001513	70
13	Guizhou Xunteng Technology Co., Ltd.	2023520201A8001524	143
14	Guizhou Zhong'an Xinyue Technology Co., Ltd.	2023520103A0001529	143
15	Guizhou Excellence Actuarial Software Development Co., Ltd.	2023520102A0001537	143
	This study investigates information on SMEs in the Guangdong region		143
1	Dongguan Furanshi Lighting Technology Co.	2023441901A8049377	132
2	Zhuhai Apogee Software Co.	2023440402A8049378	142
3	Zhaoqing Yicheng Yi Network Technology Co.	2023441202A8049444	143
4	Foshan Jinle Automation Technology Co.	2023440606A8049449	143
5	Zhongshan Guancai Film Technology Co.	2023442001A0049451	132

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6	Jiangmen Three Arrows Photoelectric Technology Co.	2023440703A8049576	52
7	Jiangmen Quanda Machinery Manufacturing Co.	2023440703A8049581	143
8	Zhanjiang Zhenghai Biotechnology Co.	2023440804A8049591	143
9	Jiangmen Xiehua Electronic Technology Co.	2023440703A8049719	145
10	Zhuhai Junfeng Technology Co.	2023440402A8049764	123
11	Zhuhai Zhongyun Education Technology Co.	2023440402A0049977	113
12	Dongguan Panther Electronic Technology Co.	2023441901A0049982	121
13	Dongguan Taili Electronic Machinery Co., Ltd.	2023441901A8050163	112
14	Zhongke Kangyuan (Guangdong) Biotechnology Co., Ltd.	2023440118A0050191	413
15	Guangdong Vegetable King Network Technology Co., Ltd.	2023441901A0050207	112

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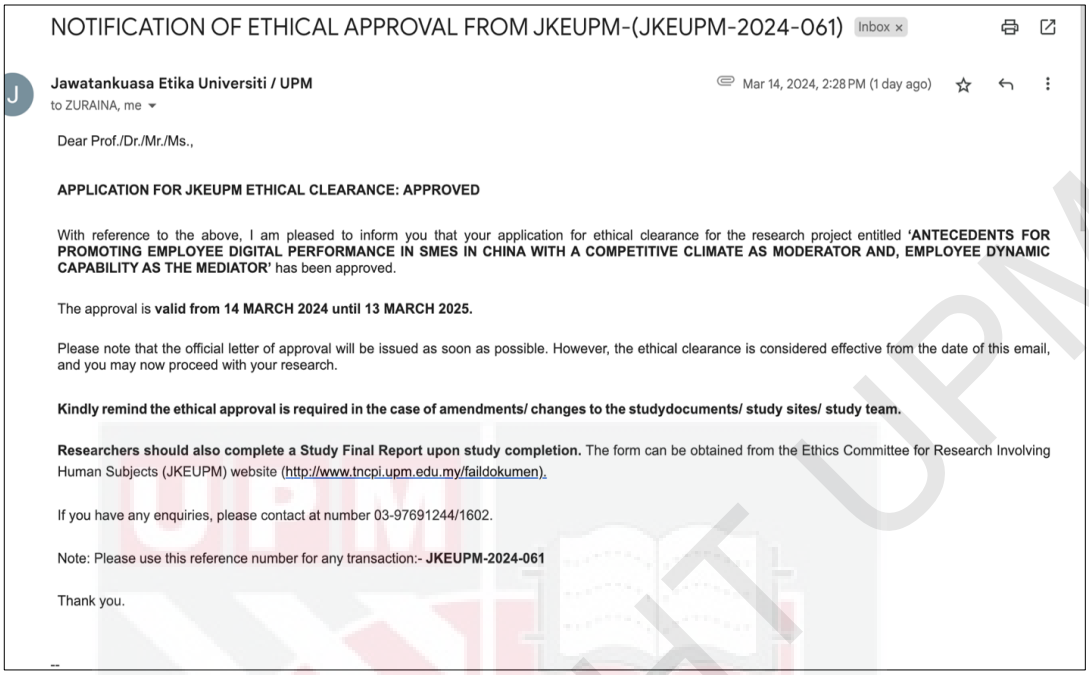
Appendix E



NOTIFICATION OF ETHICAL APPROVAL FROM JKEUPM-(JKEUPM-2024-061) Inbox ×

Jawatankuasa Etika Universiti / UPM Mar 14, 2024, 2:28 PM (1 day ago)

to ZURAINA, me

Dear Prof./Dr./Mr./Ms.,

APPLICATION FOR JKEUPM ETHICAL CLEARANCE: APPROVED

With reference to the above, I am pleased to inform you that your application for ethical clearance for the research project entitled **'ANTECEDENTS FOR PROMOTING EMPLOYEE DIGITAL PERFORMANCE IN SMES IN CHINA WITH A COMPETITIVE CLIMATE AS MODERATOR AND, EMPLOYEE DYNAMIC CAPABILITY AS THE MEDIATOR'** has been approved.

The approval is **valid from 14 MARCH 2024 until 13 MARCH 2025.**

Please note that the official letter of approval will be issued as soon as possible. However, the ethical clearance is considered effective from the date of this email, and you may now proceed with your research.

Kindly remind the ethical approval is required in the case of amendments/ changes to the studydocuments/ study sites/ study team.

Researchers should also complete a Study Final Report upon study completion. The form can be obtained from the Ethics Committee for Research Involving Human Subjects (JKEUPM) website (http://www.tncpi.upm.edu.my/faildokumen).

If you have any enquiries, please contact at number 03-97691244/1602.

Note: Please use this reference number for any transaction:- **JKEUPM-2024-061**

Thank you.

--

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Appendix F1

Evidence for a panel of Experts: Content validity report

Candidate Background information

Name	Wang Guifang
Matric No.	GS63090
Program	Doctor of Philosophy in Business and Economics
Awarding institution	Universiti Putra Malaysia (UPM)
Faculty	Faculty of Business and Economics
Thesis title	Antecedents for Employee Digital Performance in China's SMEs with Competitive Climate as Moderator and Employee Dynamic Capability as Mediator.

Appendix F2

Validation Report of Panel 2

Instrument Review feedback form

Professor Ping Lv	
Expert name	Ping Lv
Position	Professor
Faculty	Faculty of Economics and Management
University	Guizhou Nomal university
Email	993603559@qq.com
Comment	The overall content of the instruments is appropriate, but the following points are suggested to be adjusted. Since the survey focuses on how employees use digital technologies to achieve digital performance, the selected SMEs must be those engaged in digital transformation. Therefore, it is recommended to target technology-based SMEs for the survey. Secondly, employees are the primary subjects of the survey, and it is essential to collect information on their educational background and age.
Hereby I declare that the provided review is carried out impartially and objectively, adhering strictly to professional, scientific, and ethical standards.	Signature: LV ping Date: 8.7.2022

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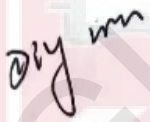
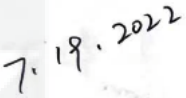
Appendix F2

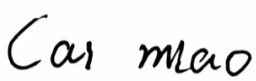
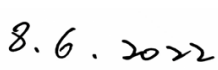
Validation Report of Panel 2

Instrument Review feedback form

Professor Min Ding	
Expert name	Min Ding
Position	Professor
Faculty	Faculty of Economics and Management
University	XiDian university
Address	
Email	344970913@qq.com
Comment	Academic achievement can be measured by several items. Is the distribution of self-administered questionnaires able to obtain accurate test scores? Considering the feasibility of data collection, it is recommended that the measurement be based on a scale for subjective scoring.
Hereby I declare that the provided review is carried out impartially and objectively, adhering strictly to professional, scientific, and ethical standards.	Signature:  Date: 

Appendix F3

Validation Report of panel 4

Professor Dr. Cai Miao	
Expert name	Cai Miao
Position	Professor
Faculty	Faculty of Economics and Management
University	Bozhou University
Address	No.2266, Tangwang Avenue, Hi-Tech Zone, Bozhou City, Anhui Province, China
Email	1553773441@qq.com
Comment	The questionnaire was overall clear. However, it would be appropriate to add a demographic variable of the student's personal information, such as gender, to the front of the scale.
Hereby I declare that the provided review is carried out impartially and objectively, adhering strictly to professional, scientific, and ethical standards.	Signature:  Date: 

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Appendix F4

Professor Dr. Gao Fang	
Expert name	Gao Fang
Position	Professor
Faculty	Faculty of International Business
University	Beijing Foreign Studies University (BFSU)
Address	No. 2/19 North Xisanhuan Road, Haidian District, Beijing, 100089, China
Email	279414793@qq.com
Comment	After the author's translation, the original translation contained some errors in both Chinese and English. After optimization and revision, these issues were corrected to ensure consistency between the English and Chinese versions, making the questionnaire clear and easy to understand.
Hereby I declare that the provided review is carried out impartially and objectively, adhering strictly to professional, scientific, and ethical standards.	Signature: Gao Fang Date: 12.12.2022

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PUSAT PEMAJUAN KOMPETENSI BAHASA
CENTRE FOR THE ADVANCEMENT OF LANGUAGE COMPETENCE (CALC)

Reference: UPM/CALC/Editing and Translation/2024
Date: 7 October 2024

To Whom It May Concern:

SUBMISSION OF DOCUMENT FOR LANGUAGE EDITING

I hereby confirm that the following document has been sent for language editing at the Centre for the Advancement of Language Competence (CALC), Universiti Putra Malaysia.

The details for the editing service provided are as follows:

Details of Client	Document Submitted
Name: Wang Guifang E-mail: gs63090@student.upm.edu.my	- PhD Thesis *Title:* **Antecedents for Employee Digital Performance in China's SMEs with Competitive Climate as Moderator and Employee Dynamic Capability as Mediator** *(Completed on 7 October 2024)*

Thank you.

"MALAYSIA MADANI"
"BERKHIDMAT UNTUK NEGARA"
"WITH KNOWLEDGE WE SERVE"

I, who uphold trust,

.....

DR. TAN WEE CHUN
Coordinator
Editing and Translation Services Unit
Centre for the Advancement of Language Competence (CALC),
Universiti Putra Malaysia

Pusat Pemajuan Kompetensi Bahasa, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor Darul Ehsan, Malaysia
603-9769 1404/ 1119 http://www.calc.upm.edu.my

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BIODATA OF STUDENT

Wang Guifang was born in Bozhou City, Anhui Province, China. In 2010, he obtained a bachelor's degree in information technology applications and management from Beijing Institute of Technology. He earned his master's degree in management science and engineering from Guizhou Normal University in 2015. After graduation, he worked at Guizhou Huizhi Electronics Co., Ltd from 2015 to 2018, serving in roles such as Assistant General Manager and Project Manager for the Guizhou Provincial Government Office, where he was involved in big data collection and analysis. From 2018 to 2021, he founded and served as the principal of Guizhou ZhiDian Education Co., Ltd. Since 2021, he has been working as a lecturer at Guizhou University of Finance and Economics.

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LIST OF PUBLICATIONS

Wang, G., Niu, Y., Mansor, Z. D., Leong, Y. C., & Yan, Z. (2024). Unlocking digital potential: Exploring the drivers of employee dynamic capability on employee digital performance in Chinese SMEs-moderation effect of competitive climate. Heliyon. DOI: 10.1016/j.heliyon. 2024.e25583.

Wang, G., Mansor, Z. D., & Leong, Y. C. 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. International Journal of Social Science Research. DOI: 10.5296/ijssr. v12i1.21774.

Wang, G., Mansor, Z. & Yee, C. L. (2024). Decoding employee digital performance: An in-depth literature analysis. Global Business Management Review, 16(1), 55-82. https://doi.org/10.32890/gbmr 2023.16.1.4.

Wang, G., Mansor, Z. D., & Leong, Y. C. (2024). 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. Journal of Innovation and Entrepreneurship, 13(1), 37. https://doi.org/10.1186/s13731-024-00395-3.

Wang, G., Mansor, Z. D., & Leong, Y. C. (2024). Linking Digital Leadership and Employee Digital Performance in SMEs in China: The Chain-Mediating Role of high-involvement Human Resource Management Practice and Employee Dynamic Capability. Heliyon. https://doi.org/10.1016/i.heliyon.2024.e36026.

Lim, P., & Wang, G. (2025) Leveraging Autonomy, Feedback, and Social Support to Enhance Work Engagement and Mitigate Turnover Intentions: Evidence from Selected Services Sector in Malaysia. http://dx.doi.org/10.6007/IJARBSS/v15-i1/24132

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