EXPLORING THE IMPACT OF DIGITALISATION CAPABILITY ON PROJECT MANAGEMENT PERFORMANCE IN SMALL AND MEDIUM-SIZED ENTERPRISES: AN EMPIRICAL ANALYSIS WITH DYNAMIC CAPABILITIES AS A MODERATING VARIABLE

Yijun Zhu[1]*, Jauriyah Shamsuddin[2], Sarah Shaharruddin[3]

[1] School of Management (College of Business), Universiti Utara Malaysia, Sintok Kedah Darul Aman, Malaysia, 06010
Email: aegenezhu@vip.sina.com
[2] School of Management (College of Business), Universiti Utara Malaysia, Sintok Kedah Darul Aman, Malaysia, 06010
Email: jauriyah@uum.edu.my
[3] School of Management (College of Business), Universiti Utara Malaysia, Sintok Kedah Darul Aman, Malaysia, 06010
Email: sarahdin@uum.edu.my

ABSTRACT: This study investigates the influence of digitalisation capability on the performance of project management within small and medium-sized enterprises (SMEs) in China, with particular attention to the moderating influence of dynamic capabilities. The research aims to clarify how the interaction between these capabilities can improve project results and strengthen overall organisational effectiveness. A quantitative methodology was adopted, employing a structured questionnaire to gather data from 251 employees representing a range of SMEs. The study applied statistical methods, including regression analysis and moderation testing, to examine the connections among digitalisation capability, project management performance, and dynamic capabilities. The analysis demonstrated a significant positive association between digitalisation capability and project management performance, suggesting that SMEs that adopt digital tools are more likely to achieve improved project outcomes. In addition, the moderating role of dynamic capabilities was confirmed, indicating that enterprises with well-developed abilities in sensing, seizing, and reconfiguring are better positioned to harness digital resources to enhance project execution. This research extends the current body of knowledge by addressing a notable gap concerning SME digital transformation. It offers empirical evidence on the interaction between digitalisation and dynamic capabilities, thereby providing practical guidance for SMEs seeking to refine their project management approaches and strengthen their position in an increasingly digitalised business environment.

Keywords: Digitalisation Capability, Project Management Performance, Dynamic Capabilities, Sensing, Seizing, Reconfiguring, SMEs.

1. Introduction

SMEs play a pivotal role in promoting economic development, innovation, and employment generation in today's rapidly evolving business landscape. With the digital revolution reshaping industries, SMEs must develop digital proficiency to remain competitive. Digitalisation capability has been defined as an enterprise's ability to deploy digital technologies, data analytics, and online communication platforms to enhance performance, customer engagement, and operational processes (Ruffoni & Reichert, 2024). In an era characterised by globalisation and shifting market expectations, SMEs are required to adopt agile and responsive approaches to project management. In recent years, scholars have increasingly focused on digital project management, recognising its relevance to organisational sustainability. Effective project planning, execution, and closure are fundamental to sustaining long-term performance (Thesing, Feldmann, & Burchardt, 2021). Project management competencies are therefore central to SMEs' ability to remain competitive, satisfy customers, and achieve strategic goals.

Despite this, many SMEs encounter difficulties in incorporating digitalisation capability due to limitations in technological expertise, financial constraints, and resistance to organisational change. As digital technologies become more embedded in business practices, it is crucial for SMEs to comprehend how digitalisation capability influences project management performance to improve operational efficiency and support growth. A growing body of literature suggests that digitalisation capability enhances communication, collaboration, and information exchange within teams, thereby strengthening project management outcomes (Ruffoni & Reichert, 2024). The use of digital tools for project coordination and collaboration facilitates real-time decision-making, reduces errors, and improves operational efficiency. Within SMEs, project managers leverage data analytics to evaluate risks, allocate resources effectively, and monitor progress (Zhang et al., 2024). Therefore, robust digital capabilities can lead to improved stakeholder satisfaction, cost efficiency, and successful project delivery. However, the strategic importance of digital skills and project management proficiency is often underestimated within SMEs, despite the evident advantages. Much of the existing research has centred on large corporations with greater access to digital transformation resources (Vilkas et al., 2024). This limited focus leaves a significant gap in understanding how SMEs can exploit digitalisation

capability to improve their project management performance. Addressing this limitation is essential for formulating effective digital transformation strategies and frameworks tailored to SMEs (Arroyabe et al., 2024).

To fully realise the benefits of digital investments and respond to evolving market needs, businesses must possess both digitalisation and dynamic capabilities. Dynamic capabilities enable organisations to identify emerging opportunities, interpret market trends, and realign resources in pursuit of strategic objectives (Dubey et al., 2023). For SMEs, success in a digitally dynamic environment depends not only on adopting new technologies but also on possessing the flexibility and foresight to adapt these tools to evolving project demands. Dynamic capabilities may also mitigate some of the challenges associated with digital transformation by enabling informed selection and implementation of project management technologies (Egwuonwu et al., 2023). Moreover, the ability to reconfigure operations allows SMEs to embed digital technologies within existing workflows and resource structures (Fang et al., 2024). Understanding how these dynamic capabilities influence the relationship between digitalisation capability and project management performance can help SMEs strengthen their project execution capacity.

Although previous studies have confirmed that digital technologies contribute positively to project outcomes, their focus has predominantly been on larger firms. For instance, research has shown that sophisticated project management software supports budget control and timely completion of tasks. Data analytics, in particular, has helped SMEs improve productivity and decision-making by enabling better resource allocation and responsiveness to market shifts. Digitalisation has also been linked to improved stakeholder engagement, enhanced team communication, and overall project success. Findings indicate that digital collaboration platforms significantly increase team participation and productivity, thus supporting more effective project execution. In complex tasks, enterprises that utilise digital technologies for knowledge sharing and information management tend to outperform competitors, highlighting the importance of cultivating a digital work culture (Heredia et al., 2022). These results reinforce the need for SMEs to invest in digitalisation capability as a means of enhancing both project management and competitiveness.

Nevertheless, notable gaps remain in the literature, particularly in relation to SMEs. Smaller firms often encounter distinct constraints that are overlooked in broader studies. While much is known about the roles of digitalisation and project management effectiveness, the influence of dynamic capabilities within SMEs remains insufficiently explored. It is still unclear how these capabilities might shape the link between digitalisation capability and project performance. Given the unique technological and financial constraints of SMEs compared to larger enterprises, there is a pressing need for empirical insights into how they can integrate digital technologies with strategic agility (Zhang et al., 2024). This study aims to address this under-researched area, examining how SMEs can leverage both digitalisation and dynamic capabilities to strengthen project management. By exploring these interrelationships, this research contributes to the academic discourse while offering practical implications for supporting SME digitalisation efforts. Addressing these disparities has the potential to advance both the performance of SMEs and the broader field of digital project management.

Dynamic capabilities have the potential to cushion the effects of digitalisation on SME project management, helping firms better select and implement digital tools and processes. This study explores the ways in which digital competencies and adaptive capabilities intersect to improve project outcomes in technology-intensive and competitive settings. The analysis highlights the importance of identifying, acquiring, and adapting dynamic capabilities within digital project management processes. Ultimately, this investigation clarifies how digitalisation capability and dynamic capabilities jointly influence project management in SMEs, supporting efforts to enhance performance in increasingly digital business environments.

The present study addresses key research gaps within the literature on SME digital transformation and project management. It investigates the specific challenges and opportunities faced by SMEs when adopting digitalisation capabilities—an area that has been largely neglected in past research (Kans & Campos, 2024). The findings are expected to provide practical guidance for enhancing digital project management practices in SMEs. As dynamic capabilities underpin organisational responsiveness and adaptability, the study offers valuable insights for SMEs, policymakers, educators, and industry professionals aiming to strengthen digital transformation outcomes through effective project management. Through this research, it becomes possible to better understand how SMEs can navigate digital change and enhance their competitive positioning.

2. Literature Review

2.1. Digitalisation Capability

Digital competencies enhance organisational operations and generate internal value by leveraging technological tools and systems. In today's highly competitive environment, the effective utilisation of data management, cloud computing, automation, and digital collaboration technologies is essential. To remain competitive, enterprises must cultivate digitalisation capability, which serves to improve operational effectiveness, strengthen customer engagement, and stimulate innovation (Chong et al., 2024). For SMEs facing resource limitations, digitalisation capability offers a means to compete on more equitable terms with larger firms. It enables these businesses to respond swiftly to market fluctuations, optimise their processes, and achieve cost efficiencies in volatile commercial environments.

Compared to mere technological adoption, digital skills provide a more sustainable and adaptable foundation for business transformation. However, as noted in a prior study, despite the strategic advantages, SMEs' digitalisation capability may be constrained by insufficient technological proficiency, limited funding, and organisational resistance to change. Research has further indicated that financial barriers and a lack of digital literacy among staff may hinder SMEs from adopting innovative digital technologies (Aristei, Gallo, & Vannoni, 2024). Acquiring digital competencies assists firms in deploying resources more efficiently and enhancing employee productivity. Scholars recommend a phased approach to digital skill development, advocating for SMEs to begin with scalable and adaptable technologies such as cloud computing, before gradually integrating advanced solutions including artificial intelligence and predictive analytics. According to a prior study, SMEs should view digitalisation capability not simply as an operational improvement, but as a transformative strategic initiative that can significantly enhance organisational effectiveness. Through structured strategic development, SMEs are better positioned to realise the full potential of their digitalisation capability, equipping them to respond effectively to evolving market demands and sustain competitive advantage.

2.2. Project Management Performance

Project management significantly influences outcomes related to time, budget, and quality. Key performance indicators (KPIs) commonly used to evaluate projects include stakeholder satisfaction, adherence to financial constraints, resource efficiency, and project duration (Baiyere et al., 2025). The Project Management Institute (PMI) underscores the importance of aligning project objectives with overarching corporate strategies to maximise value delivery. Research by Sońta-Drączkowska et al. (2025) indicates that agile and lean methodologies enhance responsiveness and operational efficiency, particularly within volatile environments. These adaptive approaches strengthen team flexibility and improve the likelihood of achieving both project-specific and broader organisational goals (Thesing et al., 2021). As such, effective project management contributes directly to the realisation of long-term strategic aims.

Digital tools are increasingly integral to project management practices, facilitating more efficient communication, progress tracking, and execution. Digital project management platforms support greater collaboration, coordination, and communication among team members, enabling adherence to timelines and budgets (Jayasuriya, Zhang, & Yang, 2024). Evidence suggests that digital technologies enhance both the efficiency and effectiveness of project execution (Baiyere et al., 2025). These technologies also promote stakeholder engagement and provide data-driven insights that allow project managers to mitigate delays and avoid cost overruns. Agile firms are particularly well-positioned to address unforeseen challenges through their use of digital project management capabilities, which proves especially beneficial in complex or resource-constrained settings (Thesing et al., 2021). The increasing complexity of project environments underscores the importance of digital technology in achieving project success and ensuring strategic alignment.

Despite these advantages, SMEs often encounter substantial barriers in executing effective project management. Limited financial and human resources may hinder their ability to implement standardised procedures, resulting in inconsistent or suboptimal project outcomes (Limniou et al., 2021). A reluctance to adopt modern tools or best practices, coupled with inadequate access to advanced project management systems, further compounds these difficulties (Fobiri, Musonda, & Muleya, 2022). Existing research supports the notion that SMEs may benefit from agile or lean project management frameworks, which offer the flexibility needed to navigate rapid market changes and improve overall performance (Ciric et al., 2021). Consequently, SMEs require tailored

project management solutions. Cultivating a project management culture that prioritises flexibility and efficiency may assist these firms in overcoming structural challenges and achieving improved outcomes (Fobiri et al., 2022). Adaptive and context-sensitive approaches are particularly vital for SMEs operating in fast-paced and uncertain environments.

2.3. Dynamic Capabilities

Firms operating in volatile markets must remain vigilant and adaptable in response to external fluctuations. The capability to sense involves identifying shifts in market demand, technological innovation, and competitive behaviour. Tools such as market research, environmental scanning, and systematic data collection support firms in anticipating potential risks. Research highlights that effective sensing requires ongoing observation of consumer trends, competitor strategies, technological developments, and the maintenance of strategic networks. Aghazadeh et al. (2024) demonstrated that organisations with strong sensing capabilities are better positioned to detect market gaps ahead of competitors, thereby facilitating innovation. This capability is especially critical for firms in rapidly evolving sectors, such as the technology industry, where timely recognition of market dynamics enables swift adaptation. Anticipating and proactively responding to change is thus integral to maintaining market leadership.

Strategic foresight and efficient allocation of organisational resources are necessary to take advantage of emerging opportunities (Vu, 2020). Effective opportunity capture requires careful prioritisation of budgets, strategic realignment, and procedural reform to maximise potential returns. Wang, Wang and Jin (2024) argue that seizing opportunities entails rapid responsiveness, optimal resource deployment, and reconfiguration of the value chain to integrate new offerings. Organisations that are adept at capitalising on opportunities often secure competitive advantages before such opportunities become widely recognised. Arroyabe et al. (2024) define this capability, referred to as grasping, as an organisation's ability to adjust its products and services to evolving customer demands and strategically exploit emerging prospects. Similarly, Chari et al. (2024) emphasise that an organisation's capacity to grasp opportunities is contingent upon its readiness to invest in innovation and supporting infrastructure, which are essential for sustainable growth and adaptability. Consequently, recognising and acting on emerging opportunities is fundamental for sustained competitiveness.

Reconfiguration, the third dynamic capability, involves modifying organisational resources, processes, and structures to align with external changes (Ostadi, Barrani, & Aghdasi, 2024). Through reconfiguration, firms can reposition operations, redeploy resources, or revise strategies to remain competitive. This process may include divesting obsolete assets, embracing advanced technologies, or streamlining workflows to enhance efficiency and responsiveness (Leemann & Kanbach, 2022). In unpredictable markets, structural transformation enables firms to maintain agility. Sońta-Drączkowska et al. (2025) suggest that reconfiguration fosters organisational agility by eliminating rigid systems. According to Fang et al. (2024), SMEs that implemented robust reconfiguration mechanisms demonstrated greater resilience during economic downturns and were capable of maintaining performance despite limited resources. Hence, adapting internal structures in response to market dynamics is vital for preserving competitive advantage.

2.4. Digitalisation Capability and Project Management Performance

Chong et al. (2024) assert that digitalisation capability enhances project management by reducing task redundancy, improving communication, and simplifying operational procedures. Tools such as data analytics, cloud computing, and digital project management systems help minimise errors and automate routine activities, thereby improving collaboration and adherence to timelines. Ellström et al. (2022) noted that digitalisation facilitates improved information exchange, enabling project teams to make timely decisions and adjust plans effectively. These technologies accelerate critical project phases, including resource distribution and schedule management. Aghazadeh et al. (2024) further highlight that firms proficient in digital technologies often outperform competitors in meeting project deadlines. The use of digital tools also improves task distribution and enhances team coordination.

Digital tools support project managers in organising and streamlining processes, while digital competencies strengthen collaboration and team communication. Tools such as video conferencing, instant messaging, and online collaboration platforms enable the seamless execution of remote projects by fostering real-time interaction (Ekanayake et al., 2024). These technologies help overcome geographical constraints, enabling teams to communicate quickly and resolve issues efficiently. Enhanced communication facilitates better decision-making, task coordination, and cohesion among project members (Ciric et al., 2021). According to Linde et al. (2021), digitalisation capability helps reduce delays, prevent miscommunication, and ensure information remains current, thereby aligning teams more closely with project objectives. Moreover, digital communication across time zones and organisational boundaries promotes more effective milestone achievement and operational performance.

Digital skills are critical for fostering communication and collaboration within project teams (Yang et al., 2024). Remote collaboration particularly relies on technologies such as video conferencing and messaging platforms. Proksch et al. (2024) observed that digital technologies enable teams to share information and solve problems without being limited by physical location. Enhanced communication supports decision-making, improves task coordination, and helps cultivate a unified project environment (Chen, Li, & Shahid, 2024). Wang et al. (2024) add that digitalisation capability eliminates lags and misinterpretations by providing up-to-date information, which improves alignment with project goals. Additionally, cross-boundary digital communication supports timely project execution and overall team performance.

Digitalisation capability also enhances responsiveness to project risks and changes. Agile management software and cloud-based platforms empower teams to accommodate evolving market conditions and shifting project requirements through iterative planning and feedback integration. Vilkas et al. (2024) found that firms with strong digital adaptability tend to achieve better outcomes. Such capabilities facilitate rapid resource reallocation and schedule adjustment without compromising quality. Baiyere et al. (2025) argue that digital technologies enhance transparency and accountability in project management by providing stakeholders with real-time updates and enabling responsive interventions. This allows project managers to modify strategies based on feedback or unforeseen issues, thereby enhancing team efficiency and project success. In this way, digitalisation capability contributes to more agile and resilient project management, ultimately strengthening overall performance.

H1: Digitalisation capability has a significant and positive impact on project management performance.

2.5. Dynamic Capabilities as a Moderator

The sensing component of dynamic capabilities plays a pivotal role in linking digital competence with project management efficiency. It enables organisations to identify and adopt project-specific digital innovations (Aghazadeh et al., 2024). By employing sensing technologies, firms can monitor consumer behaviour, technological developments, and competitive shifts, which enhances project outcomes. Aghazadeh et al. (2024) highlight that organisations possessing advanced sensing abilities are more likely to detect and apply digital solutions that effectively align with project objectives, thereby increasing the efficacy of digitalisation efforts. Early detection of project challenges through sensing allows teams to make informed, proactive adjustments to digital technologies, mitigating risks and preserving alignment with project aims (Dubey et al., 2023). Companies with strong sensing capabilities can swiftly respond to market fluctuations and evolving consumer expectations, enabling project managers to revise digital strategies for improved impact and relevance. The deployment of digital sensors that react to environmental stimuli further reinforces the relationship between digital proficiency and project effectiveness.

Dynamic capabilities also facilitate the exploitation of digital opportunities by reshaping both digitalisation and project management approaches. Digital transformation initiatives typically require reconfiguring processes, reallocating resources, and implementing rapid decision-making mechanisms. Leveraging data-driven planning improves the efficient use of resources and enhances project success. For instance, predictive analytics can be employed to identify high-priority tasks such as adjusting project timelines or allocating resources to critical deliverables (Ciric et al., 2021). In this context, a prior study illustrates how project managers can utilise insight to adapt digital tools in response to evolving requirements. This expertise enables the application of tailored digital technologies, thereby advancing project performance. Structural, procedural, and resource modifications are essential for aligning digital capabilities with project success, necessitating continuous project reconfiguration (Fobiri et al., 2022). This adaptive process allows organisations to modify digital tools and workflows in accordance with shifting demands. As prior studies observe, firms with strong reconfiguration capabilities are better equipped to eliminate inflexible systems and foster adaptive environments conducive to innovation.

The adoption of innovative digital strategies can significantly enhance the likelihood of project success. Digital flexibility contributes to the achievement of long-term objectives while reducing the risk of obsolescence.

Realigning digital resources in accordance with project priorities strengthens performance, responsiveness, and agility. Effective project management is supported by the ability to sense, track, and modify digital technologies to match evolving project needs. These dynamic capabilities empower firms to identify opportunities, direct resources toward digital initiatives, and restructure operations to maintain project viability in uncertain environments (Aristei et al., 2024). According to Baden-Fuller and Teece (2020), organisations possessing all three dynamic capabilities—sensing, seizing, and reconfiguring—can optimise digital resources to meet specific project demands, thereby enhancing outcomes. As noted by Ciric et al. (2021), dynamic capabilities ensure that enterprises can anticipate project needs and achieve successful integration of digital technologies throughout the entire project lifecycle. In this regard, digitalisation capability underpinned by dynamic competencies is vital for enhanced organisational performance and project success.

H2: Dynamic capabilities moderate the relationship between Digitalisation capability and project management performance.

2.6. Theoretical Background

The Dynamic Capabilities Theory (DCT), introduced in prior studies determines a comprehensive foundation for assessing capabilities in both project management and digitalisation contexts. This theory emphasises that organisations adapt successfully by identifying, acquiring, and reshaping their capabilities. Such dynamic abilities empower firms to detect emerging opportunities and challenges, seize potential advantages, and realign internal resources to sustain competitive advantage. For SMEs operating in fast-moving and resource-restricted environments, agility and adaptability are crucial for success (Baden-Fuller & Teece, 2020). Technologies such as automation, collaborative platforms, and data analytics enhance project managers' ability to optimise processes, make informed decisions, and elevate performance levels. However, these digital competencies yield benefits only when organisations can flexibly adjust them to evolving project requirements and external factors. Dynamic capabilities facilitate firms in recognising trends early, exploiting opportunities effectively, and restructuring resources to tackle unforeseen issues, thereby increasing the effectiveness of digital technologies (Aristei et al., 2024).

Sensing capabilities enable project teams to remain alert to digital innovations and to evaluate whether shifts in project scope or market demands call for new digital solutions (Aghazadeh et al., 2024). This responsiveness allows businesses to tailor digital applications to meet changing project needs, ultimately supporting project success. By leveraging such capabilities, organisations can allocate resources strategically to digital initiatives that enhance both project value and management outcomes. Project teams gain the ability to prioritise activities, allocate resources swiftly, and make real-time decisions using insights provided by digital tools. This adaptability enables managers to modify digital resources in response to shifting deadlines and evolving data, optimising utilisation, improving communication, and supporting effective decision-making—key competencies within project management.

Reconfiguration capabilities play a vital role in enabling teams to realign resources and organisational structures to fit new objectives (Wang et al., 2024). Digital technologies can be flexibly adjusted to maintain performance across variations in project scope or focus. Particularly for SMEs with limited resources, the ability to modify digital assets in real time is essential (Aristei et al., 2024). The capacity to reorganise and adapt capabilities according to contemporary project demands fosters greater agility and responsiveness, thereby strengthening the link between digital competence and positive project outcomes. Informed by the literature and preceding discussion, the conceptual framework depicted in Figure 1 has been developed.

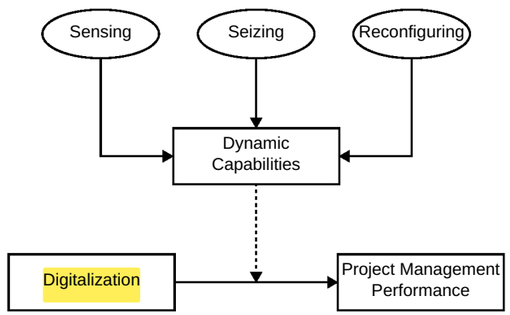


Figure 1: Conceptual Framework.

3. Methodology

3.1. Research Design

Quantitative research methods were employed to assess the influence of digitalisation capability on project management performance among Chinese SMEs. The study involved systematic data collection and the application of statistical hypothesis testing to analyse the relationships (Cui, Huang, & Yan, 2024). This approach enables the quantification of digitalisation, dynamic capabilities, and project management competencies. A cross-sectional design was utilised to investigate the digitalisation capabilities and project performance strategies of SMEs. The findings revealed variable associations, particularly when external project management factors were considered (Wasilkiewicz Edwin, Kongsvik, & Albrechtsen, 2024). The use of quantitative techniques enhanced the generalisability of the results to a wider population of Chinese SMEs and contributed to a more comprehensive understanding of digital transformation processes within these organisations.

3.2. Population

This study focused on Chinese SMEs, which constitute a significant portion of China's GDP and employment. These enterprises account for more than 90% of all firms and provide jobs for over 70% of the workforce. The employees' direct interaction with digital technologies was considered crucial in influencing project management outcomes. The sample was selected to specifically investigate the role of digitalisation capability in supporting project management within this sector. Employees were identified as primary respondents due to their ability to evaluate both the digitalisation capabilities and project management practices within their organisations (Faizi & Alvi, 2023). This demographic was deemed appropriate as it reflected diverse perspectives and experiences across SMEs. The results are expected to offer insights into the impact of digitalisation capability on project management performance in Chinese SMEs.

3.3. Sample Size Determination and Sampling Technique

To ensure the reliability and statistical validity of the study, a sample of 251 employees was selected. The sample size was determined using Cochran's proportional population formula, which considers the desired confidence level and response variability. Specifically, 251 responses were required to achieve a 95% confidence level with a 5% margin of error. This sample size was sufficient to enable robust statistical analysis of the relationship between digitalisation capability and project management performance in SMEs. Respondents were chosen through a stratified sampling method, where the SME population was divided according to three criteria: industrial sector, firm size, and geographic location. Within each stratum, participants were recruited via professional networks, industry associations, and social media platforms frequently used by SME employees. Although the sampling was not purely random, this approach sought to maximise coverage and representativeness across different industries and organisational contexts (Baiyere et al., 2025). In total, 300 questionnaires were distributed, with 251 valid responses obtained, resulting in an 83.7% response rate. This stratified yet pragmatic sampling strategy helped minimise selection bias and improved the generalisability of the findings to the broader population of Chinese SMEs.

3.4. Data Collection Technique

This study gathered quantitative data on the impact of digitalisation capability on project management performance within Chinese SMEs through a structured questionnaire. The instrument measured constructs related to project management, dynamic capabilities, and digital competencies. Employing a systematic design enhanced the comprehensiveness of the analysis and ensured coverage of all pertinent dimensions. Questionnaire items were adapted from established literature scales to accurately reflect theoretical constructs, thereby enhancing both reliability and validity. An initial pilot test was conducted with personnel from several SMEs to identify any issues related to clarity and comprehension. Subsequently, the questionnaire was refined based on the feedback to improve respondent understanding. The final survey was administered online to employees of SMEs. Online distribution facilitated efficient and rapid data collection, permitting respondents to complete the questionnaire at their convenience while enabling broader geographic reach (Aravindhan et al., 2023). The survey link was shared across professional networks, industry associations, and social media platforms focused on SMEs to secure representation across various sectors. The resulting dataset, comprising 251 completed questionnaires, was sufficiently large to allow statistically meaningful analysis and to generalise findings to the Chinese SME population. The targeted sample size of 251 responses was intended to provide robust statistical evidence on how digitalisation capability influences project management performance.

3.5. Data Analysis Technique

SPSS is a robust statistical tool for quantitative social science research (Faizi & Alvi, 2023). It was selected for handling large survey datasets due to its user-friendly interface and advanced analytics. The software assessed relationships between digitalisation capability, dynamic capability, and project management

performance. Descriptive statistics were first used to summarise respondent demographics and survey responses, aiding sample understanding and diversity assessment. Measures such as mean, median, and standard deviation were employed. Inferential analyses, including regression, tested hypotheses and examined direct and moderating effects of digitalisation and dynamic capabilities on project management (Cui et al., 2024). Correlation analysis further highlighted the impact of digital capabilities on performance. SPSS enabled thorough analysis aligned with study objectives, enhancing result reliability and validity.

4. Results

The demographic profile of the respondents offers insights into the workforce of Chinese SMEs. As shown in Table 1, 65% were male and 35% female. Most participants (45%) were aged 25–34, followed by 29.9% aged 35–44 and 15.1% aged 18–24, suggesting a predominantly young workforce receptive to digital innovation. Half held bachelor's degrees and 30% master's degrees, indicating a well-educated sample with likely proficiency in project management and digital skills. Regarding experience, 40% had 3–5 years, reflecting both practical knowledge and fresh perspectives. Industry-wise, 40% worked in information technology and services, 30% in manufacturing, and 20% in retail. This diversity highlights the study's applicability across various digital business settings.

Table 1: Demographic Profile of Respondents.

Demographic Variable	Frequency	Percentage (%)
Age		
18-24	38	15.1
25-34	113	45.0
35-44	75	29.9
45 and Above	25	10.0
Gender		
Male	163	65
Female	88	35
Position		
Employee	90	35.9
Manager	100	39.8
Executive	61	24.3

Table 2 presents the descriptive statistics for the key variables—digitalisation capability, project management, and dynamic capabilities—among Chinese SME employees. Digitalisation capability recorded a mean of 4.12 (SD = 0.78), indicating a generally positive perception of digital tools and resources. This high mean suggests that digital platforms and technologies are integral to respondents' daily operations. Project management scored a mean of 4.05 (SD = 0.82), reflecting agreement on its role in achieving cost efficiency and stakeholder satisfaction. Dynamic capabilities had a mean of 3.95 (SD = 0.85), emphasising the importance of sensing, seizing, and reconfiguring in dynamic market environments. Ratings ranged from 2.50 to 5.00, indicating varied experiences and perceptions. While most respondents recognised the value of digitalisation and dynamic capabilities, a small subset appeared less engaged. Overall, the statistics confirm a strong organisational orientation towards digital transformation and effective project management, supporting further investigation into their impacts.

Table 2: Descriptive Statistics.

Variable	Mean	Standard Deviation
Digitalisation Capability	4.12	0.78
Project Management Performance	4.05	0.82
Dynamic Capabilities	3.95	0.85

The normality of the data was assessed through the examination of skewness and kurtosis values for digitalisation capability, project management performance, and dynamic capabilities, as summarised in Table 3. All variables exhibited skewness coefficients within the range of -1 to +1, indicating a relatively symmetrical distribution of responses. Confirming normality is fundamental for the application of many statistical procedures. The skewness value for digitalisation capability was -0.23, which denotes a slight left skew, reflecting a general tendency among respondents to rate these capabilities favourably. Similarly, project management performance and dynamic capabilities showed skewness values of -0.18 and -0.15 respectively, further suggesting a predominance of positive feedback from participants. Kurtosis values, which describe the extent of peakedness or flatness in the distribution, remained within the acceptable bounds of -2 to +2. Specifically, the kurtosis statistics for digitalisation capability, project management performance, and dynamic capabilities were -0.54, -0.48, and -0.32 respectively, indicating relatively even distributions without pronounced peaks or heavy tails. These results collectively confirm that the dataset approximates a normal distribution, thereby validating the use of parametric analytical methods to explore the relationships between digitalisation capability, dynamic capabilities, and project management performance in SMEs.

Table 3: Normality Assessment.

Variable	Skewness	Kurtosis
Digitalisation Capability	-0.23	-0.54
Project Management Performance	-0.18	-0.48
Dynamic Capabilities	-0.15	-0.32

Table 4 presents the correlation analysis among digitalisation capability, project management performance, and dynamic capabilities in Chinese SMEs. Strong positive correlations were observed between all variables. Digitalisation capability showed a strong correlation with project management performance ($r = 0.65$), suggesting that enhanced digital tools and resources contribute to more effective project execution. A correlation of 0.58 between dynamic capabilities and project management performance indicates that firms adept at sensing, seizing, and reconfiguring are more likely to succeed. Additionally, the correlation between digitalisation capability and dynamic capabilities was 0.54, implying that digital resources support the development of dynamic competencies. All correlations were statistically significant ($p < 0.001$), underscoring the interconnected nature of these constructs. The findings support the hypotheses that digitalisation capability enhances project performance and that dynamic capabilities play a moderating role, providing a solid foundation for further analysis of their direct and interactive effects.

Table 4: Correlation Analysis

Variable	DC	PMP	Dynamic Capabilities
Digitalisation Capability	1.00	0.65**	0.54**
Project Management Performance	0.65**	1.00	0.58**
Dynamic Capabilities	0.54**	0.58**	1.00
Note: $p < 0.001$ indicates significant correlations.			

Table 5 reports the outcomes of the reliability analysis conducted on the measurement constructs: digitalisation capability (7 items), project management performance (8 items), and dynamic capabilities (12 items). All constructs exhibited high internal consistency, with Cronbach's Alpha ranging from 0.87 to 0.92 and composite reliability between 0.90 and 0.93. Moreover, the Average Variance Extracted (AVE) values, spanning from 0.63 to 0.70, surpassed the recommended 0.50 threshold, thereby confirming convergent validity. These psychometric results meet established benchmarks, affirming the reliability and validity of the measurement model. Accordingly, the constructs are deemed suitable for subsequent structural analysis examining the interrelations among digitalisation capability, dynamic capabilities, and project management performance within organisational settings.

Table 5: Reliability Analysis.

Variable	Number of Items	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Digitalisation Capability	7	0.89	0.91	0.66
Project Management Performance	8	0.87	0.90	0.63
Dynamic Capabilities	12	0.92	0.93	0.70
Note: All values indicate good reliability, as Cronbach's Alpha values above 0.70 are considered acceptable, while values above 0.90 indicate excellent reliability.				

Table 6 presents the external loadings for the constructs under investigation, including digitalisation capability, project management performance, and dynamic capabilities. Outer loadings represent the relationships between observable indicators (items) and their underlying latent variables, thereby indicating the extent to which each item contributes to its respective construct. Within this study, the statement "We can use various software and digital applications to support our business activities" exhibited the highest loading of 0.88, underscoring its significant role in measuring digitalisation capability. The outer loadings for digitalisation capability ranged from 0.74 to 0.88, demonstrating the strong predictive validity of these items for the construct. Similarly, project management performance indicators showed outer loadings between 0.70 and 0.85, with the item "After the project is completed, all parties are satisfied with the project delivery results" achieving a loading of 0.85, which highlights its critical contribution to capturing the construct of project performance outcomes. For dynamic capabilities, outer loadings varied from 0.70

to 0.82, with the highest loading of 0.82 associated with the item “We use established processes to identify target market segments,” emphasising its importance in representing the firm’s capacity to detect market changes. The predominance of outer loadings exceeding the threshold of 0.70 indicates that the observed variables are reliable indicators of their respective constructs. These results provide evidence of convergent validity for the constructs and confirm the reliability of the measurement instrument used in this study. Consequently, the outer loading findings substantiate the appropriateness of the questionnaire items and reinforce the validity of the study’s conclusions regarding digitalisation capability, dynamic capabilities, and project management performance in Chinese SMEs.

Table 6: Outer Loadings.

Variable	Item Description	Outer Loading
Digitalisation Capability	Digital devices used to support business activities.	0.76
	Various software and digital applications used.	0.88
	Ability to use data or information from the Internet.	0.79
	Use of digital platforms for business activities.	0.81
	Use of e-commerce platforms to maximize sales.	0.74
	Ability to create and develop websites or platforms.	0.78
	Ability to update websites or platforms.	0.77
Project Management Performance	Achievement of cost targets after project completion.	0.85
	Achievement of capital value targets.	0.81
	Timely decision-making in project implementation.	0.83
	Harmonious relationships during project implementation.	0.80
	Achievement of safety and environmental protection targets.	0.79
	Correctness of important decisions in project implementation.	0.84
	Satisfaction of all parties with project delivery results.	0.85
	Positive feedback received from the public (or users).	0.77
Dynamic Capabilities	Participation in professional association activities.	0.70
	Established processes for identifying market segments.	0.82
	Observation of best practices in the sector.	0.78
	Gathering economic information on operations.	0.74
	Investment in finding solutions for customers.	0.80
	Adoption of best practices in the sector.	0.76
	Responsiveness to defects pointed out by employees.	0.79
	Changes in practices based on customer feedback.	0.81
	Implementation of new management methods.	0.73
	New or changed marketing methods.	0.77
	Renewal of business processes.	0.81
	Changed ways of achieving targets and objectives.	0.79
Note: Outer loadings above 0.70 indicate good item reliability and validity.		

Table 7 reports an R-squared value of 0.65 for project management performance, indicating that digitalisation and dynamic capabilities jointly account for 65% of the variance in project outcomes. This substantial explanatory power underscores the model’s predictive strength and affirms the critical role of digital tools and dynamic competencies in enhancing project success within Chinese SMEs. The R-squared value suggests that firms equipped with robust digital infrastructures and adaptive capabilities are more likely to achieve project goals, such as stakeholder satisfaction, cost control, and timely decision-making. This finding aligns with prior research advocating the integration of digitalisation and dynamic capabilities to strengthen project execution. It highlights that SMEs fostering environments conducive to sensing, seizing, and reconfiguring resources are better positioned for project success. The strong R-squared value not only reinforces the theoretical foundations of the study but also offers practical guidance for SMEs aiming to elevate project management performance through strategic digital transformation and capability development. In this context, R-squared serves as a reliable metric reflecting both the model’s explanatory capacity and the interdependence of key variables.

Table 7: R-Squared Values.

Variable	R-Squared Value
Project Management Performance	0.65

Table 8 presents the regression results for Hypothesis 1 (H1), which tested the anticipated relationship between digitalisation capability and project management performance. The analysis revealed a significant positive association, with a standardised regression coefficient (β) of 0.65, indicating that enhanced digitalisation capability substantially contributes to improved project management within Chinese SMEs. The corresponding t-value of 8.54 far exceeds the critical threshold of 1.96 for significance at the 0.05 level, confirming that the relationship is statistically robust and unlikely to be due to chance. Moreover, the p-value of 0.000 further substantiates the result’s significance, strongly justifying the rejection of the null hypothesis. These findings affirm that firms leveraging digital tools, technologies, and platforms are more likely to achieve project success. The results align with existing literature emphasising the role of digital transformation in driving operational efficiency and strategic project outcomes. Overall, the evidence highlights the strategic importance of digitalisation capability as a key determinant of project management effectiveness in SME contexts.

Table 8: Regression Analysis.

Hypothesis		Beta Coefficient (β)	T-Value	P-Value
H1	Digitalisation Capability → Project Management Performance	0.65	8.54	0.000

The moderation analysis explored Hypothesis 2 (H2), which investigated whether dynamic capabilities moderate the relationship between digitalisation capability and project management performance. As presented in Table 9, the findings indicate a significant moderating effect, with a standardised beta coefficient (β) of 0.19. This positive interaction suggests that firms possessing strong dynamic capabilities are better positioned to leverage digital technologies to enhance project outcomes. The statistical significance of the moderating effect is supported by a t-value of 3.37, exceeding the critical threshold of 1.96, and a p-value of 0.002, which is well below the 0.05 significance level. These results substantiate the hypothesis that dynamic capabilities amplify the impact of digitalisation on project management performance. The findings reinforce the theoretical proposition that digitalisation and dynamic capabilities are mutually reinforcing, and that their integration is essential for achieving project success. By enabling firms to sense, seize, and reconfigure resources in response to environmental shifts, dynamic capabilities serve as a catalyst for the effective implementation of digital strategies. This moderating effect not only enriches our understanding of how these constructs interact but also aligns with prior literature emphasising the multidimensional nature of organisational success.

Table 9: Moderation Analysis.

Hypothesis		Beta Coefficient (β)	T-Value	P-Value
H2	Digitalisation Capability × Dynamic Capabilities → Project Management Performance	0.19	3.37	0.002**

5. Discussion

Empirical evidence reinforces the assertion that digital competencies significantly enhance project management performance within Chinese SMEs. The present findings confirm that digitalisation capabilities positively influence project outcomes, aligning with prior research which posits that digital technologies enhance decision-making processes, stakeholder engagement, and overall organisational efficiency (Zhang et al., 2024). Digital skills encompass a broad spectrum, including data analytics, project planning, and collaboration platforms, all of which facilitate seamless communication and coordination within project teams. The adoption of such tools contributes to improved customer satisfaction, adherence to project timelines, and more effective resource utilisation. Furthermore, the findings underscore that digitalisation enhances stakeholder involvement, budgetary compliance, and timely project delivery. As Vu (2020) notes, data analytics empower project managers to monitor performance, anticipate challenges, and make informed decisions to mitigate risks. Digital-savvy SMEs consistently demonstrate higher levels of operational efficiency and project success, suggesting

that digital transformation equips them to navigate increasingly agile and dynamic project environments.

The study also substantiates Hypothesis 2, which posits that dynamic capabilities moderate the relationship between digitalisation capability and project management performance. Dynamic capabilities—particularly the abilities to sense emerging trends, seize opportunities, and reconfigure resources—are critical for optimising digital investments. The results indicate that SMEs with strong dynamic capabilities are more adept at leveraging digital tools to improve project outcomes. This finding supports the work of Hagen et al. (2024), who argue that firms with advanced dynamic capabilities are better positioned to capitalise on opportunities and adapt to environmental shifts. Sensing capabilities, in particular, enable SMEs to identify and evaluate digital trends that can enhance project performance. According to Fang et al. (2024), firms that actively track industry developments and engage stakeholders tend to implement digital solutions more effectively. Given resource constraints often faced by SMEs, the strategic prioritisation of tailored digital solutions becomes essential for maintaining competitiveness.

Moreover, the study highlights the critical moderating role of dynamic capabilities in the digitalisation–project management nexus. SMEs that possessed a clearer understanding of their digital potential demonstrated superior project performance. This finding echoes Matarazzo et al. (2021), who found that organisations with strategic clarity were more likely to support digital initiatives aligned with long-term objectives. The research further reveals that SMEs were compelled to rapidly allocate resources and adjust organisational processes to facilitate the integration of digital technologies. Firms exhibiting high reconfiguration capabilities were more capable of realigning internal structures and workflows, thereby enhancing project delivery. This observation aligns with Liang et al. (2024), who advocate for organisational restructuring to maximise digital investment returns. Through real-time data utilisation and adaptive feedback loops, SMEs were able to accelerate internal processes, enhance collaboration, and improve overall project success.

Collectively, the statistical findings underscore the critical influence of both digitalisation and dynamic capabilities on SME project management. The synergistic effect of these capabilities is particularly salient in contemporary business environments characterised by rapid technological change and evolving market demands. As Slavković et al. (2023) suggest, the ability to dynamically adapt digital strategies confers a competitive advantage and enables firms to remain responsive and resilient. Despite facing challenges such as limited resources, technical expertise, and digital maturity, SMEs that possess unique digital and dynamic capabilities can still enhance project outcomes. Consistent with Zhang et al. (2024), the present study concludes that digitalisation competencies directly contribute to operational efficiency and project success. In turn, dynamic capabilities function as regulatory mechanisms that shape the trajectory of digital transformation, enabling firms to proactively identify risks and opportunities. These findings underscore the importance of strategic investments in digital skills and adaptive capacity as a means of strengthening SMEs' competitiveness and project management effectiveness in volatile environments.

6. Conclusion

This study demonstrates that Digitalisation capabilities, particularly dynamic capabilities, significantly influence project management performance in Chinese SMEs. A growing body of literature underscores the transformative potential of digital technologies to enhance organizational efficiency and effectiveness, with Digitalisation capability playing a pivotal role in advancing project management outcomes. Tools such as communication platforms, project management software, and data analytics enable SMEs to optimize operations, improve resource allocation, and increase the likelihood of project success. The findings reveal that Digitalisation capabilities contribute positively to improved project delivery timelines, budget adherence, and stakeholder satisfaction, thereby highlighting the critical role of digital transformation in contemporary business contexts. Furthermore, the study identifies dynamic capabilities as a vital mechanism linking Digitalisation capability to project management performance. SMEs equipped with the ability to sense emerging opportunities, seize them effectively, and reconfigure resources accordingly are better positioned to maximize their digital investments and enhance project outcomes. In today's fast-evolving project management landscape, the integration of Digitalisation and dynamic capabilities is indispensable. The ability to realign internal processes in real time, capitalize on new digital trends, and respond adaptively to shifting market conditions enables SMEs to meet complex project demands effectively. Ultimately, in an increasingly digitalized economy, the synergy between Digitalisation and dynamic capabilities not only fosters superior project management performance but also confers a sustainable competitive advantage to SMEs.

7. Implications

7.1. Practical Implications

SMEs engaged in digital transformation should apply the insights from this study to enhance their project management practices. Given their resource constraints, SMEs particularly require robust digitalisation capabilities. Utilising digital tools is essential for improving project management efficiency within these organisations. Investment in project management systems, data analytics, and collaboration platforms can significantly advance teamwork and operational processes. Such initiatives are likely to lead to improved operational efficiency, superior project outcomes, and greater adherence to budgetary and scheduling requirements. Moreover, employee training and professional development are critical for strengthening digital competencies. SMEs must acknowledge that mere adoption of digital technologies is insufficient without appropriate workforce training. Enhancing digital literacy and familiarity with project management software among project teams can foster innovation and develop requisite skills. An in-depth understanding of digital technologies is vital for SMEs to effectively manage project complexities and achieve desired performance outcomes. The relationship between digitalisation capability and project management performance is mediated by dynamic capabilities, necessitating SMEs to develop sensing, seizing, and reconfiguration skills to optimise digital technology utilisation. Continuous monitoring of market conditions and gathering feedback enable SMEs to identify emerging project-related trends and opportunities. By staying attuned to digital advancements, SMEs can restructure resources and processes in alignment with project requirements, thereby improving overall project performance.

7.2. Theoretical Implications

This study contributes to the digital transformation and project management literature by empirically linking project management performance with digitalisation capability. It advances understanding of how digital technologies can enhance SME operational efficiency, providing a foundation for future research. The findings highlight the benefits of digitalisation capability and underscore its critical role in SMEs' success within today's dynamic business environment. Theoretically, the study explicates the role of dynamic capabilities in project management performance, demonstrating that such capabilities enhance digital investments and support digital transformation. The results suggest that further academic inquiry is needed into the interplay between digitalisation and dynamic capabilities across diverse organisational contexts, enabling firms to adapt and flourish amid rapid change. This study also indicates that the effectiveness of project management, digitalisation, and dynamic capabilities may differ by organisation and region. Future research should explore how SMEs deploy digital technologies and develop dynamic capabilities within industry-specific frameworks. Additionally, external partnerships—particularly with technology providers—could offer novel opportunities for SMEs to strengthen their digital and dynamic capacities. By deepening insights into project management processes, scholars can better support SMEs in achieving competitive advantage in increasingly challenging markets.

8. Limitations and Future Direction

This study demonstrates how digitalisation and dynamic capabilities enhance project management in SMEs, despite inherent limitations. Its focus on China restricts generalisability to other cultural or economic contexts, where technical infrastructure, regulations, and organisational cultures differ. A comparative approach across diverse regions could deepen understanding of how these capabilities influence project management success globally. Relying on questionnaire data presents potential biases such as self-selection and social desirability, with participants possibly overstating their skills. Future research should adopt mixed-methods, incorporating qualitative insights from interviews or case studies to capture the lived experiences of project managers and teams. While this study highlights dynamic capabilities like sensing, seizing, and reconfiguring, further investigation into other dynamic project management skills is warranted. Exploring the roles of corporate culture, leadership, and knowledge management in digital tool adoption may yield valuable insights. Strengthening the theoretical link between digitalisation and dynamic capabilities could better guide SME project management.

References

Aghazadeh, H., Zandi, F., Amoozad Mahdiraji, H., & Sadraei, R. (2024). Digital transformation and SME internationalisation: unravelling the moderated-mediation role of digital capabilities, digital resilience and digital maturity. *Journal of Enterprise Information Management, 37*(5), 1499-1526. https://doi.org/10.1108/JEIM-02-2023-0092

Aravindhan, C., Santhoshkumar, R., Bonny, K., Vidhya, K., Manishankar, S., & Dhamodharam, P. (2023). Delay analysis in construction project using Primavera & SPSS. *Materials Today: Proceedings, 80*, 3171-3177. https://doi.org/10.1016/j.matpr.2021.07.186

Aristei, D., Gallo, M., & Vannoni, V. (2024). Preferences for ethical intermediaries and sustainable investment decisions in micro-firms: The role of financial literacy and digital financial capability. *Research in International Business and Finance, 71*, 102483. https://doi.org/10.1016/j.ribaf.2024.102483

Arroyabe, M. F., Arranz, C. F. A., Fernandez De Arroyabe, I., & Fernandez de Arroyabe, J. C. (2024). Analyzing AI adoption in European SMEs: A study of digital capabilities, innovation, and external environment. *Technology in Society, 79*, 102733. https://doi.org/10.1016/j.techsoc.2024.102733

Baden-Fuller, C., & Teece, D. J. (2020). Market sensing, dynamic capability, and competitive dynamics. *Industrial Marketing Management, 89*, 105-106. https://doi.org/10.1016/j.indmarman.2019.11.008

Baiyere, A., Salmela, H., Nieminen, H., & Kankainen, T. (2025). Assessing digital capabilities for digital transformation—The MIND framework. *Information Systems Journal, 35*(1), 6-38. https://doi.org/10.1111/isj.12519

Chari, A., Despeisse, M., Johansson, B., Morioka, S., Gohr, C. F., & Stahre, J. (2024). Resilience compass navigation through manufacturing organization uncertainty – A dynamic capabilities approach using mixed methods. *CIRP Journal of Manufacturing Science and Technology, 55*, 375-389. https://doi.org/10.1016/j.cirpj.2024.10.014

Chen, A., Li, L., & Shahid, W. (2024). Digital transformation as the driving force for sustainable business performance: A moderated mediation model of market-driven business model innovation and digital leadership capabilities. *Heliyon, 10*(8), e29509. https://doi.org/10.1016/j.heliyon.2024.e29509

Chong, Y., Zhang, Y., Di, D., Chen, Y., & Wang, S. (2024). Digital transformation and synergistic reduction in pollution and carbon Emissions——An analysis from a dynamic capability perspective. *Environmental Research, 261*, 119683. https://doi.org/10.1016/j.envres.2024.119683

Ciric, D., Delic, M., Lalic, B., Gracanin, D., & Lolic, T. (2021). Exploring the Link Between Project Management Approach and Project Success Dimensions: A Structural Model Approach. *Advances in Production Engineering & Management, 16*(1), 99-111. https://doi.org/10.14743/apem2021.1.387

Cui, H., Huang, J., & Yan, Y. (2024). A Sentiment-driven SPSS Requirement Analysis Method Based on Online Reviews. *Procedia CIRP, 128*, 834-839. https://doi.org/10.1016/j.procir.2024.07.066

Dubey, R., Bryde, D. J., Dwivedi, Y. K., Graham, G., Foropon, C., & Papadopoulos, T. (2023). Dynamic digital capabilities and supply chain resilience: The role of government effectiveness. *International Journal of Production Economics, 258*, 108790. https://doi.org/10.1016/j.ijpe.2023.108790

Egwuonwu, A., Mendy, J., Smart-Oruh, E., & Egwuonwu, A. (2023). Drivers of Big Data Analytics' Adoption and Implications of Management Decision-Making on Big Data Adoption and Firms' Financial and Nonfinancial Performance: Evidence From Nigeria's Manufacturing and Service Industries. *IEEE Transactions on Engineering Management, 71*, 11907-11922. https://doi.org/10.1109/TEM.2023.3321426

Ekanayake, B., Wong, J. K. W., Fini, A. A. F., Smith, P., & Thengane, V. (2024). Deep learning-based computer vision in project management: Automating indoor construction progress monitoring. *Project Leadership and Society, 5*, 100149. https://doi.org/10.1016/j.plas.2024.100149

Ellström, D., Holtström, J., Berg, E., & Josefsson, C. (2022). Dynamic capabilities for digital transformation. *Journal of Strategy and Management, 15*(2), 272-286. https://doi.org/10.1108/JSMA-04-2021-0089

Faizi, N., & Alvi, Y. (2023). Regression and multivariable analysis. In N. Faizi & Y. Alvi (Eds.), *Biostatistics Manual for Health Research* (pp. 213-247). Academic Press. https://doi.org/10.1016/B978-0-443-18550-2.00011-6

Fang, T. M., Ahmad, N. H., Halim, H. A., Iqbal, Q., & Ramayah, T. (2024). Pathway towards SME competitiveness: Digital capability and digital business model innovation. *Technology in Society, 79*, 102728. https://doi.org/10.1016/j.techsoc.2024.102728

Fobiri, G., Musonda, I., & Muleya, F. (2022). Reality Capture in Construction Project Management: A Review of Opportunities and Challenges. *Buildings, 12*(9), 1381. https://doi.org/10.3390/buildings12091381

Hagen, B., Tarantino, B., Liesch, P. W., Zucchella, A., & Weerawardena, J. (2024). Context-dependence of dynamic capabilities in small, entrepreneurial firm internationalization. *International Business Review, 33*(5), 102304. https://doi.org/10.1016/j.ibusrev.2024.102304

Jayasuriya, S., Zhang, G., & Yang, R. J. (2024). Towards successful economic infrastructure partnership project delivery through effective stakeholder management. *Transportation Research Interdisciplinary Perspectives, 26*, 101173. https://doi.org/10.1016/j.trip.2024.101173

Kans, M., & Campos, J. (2024). Digital capabilities driving industry 4.0 and 5.0 transformation: Insights from an interview study in the maintenance domain. *Journal of Open Innovation: Technology, Market, and Complexity, 10*(4), 100384. https://doi.org/10.1016/j.joitmc.2024.100384

Leemann, N., & Kanbach, D. K. (2022). Toward a taxonomy of dynamic capabilities – a systematic literature review. *Management Research Review, 45*(4), 486-501. https://doi.org/10.1108/MRR-01-2021-0066

Liang, L., Chen, S., Wu, D., & Wu, X. (2024). How established firms build digital capabilities for business model innovation: An exploratory case study. *Journal of Engineering and Technology Management, 72*, 101819. https://doi.org/10.1016/j.jengtecman.2024.101819

Limniou, M., Varga-Atkins, T., Hands, C., & Elshamaa, M. (2021). Learning, Student Digital Capabilities and Academic Performance over the COVID-19 Pandemic. *Education Sciences, 11*(7), 361. https://doi.org/10.3390/educsci11070361

Linde, L., Sjödin, D., Parida, V., & Wincent, J. (2021). Dynamic capabilities for ecosystem orchestration A capability-based framework for smart city innovation initiatives. *Technological Forecasting and Social Change, 166*, 120614. https://doi.org/10.1016/j.techfore.2021.120614

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

Ostadi, B., Barrani, L., & Aghdasi, M. (2024). Developing a strategic roadmap towards integration in Industry 4.0: A dynamic capabilities theory perspective. *Technological Forecasting and Social Change, 208*, 123679. https://doi.org/10.1016/j.techfore.2024.123679

Proksch, D., Rosin, A. F., Stubner, S., & Pinkwart, A. (2024). The influence of a digital strategy on the digitalization of new ventures: The mediating effect of digital capabilities and a digital culture. *Journal of Small Business Management, 62*(1), 1-29. https://doi.org/10.1080/00472778.2021.1883036

Ruffoni, E. P., & Reichert, F. M. (2024). Exploring configurations of digital servitization capabilities for value creation: An fsQCA approach. *Industrial Marketing Management, 122*, 131-144. https://doi.org/10.1016/j.indmarman.2024.08.010

Slavković, M., Pavlović, K., Mamula Nikolić, T., Vučenović, T., & Bugarčić, M. (2023). Impact of Digital Capabilities on Digital Transformation: The Mediating Role of Digital Citizenship. *Systems, 11*(4), 172. https://doi.org/10.3390/systems11040172

Sońta-Drączkowska, E., Cichosz, M., Klimas, P., & Pilewicz, T. (2025). Co-creating innovations with users: A systematic literature review and future research agenda for project management. *European Management Journal, 43*(2), 321-339. https://doi.org/10.1016/j.emj.2024.07.001

Thesing, T., Feldmann, C., & Burchardt, M. (2021). Agile versus Waterfall Project Management: Decision Model for Selecting the Appropriate Approach to a Project. *Procedia Computer Science, 181*, 746-756. https://doi.org/10.1016/j.procs.2021.01.227

Vilkas, M., Stefanini, A., Ghobakhloo, M., & Grybauskas, A. (2024). Digital technology-enabled capability development pathways. *Computers & Industrial Engineering, 196*, 110473. https://doi.org/10.1016/j.cie.2024.110473

Vu, H. M. (2020). A Review of Dynamic Capabilities, Innovation Capabilities, Entrepreneurial Capabilities and Their Consequences. *The Journal of Asian Finance, Economics and Business, 7*(8), 485-494. https://doi.org/10.13106/jafeb.2020.vol7.no8.485

Wang, H., Wang, W., & Jin, Z. (2024). Mechanism for allocating delay to constituent activities in project management. *Computers & Industrial Engineering, 197*, 110603. https://doi.org/10.1016/j.cie.2024.110603

Wasilkiewicz Edwin, K., Kongsvik, T., & Albrechtsen, E. (2024). An analysis of the relationship between project management and safety management in the Norwegian construction industry. *Safety Science, 180*, 106654. https://doi.org/10.1016/j.ssci.2024.106654

Yang, J., Liu, J., Yao, Z., & Ma, C. (2024). Measuring digitalization capabilities using machine learning. *Research in International Business and Finance, 70*, 102380. https://doi.org/10.1016/j.ribaf.2024.102380

Zhang, M., Chen, X., Xie, H., Esposito, L., Parziale, A., Taneja, S., et al. (2024). Top of tide: Nexus between organization agility, digital capability and top management support in SME digital transformation. *Heliyon, 10*(10), e31579. https://doi.org/10.1016/j.heliyon.2024.e31579