

The Impact of Digital Operational Capability on Business Profitability Performance of Small and Medium-sized Enterprises

Mingxiang Zhang, Yuanqi Li, and Xiaojun Ke*

Quanzhou University of Information Engineering, Quanzhou, Fujian 362000, China

Corresponding Author. E-mail: kexiaojun@qzuie.edu.cn

Received July 25, 2026; **Revised** August 23, 2026; **Accepted** August 28, 2026

Abstract

Against the backdrop of the digital economy, small- and medium-sized enterprises (SMEs) are trapped in the digital paradox of mismatched transformation input and return. Adopting a systematic literature-review method, this paper defines digital operational capability as enterprises' process-oriented capability to realize visualization, automation and intelligence of business activities supported by digital technologies. Based on the Resource-Based View and Dynamic Capabilities Theory, this study aims to sort out its conceptual system, unpack the mechanism linking digital operational capability and SMEs' profitability performance, and identify research gaps for future exploration. Digital operational capability, with four dimensions, positively improves SMEs' short-term financial performance (e.g., ROA), medium-term operational performance (e.g., inventory turnover) and long-term value performance (e.g., sustainable competitive advantage). Value transformation is realized via three paths: business model innovation, organizational capability upgrading and innovation cultivation, while constrained by internal-organizational, external-environmental and complementary-capability factors. SME digitalization features lightweight application, high external dependence and uncertain returns. This review puts forward targeted future research directions, offering theoretical references for SME digital operation practice and subsequent empirical research.

Keywords: Digital Transformation; Business Operations; Business Profitability; Organizational Innovation; Small and Medium-sized Enterprises (SMEs)

Introduction

With the large-scale application of digital technologies such as big data, artificial intelligence and cloud computing, digital transformation has become an inevitable choice for global enterprises to cope with market competition and achieve sustainable development. Since 2015, driven by Industry 4.0 initiatives across Europe and Southeast Asia, global SMEs have accelerated the adoption of various digital technologies. In the Thai research context, local SMEs are also promoting digital tool deployment while facing practical difficulties including talent shortages, capital shortages and uncertain digital-project returns. Compared with large enterprises, SMEs generally have inherent disadvantages such as limited capital reserves, weak technical foundation and shortage of professional talents, and thus face greater transformation pressure and survival challenges in the wave of digital economy (Rupeika-Apoga et al., 2022). In recent years, countries around the world have continuously introduced policies to promote the digital upgrading of SMEs. China has also taken the digital transformation of SMEs as a key task for the development of the digital economy. In practice, a large number of SMEs have begun to cultivate digital operational capability by deploying digital tools and reconstructing operational processes, with a view to achieving the core goals of reducing costs, increasing efficiency and improving profitability.

However, phenomena such as mismatched transformation input and return and the "digital paradox" are also prevalent among SMEs. Whether and how digital operational capability exerts an effect on business profitability performance remains a core topic of common concern in academia and industry. Prior literature has accumulated rich research outcomes on digitalization and firm-performance relationships (Guo & Xu, 2021; Teng et al., 2022). Existing research on digitalization and enterprise performance has accumulated rich achievements, but systematic reviews focusing on the dimension of operational capability for SME groups are still relatively scarce: some studies focus on the overall effect of digital transformation but fail to refine and disassemble the capability composition at the operational level; some studies discuss the performance impact of a single digital technology but lack an overall review of the capability-performance transmission path. Notably, mature digital-transformation frameworks for large enterprises cannot be directly applied to SMEs due to SMEs' resource scarcity and fragmented business processes.

Based on this, taking "the impact of digital operational capability on business profitability performance" as the core proposition, this paper puts forward explicit research objectives: to sort out core-concept connotations, reveal influence mechanisms and boundary conditions, and point out research gaps. The findings can offer practical references for SME entrepreneurs, enterprise managers and relevant policymakers. This paper systematically sorts out relevant domestic and foreign literature, clarifies the connotation and dimensions of core concepts, summarizes effects and action mechanisms, induces boundary conditions and situational characteristics, constructs an integrated theoretical framework, and points out the deficiencies of existing research and future research directions, so as to provide a theoretical basis for follow-up related research and reference for the digital operation practice of SMEs.

Literature Review

Literature retrieval was implemented in Scopus, Web of Science and ScienceDirect, using the search string ("digital operational capability" OR "digital capability") AND ("SME" OR "small and medium enterprise") AND ("profitability" OR "performance"). Inclusion criteria were peer-reviewed English journal articles published between 2020-2025; conference papers, book chapters and grey literature were excluded. A total of 427 initial records were retrieved, and 52 eligible journal articles were finally included after duplicate removal, title-abstract screening and full-text assessment.

1. Connotation and Dimensional Composition of Digital Operational Capability

Digital operational capability is the concrete embodiment of enterprise digital capability in operational scenarios, and its concept originates from research on digital business capability and digital transformation capability. Three interrelated constructs need to be distinguished: digital capability is a firm-level overarching construct covering strategy, organization, culture and technology; digital operational capability is its sub-dimension focusing on practical operational scenarios; dynamic capability represents high-order organizational capacity for sensing, seizing and reconfiguring resources to respond to environmental changes. Wielgos et al. (2021) define digital business capability as the comprehensive capability of enterprises to integrate market information, reconstruct business processes and create customer value relying on digital technologies, which is a high-order capability formed by the in-depth integration of digital resources and organizational processes. From the micro-foundation perspective, Sousa-Zomer et al. (2020) propose that digital transformation capability consists of three levels: sensing capability, seizing capability and reconfiguring capability, which is essentially a dynamic capability for enterprises to respond to environmental changes through digital resource allocation. For operational scenarios, Draganić (2023) points out that the core of digital operational capability is to realize the visualization, automation and intelligence of operational processes with the help of digital technologies, so as to ultimately achieve operational excellence, covering all operational links such as production, procurement, supply chain and marketing.

From the perspective of technical foundation, the integrated application of four core digital technologies, namely artificial intelligence, blockchain, cloud computing and big data analytics, serves as the core technical support for enterprises' digital operational capability, which can fully empower all operational links and realize value creation (Akter et al., 2022). Perifanis and Kitsios (2023) further confirm through a systematic review that artificial intelligence technology can create business value for enterprises by empowering operational decision-making and optimizing business processes, and is the core technical driving force for the upgrading of digital operational capability.

In terms of dimension division, existing studies have disassembled digital operational capability from different perspectives. The digital transformation capability maturity model developed by Gökalp and Martinez (2022) divides capability into five levels: strategy, organization, technology, operation and culture, among which the operational dimension covers core contents such as process digitalization and data-driven decision-making. It is worth

noting that the construction of digital capability is a gradual maturity improvement process, and this law is generally applicable to various organizations (Mohamed et al., 2022), and the cultivation of digital operational capability of SMEs also needs to follow the law of maturity evolution and upgrade step by step. Bag et al. (2025) combine the lean management perspective and propose that digital operational capability includes two modules: digital technology application capability and innovative lean management capability, and the synergy between the two is the key to improving operational performance. For the SME group, Rupeika-Apoga et al. (2022) point out that limited by resource constraints, the digital operational capability of SMEs is not a large and comprehensive system, but focuses on core modules such as digital technology adoption, basic operation digitalization and digital marketing, with the characteristics of lightweight and scenario-based application. In addition, some studies disassemble it into sub-dimensions such as digital marketing capability, supply chain digitalization capability and production operation digitalization capability from the functional dimension, laying a foundation for research on the performance impact of different dimensions.

2. Measurement Dimensions of Business Profitability Performance

Business profitability performance is a comprehensive reflection of enterprise operational results, and its measurement in existing studies mainly covers three levels: financial profitability, operational efficiency and sustainable performance.

Table 1 Measurement dimensions and concrete measurable indicators of business profitability performance

Performance Layer	Representative Measurable Indicators
Short-term financial profitability	ROA (Return on Assets), ROS (Return on Sales), profit margin
Medium-term operational efficiency	inventory turnover, delivery speed, product quality, market share, customer retention
Long-term sustainable value performance	brand equity, market agility, sustainable competitive advantage, stakeholder value

When studying the relationship between digital transformation capability and operational performance, Yu et al. (2022) operationalize operational performance into four indicators: production efficiency, cost control, product quality and delivery speed, focusing on the profit foundation at the operational level. Wang et al. (2023) start from a comprehensive performance perspective and divide enterprise performance into financial performance and market performance, among which financial performance includes core profit indicators such as profit margin and return on assets, which directly reflect the profitability of enterprises.

In studies targeting SMEs, Martínez-Peláez et al. (2023) point out that the improvement of sustainable performance by digital transformation needs to be realized through paths such as stakeholder collaboration and core capability building, among which the digital upgrading of operational capability is the core carrier for improving economic performance. In addition, some studies also incorporate market agility and customer value creation into the performance category, holding that the improvement of market response capability brought by digital capability is an important pre-performance of profit improvement (Li et al., 2021; Matarazzo

et al., 2021). On the whole, existing studies on the measurement of business profitability performance have formed a multi-level system of "financial profitability - operational efficiency - long-term value", but the adaptive measurement for SMEs still needs to be further refined.

3. Theoretical Basis

Existing studies mainly rely on the Resource-Based View (RBV) and Dynamic Capabilities Theory to explain the relationship between digital operational capability and profitability performance. The Resource-Based View holds that heterogeneous resources are the source of enterprises' competitive advantages, and digital operational capability, as a scarce and inimitable capability formed by the integration of digital technology and organizational resources, can bring sustainable performance advantages to enterprises (Wielgos et al., 2021). For resource-constrained SMEs, ordinary tangible and intangible operational resources can evolve into high-order dynamic capabilities via continuous digital-resource integration, process reconstruction and organizational learning. The Dynamic Capabilities Theory further explains the value creation logic of digital capability in a dynamic environment. Taking Italian SMEs as samples, Matarazzo et al. (2021) confirm that digital transformation capability is essentially a dynamic capability, which can help enterprises perceive market opportunities and reconstruct resource allocation, so as to create customer value and improve profitability. Mele et al. (2024) further expand the perspective of knowledge-based dynamic capabilities and propose that in the process of digital transformation, the dynamic adaptation of knowledge integration and digital capability is the core mechanism for enterprises to realize value creation. In addition, some studies conduct analysis combined with Organizational Ambidexterity Theory and Contingency Theory, providing theoretical support for understanding the boundary conditions of the relationship between the two (Belhadi et al., 2022; Shen et al., 2022).

Direct Effect of Digital Operational Capability on Business Profitability Performance of SMEs

Existing studies have generally confirmed that digital operational capability has a significant positive promoting effect on the business profitability performance of SMEs, and different dimensions of digital operational capability act on different levels of profitability performance through different paths. It is noteworthy that each capability dimension differs in benefit gestation cycles; excessive and misaligned technology investment may bring diminishing returns or short-term profit losses, and performance effects also show heterogeneity between manufacturing SMEs and service-sector SMEs.

1. Digital Marketing Capability: Market Expansion and Revenue Growth

Digital marketing capability is the most widely applied and most directly effective dimension in the digital operational capability of SMEs. An empirical study on Jordanian SMEs by Sharabati et al. (2024) finds that digital marketing can significantly improve the market share and revenue level of SMEs by expanding customer reach channels and accurately matching customer needs, and is the core starting point for digital profitability of SMEs. Focusing on cross-border e-commerce SMEs, Tolstoy et al. (2022) confirm that online marketing capability can indirectly improve the international performance of enterprises by

increasing international market penetration, and this effect is more significant in SMEs with limited resources.

Wang (2020) points out that the digital marketing capability of international enterprises can strengthen customer relationships and thus improve market performance and profitability, and this conclusion is also applicable to export-oriented SMEs. A study on Indonesian SMEs by Ibrahim et al. (2021) further finds that the collaborative application of digital marketing, digital payment and digital finance can significantly improve the financial performance of enterprises and realize the dual improvement of revenue and profit. In addition, through a literature review, Pandey et al. (2020) point out that digital marketing in B2B scenarios can improve enterprise profitability by reducing customer acquisition costs and improving customer conversion efficiency, providing a theoretical basis for the application of B2B digital marketing in SMEs. Digital marketing usually brings rapid short-term revenue growth and exerts more prominent value for service-sector SMEs.

2. Digital Supply Chain Capability: Cost Reduction, Efficiency Improvement and Resilience Enhancement

Supply chain digitalization is one of the core scenarios of operational digitalization for SMEs, and its improvement of profitability performance is mainly realized through cost saving and supply chain resilience enhancement. A study on procurement digitalization by Hallikas et al. (2021) finds that the application of data analysis capability in procurement processes can improve procurement efficiency and reduce procurement costs, thereby significantly improving the overall performance of the supply chain and providing cost-side support for enterprise profitability. Taking Malaysian manufacturing SMEs as samples, Hanaysha and Alzoubi (2022) confirm that digital supply chain capability can significantly improve organizational performance by improving supply chain response speed and reducing inventory levels and operating costs.

Belhadi et al. (2022) further point out that supply chain digitalization driven by Industry 4.0 technologies can improve long-term performance by enhancing supply chain sustainability, and this effect also exists in SMEs. The seven-element digital twin framework proposed by Ivanov (2024) provides a new direction for supply chain digital upgrading, pointing out that digital twin can realize full-process visualization and predictive management of the supply chain, further amplifying the improvement effect of digitalization on operational performance. Dolgui and Ivanov (2022) also point out that supply chain digitalization driven by 5G and Internet of Things technologies can improve supply chain flexibility through end-to-end connectivity and real-time visibility, helping SMEs cope with market fluctuations and ensure profit stability. Supply-chain digital transformation requires relatively long implementation cycles; its cost-saving and risk-resisting value is mainly reflected in medium- and long-term periods, with stronger benefits for manufacturing SMEs with complex logistics links.

3. Digital Production and Operation Capability: Efficiency Improvement and Quality Optimization

For manufacturing SMEs, digitalization of production and operation is the core path to improve profitability. A study on manufacturing enterprises by Buer et al. (2021) finds that digitalization can improve operational efficiency by optimizing production processes and

reducing production waste, thereby improving profitability. A multi-case study of medium-sized manufacturing enterprises by Bordeleau et al. (2020) confirms that the application of business intelligence and analytics technology in production and operation can realize data-driven production decision-making, improve production efficiency and product quality, and ultimately translate into profit growth.

Draganić (2023) further points out that digital operational capability is the core support for enterprises to achieve operational excellence, which can reduce operating costs through process standardization and automation, and improve operational efficiency and profit margins. The study by Domenek et al. (2022) also confirms that operational capability plays a mediating role between digital technology and operational performance, and digital technology ultimately achieves performance improvement by cultivating operational capability. For manufacturing SMEs, Singh et al. (2021) find through modeling analysis that digital transformation can improve enterprise performance through paths such as production efficiency improvement and product innovation, and this effect is universal in small and medium-sized manufacturing enterprises. Production-oriented digital capability brings obvious process-optimization gains for manufacturing SMEs, while service-sector SMEs obtain limited direct benefits from production-related digital investment.

4. Digital Decision-Making Capability: Data-driven Business Judgment and Risk Control

Digital decision-making capability represents SMEs' ability to collect, process and interpret multi-source business data, and apply data insights for operational judgment, risk warning and resource allocation. It acts as the data-driven decision-making brain for overall business operations, differing from marketing, supply-chain and production dimensions. Rajagopal et al. (2022) highlight that AI-enabled digital-decision frameworks support firms to judge dynamic market environments; for SMEs under resource constraints, such capability helps avoid blind resource input and optimize capital allocation efficiency. Even with limited data resources, SMEs can achieve preliminary data-driven judgment via lightweight analytical tools. Li et al. (2021) note that information-processing capability closely related to digital decision-making strengthens market agility, enabling SMEs to respond rapidly to market changes, avoid decision errors and stabilize profit levels. Without sufficient digital decision-making capability, marketing, supply-chain and production digital tools cannot deliver expected returns even with hardware-software deployment. This capability generates value for both manufacturing and service-sector SMEs.

5. Comprehensive Profit Effect of Overall Digital Transformation

In addition to sub-dimensions, a large number of studies confirm the comprehensive positive impact of the overall digital transformation of SMEs on profitability performance. Taking Chinese manufacturing enterprises as samples, Guo and Xu (2021) find that digital transformation can significantly improve enterprise performance, and the transformation performance elasticity of SMEs is higher than that of large enterprises, reflecting a certain late-mover advantage. An empirical study on Chinese SMEs by Teng et al. (2022) further confirms that digital transformation can improve enterprise performance through paths such as technological innovation and management optimization, and there is heterogeneity among

SMEs of different sizes and industries. Alojail and Khan (2023) also point out that digital transformation is the core driving force for enterprises to achieve sustainable development, and its improvement of economic performance is the foundation for supporting the long-term development of enterprises.

Mediating Mechanism of Digital Operational Capability Affecting Business Profitability Performance

Existing studies are not limited to the verification of direct effects, but further explore the transmission path of "digital operational capability → mediating variable → business profitability performance", revealing the action relationship between the two, among which business model innovation, organizational ambidexterity and innovation capability are the most verified mediating mechanisms. There exist potential chain-mediating relationships: digital operational capability first cultivates organizational ambidexterity, which further promotes business-model innovation and innovation-capability upgrading to jointly boost profitability. For resource-limited SMEs, exploration activities (developing new businesses) and exploitation activities (optimizing existing processes) face severe resource trade-offs. Without matching business-model and organizational-process adaptation, digital operational capability alone cannot bring real profit growth.

1. Mediating Role of Business Model Innovation

Business model innovation is the core path for digital operational capability to transform into profit growth. The empirical study of Wang et al. (2023) clearly points out that the impact of digitalization on enterprise performance is not realized directly, but takes business model innovation as a complete mediator. Digital capability ultimately realizes performance improvement by promoting the reconstruction of enterprises' value proposition, value creation and value acquisition modes. Adama and Okeke (2024) also confirm through a literature review that digital transformation is the core catalyst for business model innovation, and enterprises reconstruct their business models through digital capability, thereby opening up new profit growth points.

Bresciani et al. (2021) point out that digital transformation can simultaneously promote product innovation, process innovation and business model innovation, all of which act on the improvement of enterprise performance, among which business model innovation is the key link connecting technology and profitability. A study on digital servitization by Chen et al. (2021) also finds that the continuous interaction between digital technology and business model is the core for enterprises to realize value creation, and digital capability supports servitization transformation by promoting the iterative upgrading of business models, and ultimately improves profitability. Sjödin et al. (2023) focus on artificial intelligence and circular business model innovation, pointing out that artificial intelligence capability can promote circular business model innovation, thereby realizing a win-win situation of economic value and environmental value in digital servitization scenarios. For SMEs, Priyono et al. (2020) find that under the background of the epidemic, SMEs were able to break through the survival dilemma and realize profit recovery precisely by promoting business model adjustment and innovation

through digital capability, which confirms the mediating value of business model innovation in SME scenarios.

2. Mediating Role of Organizational Ambidexterity and Operational Capability

Organizational ambidexterity and operational capability are important intermediate carriers for digital capability to transform into performance. The study of Belhadi et al. (2022) confirms that organizational ambidexterity and digital business transformation play a chain mediating role between Industry 4.0 capability and sustainable supply chain performance. Digital technology first cultivates organizational ambidextrous capability, then promotes business transformation, and ultimately achieves performance improvement. A study on operational scenarios by Domenek et al. (2022) further clarifies that operational capability plays a complete mediating role between digital technology and operational performance. Digital technology itself cannot directly create value, and must be transformed into specific operational capabilities (such as process optimization capability and quality control capability) before it can act on operational performance and profitability performance. The latest study of Li et al. (2026) starts from the perspective of social capital and points out that the interaction between digital technology capability and social capital can promote operational improvement, and digital technology ultimately realizes profit improvement by activating internal and external social capital and optimizing operational processes.

3. Mediating Role of Innovation Capability

Innovation capability is also an important path for digital operational capability to affect business profitability performance. A study on SMEs by Borah et al. (2022) finds that social media usage can improve the sustainable performance of enterprises through the chain mediating effect of digital leadership and innovation capability, and digital application ultimately translates into performance output by cultivating innovation capability. An empirical study on SMEs by Zhen et al. (2021) also confirms that digital organizational culture and digital capability can improve performance by enhancing the innovation level of enterprises, and innovation is the core path for the value realization of digital capability. A study on Chinese manufacturing enterprises by Xu et al. (2023) further expands the scope of innovation, pointing out that digital transformation can promote eco-innovation, thereby improving the sustainable performance of enterprises and realizing a win-win situation of environmental and economic benefits. Nayal et al. (2022) also point out that in the digital era, the combination of circular economy practices and digital capability can promote enterprise innovation, thereby improving sustainable performance and helping enterprises achieve sustainable development goals.

Moderating Mechanism of the Action Boundary of Digital Operational Capability

The impact of digital operational capability on profitability performance is not static, but is regulated by multiple factors such as internal organizational context, external environment and complementary capabilities. Existing studies mainly discuss the boundary conditions of the relationship between the two from three levels. These moderators do not operate in isolation. Internal factors such as digital leadership and external factors such as government support produce configurational joint effects. Industry turbulence and market

uncertainty also significantly moderate the value-realization effect of digital operational capability.

1. Internal Organizational Factors

Internal organization is the core moderating variable affecting the value transformation of digital capability. The first is digital strategy and digital orientation. A study on SMEs by Rupeika-Apoga et al. (2022) finds that digital orientation is significantly positively correlated with digital capability, and the stronger the digital orientation of an enterprise, the more significant the improvement effect of digital capability on transformation performance. From the configurational perspective, Park and Mithas (2020) further propose that digital business strategy is a complex organic system, and the configurational matching of different capability dimensions is the key to achieving performance improvement, which provides theoretical support for understanding the synergy effect of digital operational capability. A study on start-ups by Proksch et al. (2024) also confirms that digital strategy can promote enterprise digitalization through the mediating effect of digital capability and digital culture, and digital culture plays a positive moderating role between digital capability and performance, strengthening the value transformation efficiency of digital capability.

The second is digital leadership. Borah et al. (2022) point out that digital leadership plays a moderating role between social media usage and innovation capability, and high-level digital leadership can strengthen the cultivation effect of digital application on innovation capability, thereby amplifying the performance improvement effect. In addition, organizational mindfulness is also an important internal moderating factor. Li et al. (2021) find that organizational mindfulness towards digital transformation is a prerequisite for information processing capability, which can strengthen the improvement effect of information processing capability on market agility, thereby helping enterprises respond quickly to the market and improve profitability. The study of Zhen et al. (2021) also confirms that digital organizational culture and organizational readiness can moderate the relationship between digital capability and innovation, and a good cultural atmosphere can improve the value creation efficiency of digital capability.

2. External Environmental Factors

External environmental factors also have a significant moderating effect on the relationship between the two. The first is digital innovation orientation. A study on the textile industry by Shen et al. (2022) finds that digital innovation orientation plays a positive moderating role between digital dynamic capability and transformation performance, and the stronger the innovation orientation of an enterprise, the more significant the improvement effect of digital capability on performance.

The second is government support. A study on small service enterprises by Chen et al. (2021) points out that the government plays a key role in the digital transformation of small enterprises, and policy support, financial subsidies and technical support can reduce the transformation cost of SMEs and strengthen the performance output of digital capability. In addition, industry characteristics are also important moderating variables. A study on Indian discrete manufacturing SMEs by Dutta et al. (2020) finds that there are significant differences in the priorities of digital transformation in different sub-industries, which leads to differences

in the impact paths and intensities of digital capability on performance across industries. Rajagopal et al. (2022) also point out that the application effect of the artificial intelligence-driven digital decision-making framework is affected by the industry environment, and the performance improvement effect of digital decision-making capability is more significant in industries with stronger dynamics. Under high market turbulence, digital operational capability shows stronger risk-buffering effects; its marginal profit-promoting effect declines in stable low-turbulence industries.

3. Moderating Effect of Complementary Capabilities

Digital operational capability does not function in isolation, but forms a complementary effect with other management capabilities, which jointly act on profitability performance. The classic study of Buer et al. (2021) confirms that there is a complementary effect between lean production and digitalization, and the combination of the two has a significantly greater effect on improving operational performance than a single factor, and lean management capability can strengthen the application effect of digital technology. Lean management first optimizes process logic; digital tools then amplify such process advantages to achieve $1+1>2$ synergies, instead of digital technology creating gains independently. The latest study of Bag et al. (2025) further verifies this conclusion, pointing out that the synergy between digital technology capability and innovative lean management capability is the core path for enterprises to improve operational performance, and the complementary integration of the two can achieve the effect of $1+1>2$.

Li et al. (2026) start from the perspective of social capital and point out that there is an interaction effect between social capital and digital technology capability. Internal-external social capital helps SMEs obtain external data resources, cooperate with supply-chain partners and absorb digital knowledge, so as to unlock the potential value of digital tools. Internal and external social capital can help enterprises better apply digital technology and tap data value, thereby strengthening the effect of digital capability on operational improvement. Khan et al. (2022) also point out that the combination of digital technology and circular economy practices can better improve supply chain performance, and the complementary integration of the two is the direction of future supply chain development.

Theoretical Research Framework of Digital Operational Capability Affecting Business Profitability Performance

Based on the above literature review, this paper integrates the dimensional composition of digital operational capability, action mechanisms, boundary conditions and multi-level measurement of profitability performance, and takes Dynamic Capabilities Theory and Resource-Based View as the core support to construct a theoretical research framework of digital operational capability and business profitability performance, as shown in Figure 1:

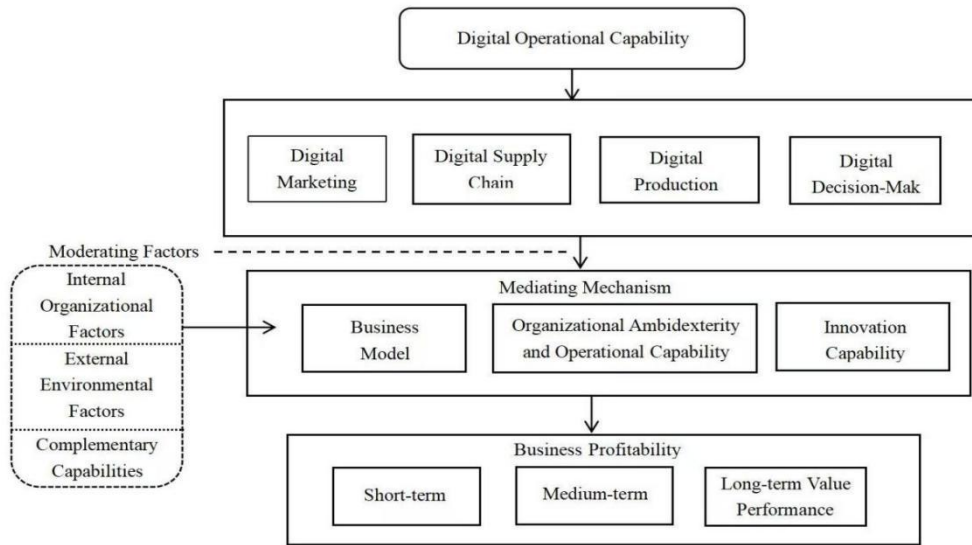


Figure 1 Theoretical Research Framework.

Several testable theoretical propositions derived from Figure 1 are proposed as follows:
P1 Digital operational capability (four sub-dimensions) exerts positive influences on SMEs' short-term, medium-term and long-term profitability performance.

P2 Business model innovation, organizational ambidexterity & operational capability, and innovation capability play mediating roles between digital operational capability and profitability performance; chain-mediation effects exist among these mediators.

P3 Internal organizational factors, external environmental factors and complementary capabilities moderate the above capability-performance relationships, and configurational joint effects exist across multi-level moderators.

Importance and Practical Challenges of Digital Operational Capability Building for SMEs

Compared with large enterprises, SMEs have significant differences in resource endowment, organizational structure, management mode and other aspects. Their digital operational capability building and value transformation are unique and face more practical challenges. The first is the characteristic of lightweight transformation under resource constraints. A study on SMEs under the background of the epidemic by Rupeika-Apoga et al. (2022) finds that limited by capital, technology and talents, the digital transformation of SMEs is not a full-process and systematic upgrading, but focuses on lightweight applications in core business scenarios, and digital operational capability presents scenario-based and fragmented characteristics. Priyono et al. (2020) also confirm that under the impact of the epidemic, the digital transformation path of SMEs has obvious gradual characteristics, mostly starting from partial adjustment of business models and gradually cultivating digital capability, rather than a one-step comprehensive transformation.

The second is strong dependence on external support. A study on small service enterprises by Chen et al. (2021) finds that small enterprises have weak digital capability on their own, and the government's policy guidance, financial support and technical services are crucial to their digital transformation, which is the key to making up for resource shortcomings and improving transformation performance. Philbin et al. (2022) also point out through a systematic review that the realization of sustainable digital transformation by SMEs is highly dependent on external ecological support, including policy support, supply of technical service providers, and empowerment of industry platforms. It is difficult for enterprises to realize the effective implementation of digital capability on their own. Meanwhile, SMEs under high external dependence face hidden risks of platform lock-in and over-reliance on third-party vendors. SMEs can adopt a phased capability-building roadmap: prioritize lightweight digital tools for core profit-related links, avoid blind large-scale tech investment, and match digital construction with internal organizational adjustment to prevent technology-only traps. Dutta et al. (2020) suggest that for manufacturing SMEs, the government should issue targeted transformation guidelines and support policies to help enterprises clarify digital priorities and reduce trial-and-error costs of transformation.

In addition, the uncertainty of transformation returns is higher. Imran et al. (2021) point out that the digital transformation of industrial organizations is a complex system engineering. For SMEs with imperfect management systems, the lack of an integrated transformation framework can easily lead to the disconnection between digital operational capability building and business, thus failing to achieve the expected profit improvement.

Discussion and Future Research Prospects

Through a systematic review of existing core literature in the past five years, it can be found that research on digital operational capability and enterprise profitability performance has achieved fruitful results, which not only confirms the positive relationship between the two, but also reveals the action mechanisms and boundary conditions from multiple perspectives, laying a solid theoretical foundation for follow-up research. However, existing studies still have the following deficiencies: first, the dimension division of digital operational capability for SMEs lacks adaptability and the measurement system is imperfect. Most existing studies follow the capability dimension division of large enterprises and fail to fully consider the characteristics of limited resources and scenario focus of SMEs, resulting in insufficient applicability of relevant measurement scales in SME scenarios (Rupeika-Apoga et al., 2022). Meanwhile, most studies take digital operational capability as an overall variable for analysis, and there is insufficient comparative research on the differentiated performance effects of different dimensions of capability, making it difficult to provide accurate capability building guidelines for SMEs. Second, the integrated research on action mechanisms is insufficient, and the systematic discussion on transmission paths needs to be deepened. Most existing studies solely verify the role of a certain mediating variable, and there is less discussion on the interaction effects and chain mediating relationships among multiple paths, making it difficult to fully reveal the complex black box of the transformation of digital operational capability

into profit (Wang et al., 2023; Belhadi et al., 2022). Meanwhile, there is a lack of mechanism research targeting SMEs, and the special transmission paths of SMEs under resource constraints have not been fully explored. Third, research on boundary conditions is relatively scattered, and coupling analysis of multi-level factors is lacking. Existing studies discuss moderating factors from internal, external and complementary capability perspectives respectively, but there is insufficient research on the interaction effects of different levels of moderating factors, failing to clearly present the complete boundary of value transformation of digital capability (Shen et al., 2022; Bag et al., 2025). In addition, research on heterogeneous boundaries of SMEs in different regions and industries is still relatively weak, making it difficult to explain the huge differences in transformation effects in practice. Fourth, insufficient attention is paid to the dynamic process and long-term effects of digital transformation. Most existing studies use cross-sectional data to verify the static relationship between the two, and there is less research on the dynamic evolution process of digital operational capability and the law of performance change at different transformation stages (Chen et al., 2021). Meanwhile, most studies focus on short-term financial performance, and there is insufficient discussion on the long-term profit effects, potential risks and negative effects brought by digital capability, which has certain one-sidedness in research.

Based on the deficiencies of existing research, future research can be further deepened from the following directions: first, develop a digital operational capability measurement system adapted to SMEs. Future scale development may focus on SME-specific indicators such as lightweight digital-tool adoption level, external-ecology cooperation degree, and resource-constrained data-driven decision-making capacity. Future research should be based on the resource characteristics and business scenarios of SMEs, refine and disassemble the dimensional composition of digital operational capability, and develop a measurement scale with situational adaptability to provide tool support for digital capability evaluation and empirical research of SMEs. Meanwhile, the differences in performance effects of different dimensions of capability can be further compared to clarify the priorities of digital capability building for SMEs. Second, deepen the integrated research on multiple transmission mechanisms. Future research can break through the analysis framework of single mediation, explore the chain mediation and interaction effects among business model innovation, organizational capability and innovation capability, and systematically reveal the complete path of digital operational capability transforming into profit. Meanwhile, focus should be placed on the SME group to explore the special transmission mechanisms under resource constraints and enrich the theoretical research on digital transformation of SMEs. Third, expand the coupling and heterogeneity research of multi-level boundary conditions. Future research can integrate three types of moderating factors: internal, external and complementary capabilities, explore the impact of the interaction effects of multiple factors on the digital capability-performance relationship, and clarify the optimal transformation paths in different contexts. Meanwhile, heterogeneity research should be strengthened to compare the differences of SMEs in different industries, scales and regions, so as to provide a theoretical basis for classified policy implementation. Fourth, pay attention to the dynamic process and long-term effects of digital transformation. Longitudinal multi-wave survey designs and qualitative

multiple-case study methodologies are strongly recommended for future empirical research to capture capability-evolution trajectories. Scholars should also pay attention to emerging practical topics including ethical risks, data-security risks and cost burdens brought by AI and big-data application in SMEs. Future research can use longitudinal tracking data to explore the dynamic evolution law of digital operational capability, analyze the performance change characteristics at different transformation stages, and reveal the long-term value of transformation. Meanwhile, attention should be paid to the potential risks and negative effects of digital transformation, and explore how to avoid the digital paradox and realize sustainable value creation of digital capability, so as to provide more comprehensive theoretical guidance for the digital transformation of SMEs.

Conclusion

Focusing on the core proposition of the impact of digital operational capability on business profitability performance of SMEs, this paper systematically sorts out relevant domestic and foreign research literature and draws the following core conclusions: first, digital operational capability is the core driving force for SMEs to cultivate competitive advantages and improve profitability in the digital era. It covers multiple dimensions such as digital marketing, supply chain digitalization, production and operation digitalization, and digital decision-making, and each dimension can improve the profitability performance of enterprises through corresponding paths. Second, the impact of digital operational capability on business profitability performance is not realized directly, but is transmitted through multiple mediating paths such as business model innovation, organizational capability improvement and innovation capability cultivation, among which business model innovation is the most core value transformation link. Third, the value transformation of digital operational capability is constrained by multiple boundary conditions. Internal organizational context, external institutional environment and complementary capabilities can all moderate the relationship between the two, and the collaborative integration of complementary capabilities such as lean management and social capital with digital capability is the key to improving the transformation effect. Fourth, the construction of digital operational capability for SMEs has the characteristics of lightweight under resource constraints, strong external dependence and high return uncertainty, and its transformation logic and capability cultivation path are significantly different from those of large enterprises, which requires targeted theoretical and practical guidance.

Theoretically, this review supplements existing digital-transformation literature by constructing an SME-oriented multi-dimension capability-performance framework and unpacking chain-mediation mechanisms and multi-factor configurational boundary conditions beyond large-enterprise-oriented research. Practically, for SME managers, it is suggested to prioritize lightweight digital construction matching actual business demands and emphasize business-model and organizational adaptation during digital deployment; for policymakers, differentiated supporting policies should be formulated according to industrial and regional heterogeneity to reduce SMEs' transformation trial-and-error costs. As artificial intelligence

and other digital technologies keep iterating, theories about SMEs' digital operational capability need continuous updating to adapt to changing business realities.

References

- Adama, H. E., & Okeke, C. D. (2024). Digital transformation as a catalyst for business model innovation: A critical review of impact and implementation strategies. *Magna Scientia Advanced Research and Reviews*, 10(2), 256-264. <https://doi.org/10.30574/msarr.2024.10.2.0066>
- Akter, S., Michael, K., Uddin, M. R., McCarthy, G., & Rahman, M. (2022). Transforming business using digital innovations: The application of AI, blockchain, cloud and data analytics. *Annals of Operations Research*, 308(1), 7-39. <https://doi.org/10.1007/s10479-020-03620-w>
- Alojail, M., & Khan, S. B. (2023). Impact of digital transformation toward sustainable development. *Sustainability*, 15(20), 14697. <https://doi.org/10.3390/su152014697>
- Bag, S., Rahman, M. S., Sharma, J., Chiarini, A., Srivastava, S. K., & Gupta, S. (2025). Building digital technology and innovative lean management capabilities for enhancing operational performance: An empirical study. *Production Planning & Control*, 36(8), 1009-1028. <https://doi.org/10.1080/09537287.2024.2327344>
- Belhadi, A., Kamble, S., Gunasekaran, A., & Mani, V. (2022). Analyzing the mediating role of organizational ambidexterity and digital business transformation on industry 4.0 capabilities and sustainable supply chain performance. *Supply Chain Management: An International Journal*, 27(6), 696-711. <https://doi.org/10.1108/SCM-04-2021-0152>
- Bordeleau, F. E., Mosconi, E., & de Santa-Eulalia, L. A. (2020). Business intelligence and analytics value creation in Industry 4.0: A multiple case study in manufacturing medium enterprises. *Production Planning & Control*, 31(2-3), 173–185. <https://doi.org/10.1080/09537287.2019.1631458>
- Borah, P. S., Iqbal, S., & Akhtar, S. (2022). 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>
- Bresciani, S., Huarng, K. H., Malhotra, A., & Ferraris, A. (2021). Digital transformation as a springboard for product, process and business model innovation. *Journal of Business Research*, 128, 204-210. <https://doi.org/10.1016/j.jbusres.2021.04.076>
- Buer, S. V., Semini, M., Strandhagen, J. O., & Sgarbossa, F. (2021). The complementary effect of lean manufacturing and digitalisation on operational performance. *International Journal of Production Research*, 59(7), 1976-1992. <https://doi.org/10.1080/00207543.2020.1790684>
- Chen, C. L., Lin, Y. C., Chen, W. H., Chao, C. F., & Pandia, H. (2021). Role of government to enhance digital transformation in small service business. *Sustainability*, 13(3), 1028. <https://doi.org/10.3390/su13031028>

- Chen, Y., Visnjic, I., Parida, V., & Zhang, Z. (2021). On the road to digital servitization—The (dis) continuous interplay between business model and digital technology. *International Journal of Operations & Production Management*, 41(5), 694-722. <https://doi.org/10.1108/IJOPM-08-2020-0544>
- Domenek, A. C., Moori, R. G., & Vitorino Filho, V. A. (2022). The mediating effect of operational capabilities on operational performance. *Revista de Gestão*, 29(4), 350-366. <https://doi.org/10.1108/REGE-01-2021-0016>
- Dolgui, A., & Ivanov, D. (2022). 5G in digital supply chain and operations management: Fostering flexibility, end-to-end connectivity and real-time visibility through internet-of-everything. *International Journal of Production Research*, 60(2), 442-451. <https://doi.org/10.1080/00207543.2021.2002969>
- Draganić, M. (2023). Managing the company's digital capability: A case for operational excellence. *Journal of Information and Organizational Sciences*, 47(1), 223-243. <https://doi.org/10.31341/jios.47.1.11>
- Dutta, G., Kumar, R., Sindhwani, R., & Singh, R. K. (2020). Digital transformation priorities of India's discrete manufacturing SMEs—A conceptual study in perspective of Industry 4.0. *Competitiveness Review: An International Business Journal*, 30(3), 289-314. <https://doi.org/10.1108/CR-03-2019-0031>
- Gökalp, E., & Martinez, V. (2022). Digital transformation maturity assessment: Development of the digital transformation capability maturity model. *International Journal of Production Research*, 60(20), 6282-6302. <https://doi.org/10.1080/00207543.2021.1991020>
- Guo, L., & Xu, L. (2021). The effects of digital transformation on firm performance: Evidence from China's manufacturing sector. *Sustainability*, 13(22), 12844. <https://doi.org/10.3390/su132212844>
- Hallikas, J., Immonen, M., & Brax, S. (2021). Digitalizing procurement: The impact of data analytics on supply chain performance. *Supply Chain Management: An International Journal*, 26(5), 629-646. <https://doi.org/10.1108/SCM-05-2020-0201>
- Hanaysha, J. R., & Alzoubi, H. M. (2022). The effect of digital supply chain on organizational performance: An empirical study in Malaysia manufacturing industry. *Uncertain Supply Chain Management*, 10(2), 495-510. <https://doi.org/10.5267/j.uscm.2022.1.003>
- Ibrahim, D., Nurjannahe, D., Mohyi, A., Ambarwati, T., Cahyono, Y., Haryoko, A. E., ... & Jihadi, M. (2021). The effect of digital marketing, digital finance and digital payment on finance performance of Indonesian SMEs. *International Journal of Data and Network Science*, 6(1), 37-44. <https://doi.org/10.5267/j.ijdns.2021.8.004>
- Imran, F., Shahzad, K., Butt, A., & Kantola, J. (2021). Digital transformation of industrial organizations: Toward an integrated framework. *Journal of Change Management*, 21(4), 451-479. <https://doi.org/10.1080/14697017.2021.1929406>
- Ivanov, D. (2024). Conceptualisation of a 7-element digital twin framework in supply chain and operations management. *International Journal of Production Research*, 62(6), 2220-2232. <https://doi.org/10.1080/00207543.2023.2217291>

-
- Khan, S. A. R., Piprani, A. Z., & Yu, Z. (2022). Digital technology and circular economy practices: Future of supply chains. *Operations Management Research*, 15(3), 676-688. <https://doi.org/10.1007/s12063-021-00247-3>
- Li, H., Wu, Y., Cao, D., & Wang, Y. (2021). Organizational 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.2020.10.033>
- Li, L., Liu, Y., Jin, Y., Jiang, N., & Cheng, T. E. (2026). Operational improvement in the digital era: Interplay between social capital and digital technology capabilities. *Journal of Business Research*, 206, 115973. <https://doi.org/10.1016/j.jbusres.2026.115973>
- Martínez-Peláez, R., Ochoa-Brust, A., Rivera, S., Félix, V. G., Ostos, R., Brito, H., ... & Mena, L. J. (2023). Role of digital transformation for achieving sustainability: Mediated role of stakeholders, key capabilities, and technology. *Sustainability*, 15(14), 11221. <https://doi.org/10.3390/su151411221>
- 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.2020.12.034>
- Mele, G., Capaldo, G., Secundo, G., & Corvello, V. (2024). Revisiting the idea of knowledge-based dynamic capabilities for digital transformation. *Journal of Knowledge Management*, 28(2), 532-563. <https://doi.org/10.1108/JKM-02-2023-0121>
- Mohamed Hashim, M. A., Tlemsani, I., & Duncan Matthews, R. (2022). A sustainable university: Digital transformation and beyond. *Education and Information Technologies*, 27(7), 8961-8996. <https://doi.org/10.1007/s10639-022-10968-y>
- Nayal, K., Kumar, S., Raut, R. D., Queiroz, M. M., Priyadarshinee, P., & Narkhede, B. E. (2022). Supply chain firm performance in circular economy and digital era to achieve sustainable development goals. *Business Strategy and the Environment*, 31(3), 1058-1073. <https://doi.org/10.1002/bse.2920>
- Pandey, N., Nayal, P., & Rathore, A. S. (2020). Digital marketing for B2B organizations: Structured literature review and future research directions. *Journal of Business & Industrial Marketing*, 35(7), 1191-1204. <https://doi.org/10.1108/JBIM-06-2019-0283>
- Park, Y., & Mithas, S. (2020). Organized complexity of digital business strategy: A configurational perspective. *MIS Quarterly*, 44(1), 85-128. <https://doi.org/10.25300/MISQ/2020/14477>
- Perifanis, N. A., & Kitsios, F. (2023). Investigating the influence of artificial intelligence on business value in the digital era of strategy: A literature review. *Information*, 14(2), 85. <https://doi.org/10.3390/info14020085>
- 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>

-
- Priyono, A., Moin, A., & Putri, V. N. A. O. (2020). Identifying digital transformation paths in the business model of SMEs during the COVID-19 pandemic. *Journal of Open Innovation: Technology, Market, and Complexity*, 6(4), 104. <https://doi.org/10.3390/joitmc6040104>
- 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>
- Rajagopal, N. K., Qureshi, N. I., Durga, S., Ramirez Asis, E. H., Huerta Soto, R. M., Gupta, S. K., & Deepak, S. (2022). Future of business culture: An artificial intelligence-driven digital framework for organization decision-making process. *Complexity*, 7796507. <https://doi.org/10.1155/2022/7796507>
- 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>
- Sharabati, A. A. A., Ali, A. A. A., Allahham, M. I., Hussein, A. A., Alheet, A. F., & Mohammad, A. S. (2024). The impact of digital marketing on the performance of SMEs: An analytical study in light of modern digital transformations. *Sustainability*, 16(19), 8667. <https://doi.org/10.3390/su16198667>
- 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.3518>
- Singh, S., Sharma, M., & Dhir, S. (2021). Modeling the effects of digital transformation in Indian manufacturing industry. *Technology in Society*, 67, 101763. <https://doi.org/10.1016/j.techsoc.2021.101763>
- Sjödin, D., Parida, V., & Kohtamäki, M. (2023). Artificial intelligence enabling circular business model innovation in digital servitization: Conceptualizing dynamic capabilities, AI capacities, business models and effects. *Technological Forecasting and Social Change*, 197, 122903. <https://doi.org/10.1016/j.techfore.2023.122903>
- Sousa-Zomer, T. T., Neely, A., & Martinez, V. (2020). Digital transforming capability and performance: A microfoundational perspective. *International Journal of Operations & Production Management*, 40(7-8), 1095-1128. <https://doi.org/10.1108/IJOPM-06-2019-0444>
- 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>
- Tolstoy, D., Nordman, E. R., & Vu, U. (2022). The indirect effect of online marketing capabilities on the international performance of e-commerce SMEs. *International Business Review*, 31(3), 101946. <https://doi.org/10.1016/j.ibusrev.2021.101946>

- Wang, F. (2020). Digital marketing capabilities in international firms: A relational perspective. *International Marketing Review*, 37(3), 559-577.
<https://doi.org/10.1108/IMR-05-2019-0142>
- Wang, Z., Lin, S., Chen, Y., Lyulyov, O., & Pimonenko, T. (2023). Digitalization effect on business performance: Role of business model innovation. *Sustainability*, 15(11), 9020. <https://doi.org/10.3390/su15119020>
- 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>
- Xu, J., Yu, Y., Zhang, M., & Zhang, J. Z. (2023). Impacts of digital transformation on eco-innovation and sustainable performance: Evidence from Chinese manufacturing companies. *Journal of Cleaner Production*, 393, 136278.
<https://doi.org/10.1016/j.jclepro.2023.136278>
- Yu, J., Wang, J., & Moon, T. (2022). Influence of digital transformation capability on operational performance. *Sustainability*, 14(13), 7909.
<https://doi.org/10.3390/su14137909>
- Zhen, Z., Yousaf, Z., Radulescu, M., & Yasir, M. (2021). Nexus of digital organizational culture, capabilities, organizational readiness, and innovation: Investigation of SMEs operating in the digital economy. *Sustainability*, 13(2), 720.
<https://doi.org/10.3390/su13020720>