

Digitalization and Smes' Sustainable Performance: A Conceptual Framework in the Context of Wuhan, China

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Abstract:

Digitalization has emerged as a transformative force for small and medium-sized enterprises (SMEs), enabling them to enhance operational efficiency, competitiveness, and long-term sustainability. However, the extent to which digitalization influences SMEs' sustainable performance—spanning economic, environmental, and social dimensions—remains underexplored, particularly in the context of Wuhan, China. This conceptual paper aims to develop a theoretical framework that examines the role of digitalization in driving SMEs' sustainable performance by integrating the Resource-Based View (RBV), Dynamic Capabilities Theory (DCT), and Institutional Theory. The study highlights key enablers and barriers to digital adoption among SMEs and emphasizes the significance of government policies, organizational digital capabilities, and sustainability-driven digital strategies. By synthesizing existing literature, this paper provides a structured conceptual model to guide future empirical research and policy development. The findings offer valuable insights for SME managers, policymakers, and researchers, underscoring the need for strategic digitalization investments, institutional support, and capacity-building initiatives to foster sustainable business growth.

Keywords: Digitalization, SMEs, Sustainable Performance, Resource-Based View, Dynamic Capabilities Theory, Institutional Theory

1.0 Introduction

Digitalization is a communication-jam in order to disrupt industries, business models, and grow economies in the modern business ecosystem. This means the integration of digital technologies in

every aspect of business operations resulting in improved efficiency, decision-making and competitiveness. With all industries including their own adapting to digital tools, it is only right for SME companies to bolster their growth through digitalization and long-term strategy for the future.

As SMEs are a pillar of economic development, they do play a particularly important role in emerging economies including China. They represent a sizable portion of employment and foster innovation, economic diversification, and industrial development. SMEs, however, are often short on resources, which may limit their capacity to compete with larger enterprises. Adding to the gap are the factors that an opportunity for SMEs to improve productivity, build more efficient processes, and better interact with customers is to seek digitalization (Vide et al., 2022). Moreover, through the adoption of digital technologies, it is also important for SMEs to embrace sustainability initiatives, to include resource optimization, reduction of environmental impact and social responsibility in their business models (Yuen & Baskaran, 2024).

China has been at the forefront of digital transformation, with state-led initiatives to accelerate the digitalization of enterprises. Policies like the "Made in China 2025" initiative and smart city programs have catalyzed digital adoption across industries, laying the groundwork for small and medium enterprises (SMEs) to embrace digital technologies in day-to-day operations. As one of the key economic and technological hubs in China, digitalization among SMEs has received increased attention in Wuhan (Wübbeke et al., 2016). The local government created a series of different programs such as digital training initiatives, financial incentives, and support services for businesses to motivate SMEs to use digital technologies (Teng, Wu, & Yang, 2022).

However, SMEs in Wuhan still encounter some specific issues in the digital transformation process due to these improvements. Barriers to the use of digital tools include high costs associated with initial investment, a lack of digital skills among employees, and concerns over data security (Chen et al., 2024). There is also some ambiguity regarding digitalization sustainability business practices and financial performance in the short term. As the digital transformation continues, it is important to examine how digital transformation can affect SMEs' sustainable performance from the perspective of economic, social, and environmental dimensions (Xie & Xu, 2024).

1.2 Problem Statement

The contributions of digitalization to better business performance have gained broader acknowledgment; however, the specific influence of digitalization on SMEs' sustainable performance—spanning economic, environmental, and social aspects—needs to be more fully discovered. Current research revolves around the impact of digitalization for facilitating higher efficiency, business agility and innovation. Nonetheless, limited attention has been paid to the critical role of digital transformation in promoting the long-term sustainability of SMEs, especially in the case of Wuhan, China (Teng, Wu, & Yang, 2022).

Moreover, while SMEs in Wuhan have increasingly adopted digital tools such as e-commerce

platforms, cloud computing, and big data analytics to improve business operations, it is still unclear whether these initiatives translate into sustainable growth. Many SMEs struggle with the complexity of digital transformation and its alignment with sustainable business models (Chen, Zhang, Cai, & Chen, 2024). Additionally, existing studies have primarily examined digitalization within large corporations or developed economies, with limited focus on SMEs operating in China's dynamic and evolving economic landscape. Thus, there is a need for a conceptual study that investigates digitalization's role in shaping SMEs' sustainable performance in Wuhan, identifying potential enablers and barriers (Liu et al., 2024).

1.3 Research Objective

The objective of this conceptual paper is:

- To identify the influence of digitalization on SMEs' sustainable performance among SMEs in Wuhan province, China.

1.4 Research Question

The research question of this conceptual paper is:

- What is the influence of digitalization on SMEs' sustainable performance among SMEs in Wuhan province, China?

1.5 Significance of Study

This study adds value to literature, practice, and policy by exploring the synergetic relationship between the emerging field of digitalization and sustainability in SMEs. From a theory perspective, it draws upon the Resource-Based View (RBV), Dynamic Capabilities Theory, and the Institutional Theory to propose a thorough understanding of how SMEs implement their sustainable business development process using their digitalization resources and capabilities. This conceptual extension contributes to existing research by demonstrating how digitalization facilitates SMEs' economic, environmental, and social sustainability mechanisms.

Practically speaking, the study contributes to SME managers in Wuhan. It emphasizes various benefits of digitalization such as operational efficiency, cost savings, and meeting compliance concerning Certification environmental sustainability. So that SME can understand how digitalization could make them more resilient and competitive in this increasingly digital and sustainability conscious market.

Policymakers also stand to benefit from this study, as it provides evidence-based recommendations for strengthening SME digital adoption strategies in Wuhan. By identifying key barriers and enablers, such as access to digital infrastructure, financial incentives, and training programs, this study underscores the need for tailored government interventions to ensure SMEs can successfully integrate digital technologies into their sustainability efforts. Through these contributions, this conceptual study lays the foundation for future empirical research and practical applications in SME digital transformation and sustainable business practices.

2.0 Literature Review

2.1 Digitalization in SMEs: Concept and Evolution

Digitalization has gained recognition as a transformative force in the functioning of small and medium-sized enterprises (SMEs), opening avenues for increased efficiency, market expansion, and competitive advantage. It encompasses the nuances of implementing and incorporating digital technologies, including but not limited to big data analytics, artificial intelligence (AI), the Internet of Things (IoT), and cloud computing, to support business processes and decision-making. Digital transformation denotes a strategic, holistic change in business models while digitalization is characterized by incremental changes to business processes through technology adoption (Teng, Wu, & Yang, 2022).

Historically, SMEs have encountered hurdles with digitization, including high deployment costs, labour shortages, and a lack of incentive to change. However, technological advancements in affordable cloud-based solutions, digital platforms, and automation tools have made digitalization more accessible than ever for SMEs across industries (Amuzu et al., 2024). Research indicates that SMEs with higher digital maturity outperform competitors on productivity, innovation, and profitability. In addition, digitalization allows SMEs to increase supply chain efficiency, optimize customer engagement process, and expand to international markets (Bangun et al., 2024) and thus requires various attention as a core element of sustainable business strategies.

2.2 The Role of Digitalization in SMEs' Sustainable Performance

Sustainability in SMEs has gained prominence due to increasing environmental regulations, stakeholder expectations, and competitive pressures. Sustainable performance is examined through the Triple Bottom Line (TBL) framework, which includes economic, environmental, and social dimension. Research suggests that digitalization serves as a strategic enabler of sustainable business models by allowing SMEs to adopt data-driven decision-making, energy-efficient processes, and circular economy practices (Martínez-Peláez et al., 2024).

Economically, digitalization enhances SMEs' financial sustainability by reducing operational inefficiencies, automating processes, and optimizing resource allocation. AI-powered tools improve demand forecasting, minimizing inventory waste and maximizing profitability (Trueba-Castañeda et al., 2024). Environmentally, digital tools such as blockchain technology for supply chain transparency and IoT-enabled smart sensors enable SMEs to track carbon footprints and reduce energy consumption (Hoffmann & Kühnhold, 2023). Socially, digitalization fosters inclusivity by enabling remote work, enhancing employee digital literacy, and promoting ethical business practices. However, while digitalization offers numerous sustainability benefits, its adoption in SMEs remains inconsistent, with many firms struggling to balance technological investments with short-term financial pressures (Raihan, 2024).

2.3 Empirical Evidence on Digitalization and Sustainability in SMEs

Several empirical studies have examined the impact of digitalization on SMEs' sustainable performance. Research in European SMEs indicates that digital adoption significantly improves energy efficiency, waste management, and financial resilience. Similarly, studies conducted in emerging economies suggest that digitalization enhances SMEs' ability to meet environmental regulations, optimize production processes, and create new market opportunities.

A study by Roziqin (2025) found that cloud-based enterprise resource planning (ERP) systems helped SMEs reduce administrative costs by 23% while improving compliance with sustainability standards. Another study focusing on Asian SMEs revealed that AI-driven automation led to a 30% reduction in material waste and a 15% increase in productivity, highlighting digitalization's role in resource efficiency and cost savings (Bangun et al., 2024). However, while larger SMEs benefit more from digital adoption, micro-enterprises often struggle due to financial and technological barriers (Ahmad et al., 2023).

Despite these positive trends, digitalization in SMEs also presents challenges. Research indicates that cybersecurity threats, data privacy concerns, and lack of skilled personnel hinder SMEs from fully leveraging digital tools for sustainability (Telukdarie et al., 2024). Additionally, while digitalization supports economic and environmental sustainability, its impact on social sustainability remains underexplored, necessitating further research into its role in workforce well-being and ethical business governance (Brenner & Hartl, 2021). Studies suggest that digitalization may contribute to psychosocial risks at work, affecting employee well-being and job security, which raises concerns about its long-term implications for SMEs (Palumbo, Casprini, & Montera, 2022).

2.4 Theoretical Perspectives on Digitalization and Sustainability

2.4.1 Resource-Based View (RBV)

The Resource-Based View (RBV) theory provides a framework for understanding how firms gain competitive advantages by leveraging valuable, rare, inimitable, and non-substitutable (VRIN) resources. According to RBV, firms that effectively manage and utilize their internal resources, such as unique knowledge, technological capabilities, and strong supplier relationships, are better positioned to sustain long-term competitive advantages (Lubis, 2022). Studies suggest that RBV is particularly useful in analyzing how SMEs can leverage limited resources to maintain competitive positioning in dynamic markets (Yuga & Widjaja, 2020). In the context of SMEs, digital technologies such as big data analytics, AI-driven insights, and cloud infrastructure serve as strategic resources that enhance business performance and sustainability (Vo et al., 2024).

According to RBV, digitalization provides SME with a sustained competitive advantage by facilitating them in building unique operational capabilities that not only help them in differentiating themselves from competitors but also enhance their operational efficiency, transparency and cost reduction. For instance, SMEs that harness predictive analytics using AI can bring about supply chain optimization,

lead to waste minimization, and, thus, ensure long-term resilience (Ahmad et al., 2023). But digitalization is not enough — SMEs will need digital skills, strategic management practices, and the ability to shape technology in line with sustainability objectives to reap the payoffs.

2.4.2 Dynamic Capabilities Theory (DCT)

The Dynamic Capabilities Theory (DCT) emphasizes the ability of firms to sense opportunities, seize competitive advantages, and transform resources in response to market changes. Digitalization enables SMEs to adapt to evolving business environments, regulatory frameworks, and sustainability demands (Bangun et al., 2024).

Empirical studies suggest that SMEs with strong digital capabilities can rapidly integrate green innovations, enhance energy efficiency, and comply with global sustainability standards (Roziqin, 2025). For example, firms that leverage digital twins—a technology that creates virtual models of real-world business processes—can simulate environmental impacts and optimize production efficiency (Van Der Krogt, Rensma, & Van Reijswoud, 2023). However, the success of digital adoption in SMEs depends on organizational agility, leadership support, and continuous investment in technological learning (Fan, 2024).

2.4.3 Institutional Theory

The Institutional Theory suggests that external factors such as government policies, industry standards, and social expectations affect organizations. Due to SME digitalization, the concept of institutional pressure had a significant effect to drive their sustainability initiatives. Governments across the globe have taken the initiative and implemented various policies to motivate SMEs to transition to sustainable digital solutions. In China, the digital transformation of SMEs has been promoted through financial incentive policies, tax concessions, and government-backed digital platforms (Muhammad et al., 2025). For example, subsidies for smart manufacturing and digital supply chain systems have enabled SMEs to lower emissions and meet regulatory requirements (Raihan, 2024).

However, institutional pressures can also create compliance burdens, particularly for SMEs with limited resources and technical expertise. Research highlights that while regulatory frameworks encourage digital sustainability, overly complex policies may hinder SMEs' ability to fully embrace digital adoption (Zafar, Hashmi, & Ahmed, 2024).

2.5 Conceptual Framework

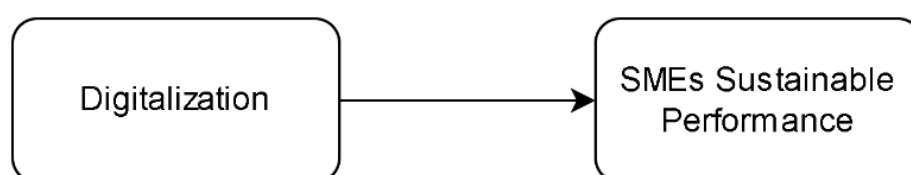


Figure 1: Conceptual Framework of current study

2.6 Hypotheses Development

From the perspective of RBV, digitalization is a strategic resource that improves SMEs' capabilities to be competitive and sustainable in the long run (Mushtaq et al., 2024). On the other hand, DCT presents focus on flexibility that firms with vital digital capabilities can quickly adopt sustainable practices and meet regulatory and market expectations (Singh et al., 2023). In addition, Institutional Theory emphasizes external forces, including government regulations and consumer expectations, which affect SMEs' choice to implement digital solutions for sustainable practices (Ali & Johl, 2023). Considering the continued need for digital tools usage for business success and sustainability, this study postulates the next hypothesis:

H1: Digitalization positively influences SMEs' sustainable performance.

3.0 Methodology

This theoretical paper utilizes a theoretical research design to analyze the relationship between digitalization and SMEs sustainable performance in Wuhan, China. The objective is to structure a concept framework to guide further investigations into empirical data only because this study does not collect primary data but synthesizes theories and empirical literatures. Based on Resource Based View (RBV), Dynamic Capabilities Theory (DCT), and Institutional Theory, this study investigates digitalization as an enabler of economic, environmental, and social sustainability for SMEs and also discusses barriers and institutional determinates that impact digital adoption among small businesses.

While no evaluation was performed in this paper, future research with a quantitative survey, longitudinal case, or industry-specific comparison would validate the proposed framework empirically. A framework based on survey data with structural equation modeling (SEM) could evaluate the causal relationships between the degree of digital adoption and sustainable business performance, while interviews with SME owners, digital transformation consultants, and policymakers could bring contextual insights on the barriers and success factors in the adoption of digital sustainability.

The choice of a conceptual research approach is justified because the intersection of digitalization and SMEs' sustainable performance remains an evolving area of study, particularly in the context of emerging economies such as China. By synthesizing existing theoretical insights and empirical evidence, this paper aims to fill theoretical gaps, identify critical mediators/moderators, and propose a structured model for understanding how SMEs can strategically leverage digitalization for sustainable business outcomes. The proposed conceptual model serves as a foundation for future empirical inquiries, offering a theoretical basis for policy recommendations, managerial strategies, and further academic exploration in SME digital transformation and sustainability.

4.0 Discussion

The relationship between digitalization and SMEs' sustainable performance is increasingly recognized as a key area of business and economic research. This study integrates insights from the Resource-

Based View (RBV), Dynamic Capabilities Theory (DCT), and Institutional Theory to explain how digitalization contributes to the economic, environmental, and social sustainability of SMEs. In this section, the current paper discusses the theoretical implications, managerial relevance, and policy considerations based on the conceptual framework developed in this study.

4.1 Theoretical Implications

This conceptual study contributes to existing theories by framing digitalization as a strategic enabler of SMEs' sustainability performance. It is the resource-based view (RBV) which enables a particular understanding of how digital resources, like AI-enabled analytics, enhancing cloud computing and bring transparency to supply chains through blockchain, may provide sustainable competitive advantage to SMEs. Digitalization increases efficiency, lowers costs, and improves resource use, which contributes to economic sustainability. However, SMEs need to build organizational capabilities to manage and integrate digital tools within operations.

The Dynamic Capabilities Theory (DCT) supports the argument that digitalization enables SMEs to sense opportunities, seize digital-driven competitive advantages, and continuously transform their business models. SMEs that rapidly adopt data analytics, digital marketing, and process automation tend to be more resilient and adaptive, particularly in the face of market volatility and environmental regulations. Digital capabilities further support environmental sustainability by enabling energy efficiency, sustainable resource management, and the implementation of circular economy principles.

The Institutional Theory highlights how external pressures from governments, industry standards, and customer expectations influence SMEs' digital adoption. In China, government-led digital transformation initiatives, such as financial incentives for tech-driven sustainability programs and industry regulations on carbon footprint tracking, play a crucial role in encouraging SMEs to integrate digital tools into their sustainability strategies. However, SMEs may face compliance burdens, digital skill shortages, and resistance to technology adoption, which require institutional support for effective implementation.

Through these three theoretical perspectives, this study contributes to the conceptual understanding of how digitalization fosters sustainable business practices in SMEs. Future empirical research should validate these theoretical propositions by examining the mediating role of digital literacy, government support, and organizational culture in SMEs' digital transformation efforts.

4.2 Managerial Implications

For SME managers, this study highlights the strategic importance of digital adoption in enhancing business sustainability. Digitalization is no longer optional but a necessity for long-term competitiveness and regulatory compliance. Managers should prioritize investments in digital infrastructure, workforce training, and digital business strategies to ensure sustainable growth.

One of the key managerial takeaways is that digitalization can significantly reduce operational costs

while improving efficiency. SMEs that integrate automated accounting systems, customer relationship management (CRM) tools, and AI-powered supply chain management can optimize their financial resources, leading to greater economic sustainability. Additionally, managers should explore green digital solutions, such as IoT-based energy monitoring and blockchain-enabled supply chain traceability, to align with environmental sustainability goals.

Despite these opportunities, SME managers must address internal challenges such as employee resistance to digital transformation, cybersecurity risks, and integration costs. A step-by-step digital adoption strategy, starting with low-cost digital tools such as cloud-based project management and e-commerce platforms, can ease the transition. Additionally, collaborating with digital solution providers, industry associations, and government-backed training programs can help SMEs enhance their digital capabilities.

4.3 Policy Implications

From a policy perspective, this study underscores the need for stronger governmental and institutional support to facilitate SME digitalization for sustainability. While China has introduced various digital transformation policies, including subsidies for cloud computing adoption and tax incentives for eco-friendly business practices, there is still a need for more targeted interventions to address SMEs' unique constraints.

Therefore, policymakers must consider expanding digital literacy programs, offering financial incentives for embracing digital innovation, and easing regulatory compliance for small and medium-sized enterprises. Things like subsidized digital training for SME employees will help solve the skills deficit issue, and simple funding for digital transformations can mitigate the costs in the early stages.

Moreover, governments and industry regulators should ensure that SMEs are not left behind in the digital economy. Policies should promote access to affordable digital solutions, particularly for micro and small enterprises that may lack the resources to adopt advanced technologies. Additionally, creating SME-specific sustainability guidelines and digitalization roadmaps can help businesses navigate the transition towards technology-driven sustainability.

Finally, international collaboration on digital sustainability standards can help SMEs align with global supply chain requirements. With increasing emphasis on green supply chains and digital trade regulations, SMEs must be equipped with the right digital tools and regulatory knowledge to remain competitive in both domestic and international markets.

5.0 Conclusion

This conceptual paper investigates the impact of digitalization (IV) on the sustainable performance (DV) of SMEs in Wuhan, China, including economic, environmental, and social dimensions. The study develops a theoretical framework that integrates Resource-based View (RBV), Dynamic Capabilities Theory (DCT), and Institutional Theory and provides insights on how digital adoption

enhances sustainability in SMEs, while mitigating key challenges, including financial constraints, technological barriers, and regulatory uncertainties. Digitalization thus becomes an imperative with enormous potential for SMEs to enhance operational agility, optimize resource allocation, improve their business models, and strengthen their market dynamism; and thereby strive for sustainable innovation to survive and grow. It will be an important success, but will require strategic investments, institutional support, and the development of digital capabilities. This study is a steppingstone for future empirical validation and also creates awareness regarding how policymakers and SME managers can better structure digital adoption strategies for long term sustainable business growth.

5.1 Future Study Recommendations

Quantitative methods are needed for assessing the empirical validity of the proposed framework, so future research can make use of approaches like structural equation modeling (SEM) or regression analysis to test the proposed relationships between digitalization and sustainability performance of SMEs. Industry specific studies may cover how the digital differences between SME sectors contribute to achieving sustainability. Furthermore, researchers must explore potential mediators and moderators such as innovation capability, financial accessibility, and regulatory policies to assess the extent to which digitalization can drive sustainability. Investigating how institutional setups in different regions or nations impact digital transformation in SMEs could provide a more comprehensive comparison. Longitudinal studies would be useful to investigate the long-term effect of digitalization on SME sustainability, monitoring changes over time and considering critical success factors. Using a mixed-method approach that combines quantitative data analysis with qualitative case studies or interviews may provide a more nuanced view of how SMEs respond to digitalization challenges. This indicates that by looking at the potential areas of future research, the next studies can validate the conceptual model empirically as well as practical strategies to improve SME digitalization which reconciles sustainable growth.

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