

A SYSTEMATIC REVIEW OF DIGITAL TECHNOLOGY ADOPTION IN SMALL AND MEDIUM-SIZED ENTERPRISES: IMPLICATIONS FOR PERFORMANCE IN DEVELOPING COUNTRIES

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Abstract

Small and medium-sized enterprises (SMEs) are crucial for economic development, yet they face resource constraints and regulatory limitations. The advent of digital technologies presents transformative opportunities for SMEs, enabling them to overcome traditional obstacles and enhance performance, growth, innovation, and social inclusion. This systematic review examines the impact of digital technology adoption on SME performance in developing countries. The study utilized a systematic search strategy to retrieve pertinent literature from electronic databases from 2017 to 2023. Results reveal that adopting digital technology enhances SME performance across the operational, financial, market, and customer relationship metrics. These findings have implications for policymakers and practitioners, emphasizing the importance of promoting digital technology adoption among SMEs through supportive policies, training, and infrastructure.

Keywords: Digital Technology Adoption, SMEs, Performance Indicators, Developing countries, Systematic Review

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Introduction

Small and medium-sized enterprises (SMEs) play a crucial role in developing nations' economic development and poverty reduction (World Bank, 2020; Manzoor, Wei, & Sahito, 2021). The SMEs face resource constraints, insufficient infrastructure, and regulatory limitations (UNCTAD, 2019; Dimoso & Andrew, 2021). Nevertheless, the advent of digital technologies has initiated a period of transformation, offering opportunities for SMEs in these areas amidst challenging business environments (World Bank, 2016; Kitole & Sesabo, 2024). Utilising digital technologies presents significant opportunities for improved performance, growth, innovation, and social inclusion among SMEs in developing countries, and have greater chances of reducing poverty across different sectors (Kitole & Sesabo, 2022).

Integrating digital tools, systems, and processes into business operations has become a critical strategy for enhancing the competitiveness and sustainability of SMEs in these regions (FAO, 2022; Kitole, & Genda, 2024). By utilising mobile payments, e-commerce platforms, and cloud-based services, SMEs can overcome traditional obstacles to market entry, reduce transaction costs, and expand their market presence. This approach enhances access to novel markets and prospects, fostering sustainable expansion and diversification within the market for these businesses. Additionally, digital technologies can enable SMEs to optimise their processes, enhance efficiency, and quickly adjust to changes in market dynamics (Gaglio, CKraemer-Mbula & Lorenz, 2022; Kitole, Mkuna, & Sesabo, 2024).

Utilising digital technologies allows SMEs to effectively enhance their competitiveness, innovation, and expansion within the evolving digital landscape of the global economy. Acknowledging this potential, SMEs on a global scale are swiftly integrating these technologies into their operations. However, the degree and consequences of digital technology adoption among SMEs differ across regions and industries in developing nations (Kitole, Lihawa, Sesabo, & Shitima; 2023; Cusolito, Lederman, & Peña, 2020). Various factors, including access to financial resources, digital infrastructure, and digital literacy, play a significant role in influencing SMEs to adopt and utilise digital technologies. Additionally, regulatory frameworks, institutional support, and societal norms shape developing nations' digital entrepreneurship and innovation environments (Urban, 2019; Lukonga, 2020; Kitole, Tibamanya, & Sesabo, 2023; Kek, Sivakumar, & Kandasamy, 2023).

As SMEs continue to embrace digital technologies, the potential impacts on their performance are significant in developing countries. This highlights the importance of conducting comprehensive studies to assess the impact of such adoption on their performance. Current research tends to focus on individual sectors or geographical regions, making it difficult to generalise findings. In addition, there needs to be more understanding of how adopting digital technology affects SMEs' performance in developing countries. This situation highlights the importance of conducting a systematic review to synthesise current research and understand the impact of digital technology adoption on SME performance outcomes in developing countries.

This study aims to fill a gap in the current literature by systematically reviewing SMEs' adoption of digital technologies in developing countries and their impact on performance metrics.

By synthesising existing research, this review provides knowledge into the impact of digital technology adoption in developing nations. The results of this review are of paramount importance for guiding policymakers, practitioners, and researchers regarding the enhancement and execution of digital transformation efforts in these countries.

Material and Methods

Research Design

This systematic review follows the guidelines outlined in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement by Moher, Liberati, Tetzlaff, and Altman (2009). The review aims to maintain methodological rigour, transparency, and comprehensiveness throughout the review process. The review adheres to the guidelines to standardise its methodology, including study selection, data extraction, synthesis, and reporting of results. This method increases the credibility and reliability of the review by reducing bias and promoting transparency in the selection and analysis of evidence.

Search Strategy

A systematic search was carried out on various electronic databases, including Scopus, Web of Science, and Google Scholar, utilising specific keywords like "digital technology adoption," "SME performance," and "developing countries." Boolean operators were employed to refine the search. The search spanned from December 2017 to December 2023.

Study Selection

The study used key terms and Boolean operators 'OR' and 'AND' to search comprehensively for relevant studies from various sources. 'OR' was used to broaden the search and capture variations of keywords, while 'AND' was used to narrow down results by requiring the simultaneous presence of multiple terms. This ensured a thorough and focused investigation, optimising the retrieval of pertinent literature while minimising the likelihood of overlooking relevant studies.

Two reviewers assessed titles and abstracts against inclusion criteria to ensure an unbiased selection process, enhancing objectivity and mitigating potential conflicts of interest. Their involvement improved the consistency and quality of research assessments by providing different perspectives and validating findings through rigorous peer review.

Eligibility criteria

All studies meeting the inclusion criteria were incorporated into this systematic review, with eligibility determined according to the following principles, ensuring alignment with the research objective and focus.

- Focus on the adoption of digital technologies by SMEs in developing countries.
- Empirically, it exhibits the impacts of adoption on various organisational performance indicators.
- Published in English.

- Period from 2017 to 2023

The study retrieved and reviewed articles that met the inclusion criteria for eligibility. Reviewer disagreements were resolved through consensus to ensure a unified and consistent approach to the selection process. Further, this approach fostered agreement and maintained the integrity of the review process.

Table 1: Eligibility Criteria for studies inclusion in the systematic review

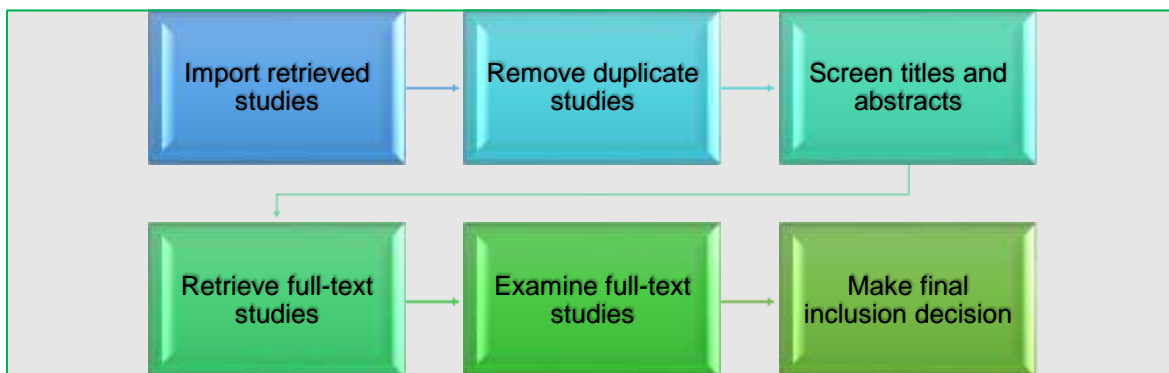
Sn	Criteria	Inclusion Decision	Exclusion Decision
1	Population	SMEs that adopted digital technologies	SMEs not adopted digital technologies
2	Condition	Impact on Performance Indicators	Impact on other indicators
3	Context	Developing Countries	Other Categories
4	Time	2013 - 2023	Before 2013 and after 2023
5	Studies	Observational Studies	Interventional studies

Source: Study Construction, 2024

Screening Process

In this study, the screening process involved identifying relevant literature on the adoption of digital technologies and their impact on SMEs in various developing countries. Initially, databases such as Scopus, Web of Science, and Google Scholar were searched using keywords related to digital technology adoption, SMEs, performance, and developing countries. Titles and abstracts of the retrieved studies were screened against predefined inclusion and exclusion criteria to identify potentially relevant articles. Subsequently, full-text assessments were conducted to determine the eligibility of the remaining studies based on their relevance to this study. Detailed documentation of the screening decisions was maintained throughout the process, and a PRISMA flow diagram was used to report the screening process results in the manuscript. This screening process is illustrated in Figure 1.

Figure 1: The systematic review's screening process for identifying eligible studies



Source: Study Construction, 2024

Figure 1 illustrates that the process of selecting eligible studies involves several stages. Firstly, the software imported the retrieved studies. Duplicate studies were then removed to ensure the dataset's integrity. Subsequently, titles and abstracts were screened based on predefined inclusion criteria. Following this initial screening, the full texts of all eligible studies were retrieved and examined in detail. A decision was made regarding including studies based on a thorough review of the full texts.

Data Extraction

The data was extracted using a standardised excel sheet form. The form recorded study characteristics, such as author(s), publication year, and country/region of origin, allowing for clear identification and categorisation. There were dedicated spaces to summarise critical findings related to adopting digital technology and its impact on performance outcomes, ensuring a systematic compilation of relevant data.

Data Synthesis and Analysis

The analysis of the included studies employed a narrative synthesis approach, following the guidelines outlined in the Synthesis Without Meta-analysis (SWiM) reporting framework (Campbell, McKenzie, Sowden, Katikireddi, 2020). Additionally, thematic analysis determined prevalent themes and patterns concerning the impact of digital technology adoption on the performance of SMEs in developing countries. This approach facilitated an exploration of the findings, allowing for identifying trends and insights within the research literature.

Quality Assessment

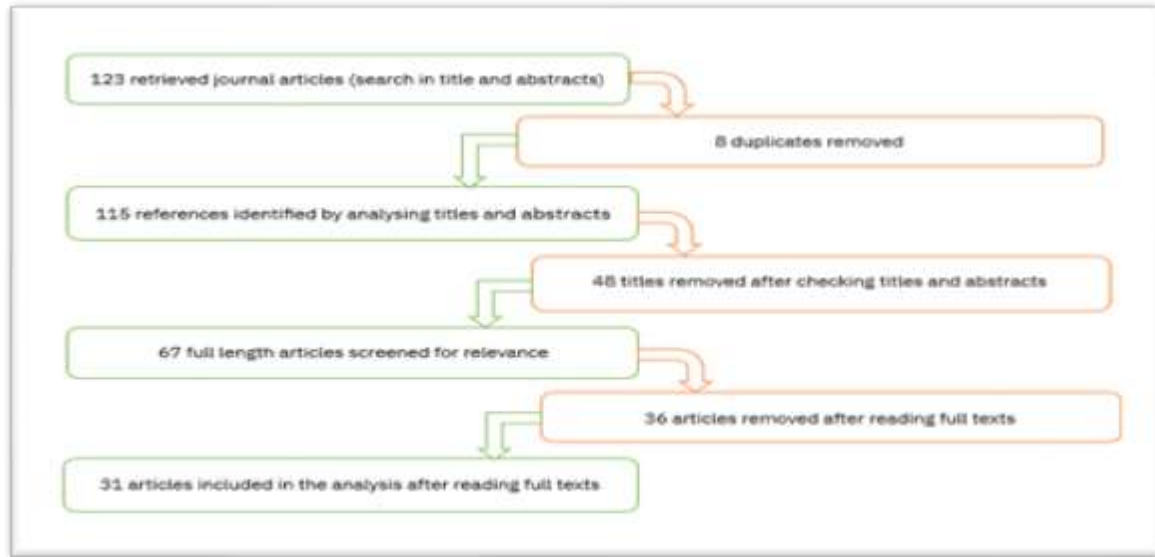
The assessment of study quality was conducted according to predetermined criteria, taking into account variables such as SMEs that have utilised digital technologies. These studies examine the impact of digital technology adoption on performance outcomes, with research carried out in developing nations between 2017 and 2023.

Results

Search Result and Selection Process

A systematic search was carried out on various electronic databases, including Scopus, Web of Science, and Google Scholar, utilising specific keywords like "digital technology adoption," "SME performance," and "developing countries." Boolean operators were employed to refine the search. The process is illustrated in Figure 2 as follows. The initial search identified 123 articles that were potentially relevant to the study. After eliminating duplicates and screening titles and abstracts, 57 articles were selected for full-text review. Of these, 31 studies met the predetermined inclusion and exclusion criteria and were deemed eligible for inclusion in the analysis. The two independent reviewers performed the selection process and agreed on double-edged decisions.

Figure 2: Screening process for articles used in the systematic review



Source: Study construction, 2024

In the systematic screening process, as illustrated in Figure 1, an initial search yielded 123 journal articles through a targeted exploration of titles and abstracts. Subsequent deduplication efforts removed eight duplicate entries, resulting in 115 unique references. A thorough examination of titles and abstracts led to the exclusion of 48 articles irrelevant to the study's focus. The remaining 67 articles underwent a comprehensive review of their full texts to ascertain their suitability for inclusion. Following this rigorous evaluation, 36 articles were deemed incompatible with the predetermined criteria and consequently excluded. Ultimately, 31 articles were selected as pertinent to the research focus and underwent further analysis. This screening process ensured the inclusion of only the most relevant and high-quality literature for the subsequent synthesis and interpretation of findings.

Descriptive summary of results

The included studies spanned a wide range of publication years, from 2017 to 2023, reflecting the growing interest in the impact of the adoption of digital technologies on SME performance in developing countries. Geographically, the studies encompassed diverse geographical regions, including Asia, Africa, and Latin America, reflecting the global nature of SMEs and the adoption of digital technology. The thematic scope of the studies encompassed various aspects of SME performance, including financial and operational metrics, innovation, competitiveness, and other outcomes, as presented in a subsequent section.

Results and Discussion

The present study utilises a narrative synthesis approach to examine the effects of digital technology adoption on small and medium enterprises (SMEs) in developing nations. Findings from multiple studies indicate that adopting digital technology can significantly enhance SME

performance across a range of metrics. Results are organised thematically and discussed within sections 3.3.1 to 3.3.5.

Business performance and growth of MSEs

Hoang and Le Tan (2023), Olomu, Binuyo and Oyebisi, (2023), and Zhe and Hamid (2021) show the transformative potential of digitalisation in improving operational efficiency, productivity, and broader business performance. These findings emphasise the strategic importance of investing in digital capabilities to drive sustainable growth and competitiveness for SMEs, regardless of geographical location. Furthermore, research by Lukonga (2020), Cusolito, Lederman, and Peña, 2020, and Ajimas (2024) support the vital role of digital technology adoption in boosting productivity, optimising resource utilisation, and fostering resilience in the face of economic uncertainties. By leveraging digital tools, SMEs can streamline operations, enhance supply chain management, and capitalise on new market opportunities, driving business growth and sustainability.

Moreover, studies by Lutfi, Alkelani, Al-Khasawneh, and Alshira'h, (2022), Vrontis, Chaudhuri, and Chatterjee, (2022), Surahman, Zhikry, Adi, and Yudaruddin (2023) highlight the strategic importance of digital transformation in improving customer engagement, satisfaction, and overall business performance. Through the strategic use of digital technologies, SMEs can improve customer interactions, build brand loyalty, and gain a competitive edge in the marketplace, ultimately contributing to long-term growth and success. Apart from that, studies by Bogavac, Čekerevac and Prigoda, (2021), Widyaningrum, Raharjo and Nuzula, (2017), Busaidi, Bhuiyan and Zulkifli, (2019) highlight the positive relationship between digital technology adoption and financial performance among SMEs. By adopting digital transformation strategies, SMEs can improve key financial metrics such as revenue growth, profitability, and market share, enhancing their performance and competitiveness in the digital marketplace.

Market performance and survival of SMEs

Solomon, Allen and Wangombe (2023), and Khalil, Abdelli, and Mogaji (2022) emphasise how digital technologies enable SMEs to improve their market performance and resilience. Through digital transformation initiatives, including adopting advanced technologies and organisational restructuring, SMEs can adapt to changing market dynamics, improve operational efficiency, and gain a competitive edge. These studies highlight the role of digitalisation in fostering greater connectivity, collaboration, and knowledge sharing, enabling SMEs to overcome challenges and seize opportunities for growth and sustainability in dynamic market environments.

Similarly, Mariska (2018) note the positive impact of digital technology adoption on SMEs' market performance and survival. By adopting information and communication technologies (ICTs) and comprehensive digital transformation strategies, SMEs can enhance their market presence, expand their customer base, and capitalise on new growth opportunities. These findings highlight the strategic importance of digitalisation in driving market performance and ensuring the long-term survival of SMEs in today's competitive business environment.

Operational, innovation, and financial performance

Shah, Zehri, Saraih, Abdelwahed, and Soomro (2024) explored the relationship between digital capability, direction, transformation, and innovation and showed how embracing digitalisation can improve SMEs' financial outcomes and innovation success. This demonstrates the strategic importance of using digital tools to drive innovation and improve financial performance, thereby positioning SMEs for long-term success in dynamic market environments. According to Sazkhya, Irene and Christanti (2023), the role of digital finance, payments, and marketing in enhancing SMEs' financial performance and competitiveness is another crucial factor. By leveraging digital technologies, SMEs can access innovative financial solutions, streamline payment processes, and effectively promote their products and services. Similarly, Anjum (2019) points to the strategic importance of digital marketing initiatives and innovation in driving SME growth and competitiveness. Through targeted marketing efforts and product innovation, SMEs can expand their market reach, differentiate their offerings, and capitalise on emerging trends.

Furthermore, Nijenhuis (2023), Teng, Wu, and Yang (2022), and Okello, Munene and Koech. (2023) have demonstrated that digitalisation is a crucial factor in driving operational effectiveness and financial success for SMEs. Nijenhuis emphasises the positive impact of digitisation on operational and financial outcomes, showing that embracing digital transformation can lead to productivity gains, cost efficiencies, and revenue growth for SMEs. Similarly, Teng et al. highlight the transformative potential of digital technologies to improve financial performance through digital transformation strategies and employee skill development. Furthermore, Okello et al. (2023) observe that mobile banking adoption significantly predicts SME financial performance, further demonstrating the importance of digital financial solutions in driving SME financial success.

Customer relationship, value creation and reputation

Olomu et al. (2023) emphasise the beneficial effects of adopting Internet-based technological innovations on enhancing customer relationships, product and service features, and the firm's reputation. Similarly, Nguyen, Pham and Phan (2023) shed light on the positive impact of digital transformation and innovation capabilities on customer value creation and operational outcomes in SMEs. These findings indicate the strategic importance of leveraging digital technologies to foster meaningful customer engagement and drive sustainable business growth.

Furthermore, Perera (2021) identifies the impact of IT technologies and digital tools on enhancing customer relationships and increasing business value. By strategically using digital platforms for targeted marketing and customer engagement initiatives, SMEs can develop customer relationships and enhance brand reputation in the marketplace. In addition, Arobo (2022) emphasised the strategic importance of digital marketing initiatives in driving SME growth and competitiveness. Through personalised digital marketing campaigns and online communication channels, SMEs can effectively engage with customers, address their needs, and build long-term loyalty, resulting in higher customer retention rates and increased sales.

In addition, Jamal (2023) underlines the crucial role of digital technologies in improving customer relationships and satisfaction among SMEs. Through the strategic use of social media platforms and online communication channels, SMEs can effectively engage with customers, address their needs, and build long-term loyalty. This improved customer satisfaction not only leads to higher retention rates but also contributes to increased sales and enhanced brand reputation, further emphasising the importance of customer-centric approaches to the growth and success of SMEs.

Sales, productivity, Profitability, and competitiveness

Seclen-Luna et al. (2022), and Sang (2023) emphasise the strategic importance of digitalisation in boosting SMEs' performance and resilience by pointing to the positive relationship between adopting digital technology and net sales and productivity. Amin, Suliyanto and Tabrani (2022) elucidate the noteworthy benefits of digital marketing, market orientation, and product innovation on the sales performance of small and medium-sized enterprises. These results emphasise how crucial it is for SMEs to implement digital initiatives to boost productivity and sales results.

Additionally, Anjum (2019) establishes the strategic importance of digital marketing campaigns in promoting the expansion and competitiveness of small and medium-sized enterprises. SMEs can improve their profitability and market positioning using digital platforms for focused marketing and market intelligence collection. This allows them to broaden their market reach, set themselves apart from competitors, and take advantage of emerging trends. Furthermore, Lukonga (2020) shows how digital technology, especially in the MENAP nations, might improve SMEs' productivity and growth trajectories. This demonstrates how digitisation has a revolutionary effect on market expansion tactics and business operations, empowering SMEs to achieve sustainable growth in the face of economic uncertainty.

Jamal (2023) also emphasise how digital technology can raise SMEs' sales, productivity, and profitability. SMEs can achieve significant gains in crucial financial KPIs, save operating costs, and optimise business operations through digital tools and creative financial solutions. As a result, SMEs can become more competitive, profitable, and long-term sustainable in dynamic market situations by implementing digital transformation efforts and digital marketing strategies.

Conclusion

The present study's findings show the significant impact of digital technology adoption on developing countries' SMEs, highlighting its transformative potential across various aspects of business operations and performance. From enhancing operational efficiency and productivity to driving innovation, financial success, and customer engagement, adopting digital technology emerges as a critical enabler for SMEs seeking sustainable growth and competitiveness in dynamic market environments. These results emphasise the strategic imperative for SMEs to embrace digital technology adoption initiatives and invest in digital capabilities to remain agile, resilient, and responsive to evolving market landscapes.

Limitations

Despite the valuable information provided by this study, there are acknowledged limitations. Publication bias may be present, as studies with positive results are more likely to be published. The quality of the included studies varied, potentially impacting the strength of the findings. Furthermore, the studies included in this analysis may have limited generalizability due to their specific geographic and sectoral focus. Furthermore, while the research shows the positive effects of the adoption of digital technology, it may overlook potential challenges or unintended consequences, such as cybersecurity threats or digital divide issues. Subsequent research should overcome these constraints by conducting thorough and stringent analyses.

Implications for Policy and Practice

The results of this systematic review have substantial implications for policymakers and practitioners in fostering small and medium-sized enterprise (SME) growth in developing nations. Policymakers must focus on promoting the adoption of digital technology among SMEs, which includes offering training, resources, and infrastructure support. Additionally, policymakers should work towards creating a conducive environment for digital entrepreneurship by implementing regulatory changes and providing financial incentives. It is paramount that practitioners utilise digital technologies such as e-commerce, digital marketing, and data analytics to improve the performance of small and medium-sized enterprises (SMEs). By adopting digital transformation, SMEs can strengthen their competitiveness and resilience within a progressively digital economy.

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