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DIGITAL INNOVATION IN THE FINANCIAL MANAGEMENT OF SMES: A LITERATURE REVIEW

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Abstract
The study analyses the challenges faced by small and medium-sized enterprises (SMEs) in the adoption of digital technologies for the optimization of their financial management. Through a literature review, an exhaustive search was carried out in the Scopus and Scielo databases, selecting 26 relevant studies. The findings reveal that most research takes a quantitative approach and highlights the positive impact of digitalization on operational efficiency, cost reduction, and access to financing. However, significant barriers are identified, such as scarcity of resources, lack of training, and organizational resistance to change. To address these challenges, the implementation of technological investment strategies, training programs for human talent, and government support policies is recommended. The integration of digital tools and innovative financial models is emerging as a determining factor to strengthen the competitiveness and sustainability of SMEs in a highly digitalized economic environment.

Keywords: Digital innovation, financial management, SMEs, digital transformation, Fintech.

Introduction

Digital innovation in small and medium-sized enterprises (SMEs) faces several obstacles that hinder its adoption and exploitation. A significant challenge confronting SMEs is the scarcity of financial resources, which impedes their capacity to invest in advanced technology and digital tools. Additionally, leaders and employees often exhibit resistance to change, which hinders the implementation of novel technological solutions. A paucity of personnel with training in digital technologies constitutes a challenge as well, given its effect on the optimal use of available tools. Likewise, insufficient technological infrastructure and a lack of system integration contribute to operational inefficiency. These challenges are further exacerbated by the rapid pace of change in the digital landscape, which necessitates ongoing updates from SMEs. Overcoming these obstacles necessitates increased investment in training, access to financing, and the establishment of a conducive environment for technological innovation.

On a global scale, small and medium-sized enterprises (SMEs) encounter substantial obstacles when it comes to adopting digital innovations, primarily due to a deficiency in both resources and knowledge. In this regard, the World Bank (2023) has noted that only approximately 30% of SMEs globally utilize advanced digital tools, such as process automation or artificial intelligence. In developed countries, this figure can reach up to

50%. However, in developing economies, this proportion is reduced to less than 15%. Concurrently, Jiang et al. (2022) emphasize that a significant proportion of entrepreneurs regard the absence of digital training as a primary impediment to the integration of novel technologies. Gu et al. (2023) further emphasize that a dearth of financial resources constitutes a salient impediment, with approximately 35% of SMEs reporting insufficient capital to invest in innovation.

A similar situation is observed in Latin America, where the adoption of digital innovation in SMEs remains limited, thereby adversely impacting the competitiveness of companies. In this regard, the Inter-American Development Bank (2022) indicates that in the region, only 20% of small and medium-sized enterprises have implemented digital tools to improve their processes and services. Conversely, the Inter-American Development Bank (2023) has cautioned that a significant proportion of companies in pivotal sectors such as trade and manufacturing continue to adhere to conventional methodologies. This hinders their capacity to contend with large, digitally mature enterprises. In a similar vein, Petrona (2025) emphasizes that less than 25% of SMEs have adopted e-commerce technologies or business management systems, underscoring the absence of digital infrastructure and the considerable expense of these technologies as the predominant impediments to digitization.

In Peru, the adoption of digital innovation by SMEs is of particular concern. According to the Ministry of Production (2024), only 18% of small and medium-sized enterprises in the country have incorporated some digital technology into their operations, and more than 70% continue to use manual methods. In a similar vein, Flores and Flores (2024) contend that in sectors such as services, a mere 12% of companies have adopted digitalization, and in industry, this figure does not exceed 15%. According to the Ministry of Production (2024), 65% of Peruvian SMEs identify the cost of digital technology as a key barrier to its adoption. Despite the existence of support programs, such as financing for digital transformation, adoption remains low due to a lack of training and resistance to change within companies.

Leguizamón (2024) found that 75% of the companies surveyed required unbudgeted technological investments for the implementation of electronic operations, indicating a need for enhanced financial planning. Furthermore, he determined that digitalization has enhanced the accounting and financial efficiency of SMEs. However, he also noted that barriers such as a lack of training and technological support persist. In a similar vein, Peñaloza and Córdova (2024) identified that the adoption of innovative technologies has led to a reduction in operating costs. They further emphasized that companies that foster a culture of innovation achieve higher levels of sustainability and competitiveness. In a complementary manner, Gu et al. (2023) demonstrated that the inclusive digital finance index is positively correlated with the increase in patent applications and R+D spending. They also found that these tools increase the financial autonomy of SMEs by reducing their dependence on traditional intermediaries. In their study, Fonseca Pinto, Fonseca, and Meo (2024) noted that, while 78.65% of SMEs have internet access, only 33.71% utilize advanced management software, indicating a substantial disparity in technological adoption. Concurrently, Musa and Njeru (2023) appraised the repercussions of online loans, concluding that these instruments engender a favourable and substantial influence on business profitability ($p = 0.042$). They further elucidated that a comprehensive financial administration that amalgamates digital instruments with conventional methodologies is instrumental in enhancing the performance of SMEs. In this context, Rojas et al. (2022) analysed financial autonomy in a poultry company and found that it was reduced by 23% due to increased indebtedness, which observed the need for more

rigorous strategic planning. Finally, Luján et al. (2023) reported that in Mexico, 70% of SMEs that invested in advanced technologies improved their competitiveness, which established the importance of government policies that promote a sustainable digital transformation.

As Flores and Flores (2024) have indicated, the issue of digital innovation in SMEs stems from a dearth of resources and knowledge necessary for the implementation of advanced technologies, thereby impeding their competitiveness and growth within a progressively digitized market. Concurrently, the Ministry of Production (2024) elucidates that small and medium-sized enterprises encounter challenges in acquiring affordable technological solutions and adapting their processes to the evolving demands of the digital landscape, which impedes their operational efficiency and hinders their capacity to attract new customers. In this context, the overcoming of these barriers necessitates the promotion of support policies, technology training, and digitalization strategies that drive the transformation of SMEs.

The article addresses the issue of digital innovation in SMEs, emphasizing its pertinence in the contemporary context of technological transformation. The objective of this study is to examine the challenges encountered by these companies in adopting digital technologies, with the aim of identifying solutions that facilitate their integration in an effective and sustainable manner. The significance of this subject is predicated on the notion that digital innovation constitutes a pivotal element in the context of the competitiveness and growth of SMEs. This phenomenon enables SMEs to enhance their operational processes, optimize resource utilization, and gain entry to new markets. Nonetheless, a considerable number of these companies encounter impediments, including a paucity of knowledge, inadequate infrastructure, and insufficient financial resources, which collectively impede their ability to implement these technologies.

Theoretical background

The study is predicated on the assumption that theories of finance and financial management are fundamental to understanding how organizations make strategic decisions regarding the allocation and management of financial resources. In this sense, Sabry (2024) states that the theory of finance has its roots in the work of Harry Markowitz, who developed the efficient portfolio theory in the 1950s. In a similar vein, Guerard (2023) elucidates that Markowitz pioneered the notion of diversification and the utilization of mathematical models to enhance the risk-to-return ratio of investments. Conversely, Sabry (2024) asserts that his work established the foundations of modern financial theory, underscoring the significance of informed decisions regarding risk and return in financial markets. Furthermore, Goetzmann (2023) contends that as finance theory progressed, alternative approaches, such as the asset valuation model and the efficient markets hypothesis, were integrated, enabling investors and corporations to adopt more sophisticated strategies to optimize their profits. In the contemporary business landscape, financial theory plays a pivotal role in decision-making processes within organizations, offering indispensable tools for the management of investments and the analysis of risk.

Concurrently, Aisyah (2024) has indicated that the theory of financial management has been profoundly influenced by the works of Franco Modigliani and Merton Miller, who in the 1950s developed the theory of the value of the firm. In a similar vein, Martins et al. (2021) posit that Modigliani and Miller contended that, in a hypothetical perfect market, a firm's value is independent of its capital structure, contingent instead on its capacity to generate revenue. In a similar vein, Cardao-Pito (2021) has demonstrated that this approach has the potential to challenge conventional notions concerning the

significance of debt in the financing of companies, thereby promoting a perspective that encompasses the benefits and costs associated with financial decisions. Furthermore, Stulz (2022) asserts that financial management has evolved into a more intricate discipline, encompassing financial risk analysis, treasury planning, and capital optimization strategies. Finally, Martins et al. (2021) emphasize that financial management currently plays a pivotal role in the sustainability and growth of organizations, being essential for the effective allocation of resources and the maximization of business value. Theory and practice of financial management enables companies to make informed decisions that favor their stability and expansion in a dynamic economic environment.

Digital innovation is defined as the transformation of processes, products, and business models through the implementation of digital technologies. This transformation enables businesses to enhance their efficiency and competitiveness in the marketplace (Leguizamón, 2024). In the context of SMEs, this innovation is instrumental to their sustainability, though it encounters impediments such as a paucity of technological infrastructure and an aversion to change (Fonseca et al., 2024). The digitization of processes is an essential aspect of digital innovation, as it allows operational management to be optimized and productivity to be improved (Peñaloza & Córdova, 2024). In the financial sector, the implementation of digital platforms has facilitated access to credit and investment in R+D, thereby reducing economic restrictions for companies (Gu et al., 2023).

The impact of digital innovation on companies varies depending on their level of development and technological capabilities (Leguizamón, 2024). Process innovation, on the other hand, entails the enhancement of internal operations through the utilization of digital tools. Conversely, product innovation entails the incorporation of novel technologies to provide diversified goods and services (Musa & Njeru, 2023). Furthermore, the advent of innovation in business models has been shown to effect a transformation in the organizational structure of companies, thereby enabling them to adapt to digital environments (Almeida, 2022). Within the spectrum of innovation, three distinct categories emerge: incremental, disruptive, and sustainable. These categories exhibit varying degrees of impact on the evolution of business sectors (Leguizamón, 2024). In this context, companies that adopt disruptive innovation have the potential to generate significant changes in their industry and compete on equal terms with large corporations (Peñaloza & Córdova, 2024).

The advent of digital technologies has facilitated the enhancement of economic management in SMEs. However, these enterprises continue to grapple with challenges, including a paucity of training in the utilization of digital instruments (Fonseca et al., 2024). Quantitative analyses have identified a positive correlation between the adoption of digital platforms and enhanced operational efficiency in 70% of companies that have undergone digital transformation (Luján et al., 2023). In qualitative terms, access to digital financing has been shown to reduce dependence on financial intermediaries and to grant companies greater autonomy in the management of their resources (Gu et al., 2023).

The field of financial auditing has also undergone significant changes in response to digital transformation, as the integration of emerging technologies has led to substantial improvements in process security and risk detection (Peñarrieta et al., 2024). Nevertheless, obstacles such as a paucity of regulation and the necessity of training in advanced digital tools persist (Rojas et al., 2022). Digital innovation has been demonstrated to be a primary factor in the competitiveness of companies. However, its implementation necessitates strategies that enable the successful navigation of

technological and financial challenges (Petrona, 2024). Consequently, the integration of digital innovations signifies a pivotal opportunity for the growth and sustainability of companies, contingent upon the implementation of effective strategies to surmount prevailing barriers (Kwan & Alegre, 2024).

Financial management can be defined as the process by which a company's economic resources are planned, managed, and controlled to ensure its stability and sustainability (Leguizamón, 2024). This process encompasses a range of activities, including cash flow optimization and the evaluation of strategic investments that enhance the profitability and competitiveness of the organization (Musa & Njeru, 2023). In the context of SMEs, financial management faces a myriad of challenges, including constrained access to financing, an absence of structured planning, and the dearth of advanced digital tools for decision-making (Fonseca et al., 2024).

Financial planning constitutes a pivotal element of financial management, as it facilitates the anticipation of economic requirements and the efficient allocation of resources, thereby ensuring the business's sustainability (Rojas et al., 2022). This process involves the formulation of budgets, the projection of income and expenses, and the analysis of financial statements to evaluate the economic performance of the company (Peñarrieta et al., 2024). Quantitative research has demonstrated that companies that implement rigorous financial planning strategies experience a substantial reduction in debt levels and enhancement in long-term profitability (Flores-Ramírez & Flores-Ruiz, 2024).

One of the most salient aspects of financial management is the integration of digital tools, as they facilitate the efficient management of resources and improve strategic decision-making (Jiang et al., 2022). In this context, Jiang et al. (2022) emphasize that the utilization of digital platforms and tools grounded in artificial intelligence enables companies to enhance their financing structures and augment their economic performance. However, it is important to note that factors such as the level of indebtedness and shareholder concentration can influence the impact of these tools on financial performance.

Financial management in SMEs faces additional challenges, such as a lack of trained personnel and resistance to change in the adoption of digital tools (Petrona, 2024). According to Flores-Ramírez and Flores-Ruiz (2024), financial planning has been identified as a critical factor in ensuring the economic stability of private educational institutions. This planning enables the optimization of operating costs and the enhancement of profitability. A quantitative analysis of the financial data of educational companies has revealed a correlation between structured management and reduced levels of indebtedness, as well as enhanced efficiency in resource allocation (Flores-Ramírez & Flores-Ruiz, 2024).

In the operational field, financial management encompasses working capital management, investment planning, and economic risk assessment (Rojas Hernández et al., 2022). To ensure efficient management, reliable and timely financial data is necessary, which allows evidence-based decisions to be made and liquidity problems to be avoided (Peñarrieta et al., 2024). However, many microenterprises still lack long-term financial strategies, which hinders their growth and adaptation to changes in the market (Petrona, 2024).

In this sense, financial management is an essential component of business sustainability, as it optimizes the use of resources, reduces costs, and improves economic stability. A comprehensive review of the extant literature reveals that structured planning, financial statement analysis, and the integration of digital tools have proven to be

effective strategies to improve the profitability and competitiveness of companies (Jiang et al., 2022). However, challenges such as limited access to financing and lack of training persist, which necessitates the development of more efficient management strategies adapted to the needs of each sector (Flores-Ramírez & Flores-Ruiz, 2024).

Method

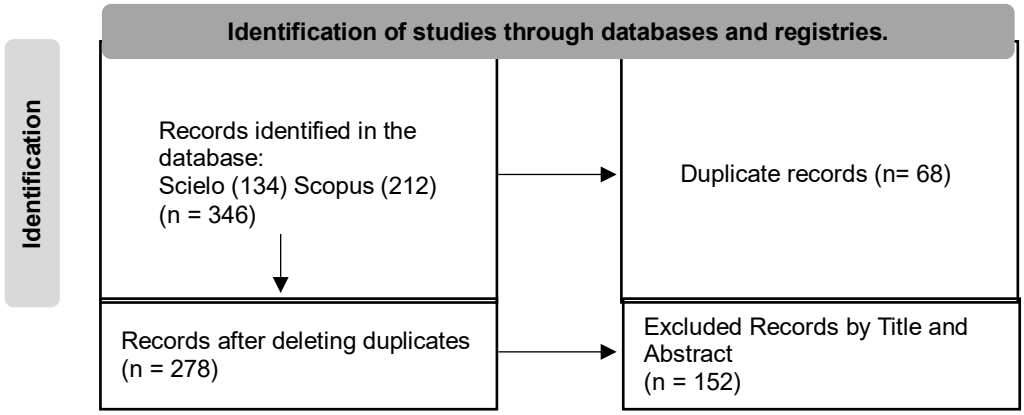
This study is a literature review, it is a compilation and analysis of previous studies related to the topic, for which an exhaustive search was carried out in order to synthesize in a clear and precise way the search and selection of studies.

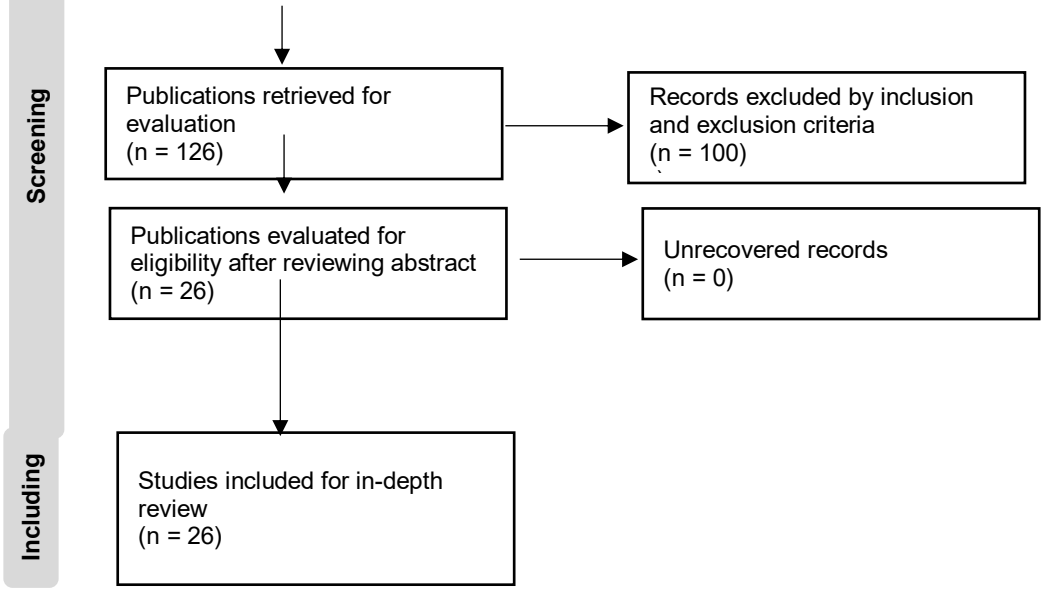
The research seeks to analyse the challenges faced by these companies to adopt digital technologies that help them find solutions that facilitate their integration in an effective and sustainable way.

The present study focuses on small and medium-sized enterprises (SMEs) as the target population. For the purposes of the literature review, the following academic publications were included: articles in indexed journals, empirical studies, and experimental studies. Conversely, editorial comments, reviews, and non-peer-reviewed studies were excluded. The thematic selection focused on articles addressing digital innovation in the financial management of SMEs. In this analysis, a comprehensive review of articles of various methodological types was conducted, encompassing quantitative studies (n=15), qualitative studies (n=4), mixed studies (n=2), and literature reviews (n=5), as delineated in Table 1. The time period encompassed by the search was from 2020 to 2024, and the studies selected were required to be written in English or Spanish.

The search strategy was implemented in the Scopus and Scielo databases, recognised for their high quality and broad access to peer-reviewed academic literature. This guarantees the robustness and validity of the information collected for this review. The utilisation of these sources enabled a thorough and efficient search, leading to the identification of pivotal studies on digital innovation in SME financial management. The search was conducted using the following key terms: "digital innovation," "financial management," "SMEs," "technological transformation," "operational efficiency," "financial automation," "digital finance," and "business competitiveness." A search algorithm was implemented that combined these terms using Boolean operators AND and OR to ensure comprehensive coverage of the relevant literature, as specified below: The following search terms were employed: 'digital innovation' AND 'financial management' AND 'SMEs'; 'digital innovation' OR 'financial management' OR 'SMEs'; 'digital innovation' AND 'financial management' AND ('SMEs'); 'digital innovation' AND 'SMEs' AND ('FINANCIAL MANAGEMENT'); 'financial management' AND 'SMEs' AND ('DIGITAL INNOVATION'); 'financial management' AND ('digital innovation' OR 'SMEs')

Figure 1. PRISMA flow of journal articles through the systematic review process





The selection process for the study was conducted in two stages. Initially, a selection was made based on a review of titles and abstracts, followed by a full review of the text of the preselected articles. The relevance of each study was determined using specific criteria defined for this purpose. Finally, to transparently document the selection of studies included in this literature review, the PRISMA flow diagram was used as a supporting tool after the exhaustive process of identifying and analysing the articles.

In total, 346 studies were identified (212 from Scopus and 134 from Scielo). After grouping the results and eliminating 68 duplicates, a total of 278 publications were used. After reviewing the abstracts of the 278 filtered publications, 126 articles were selected for the final evaluation, then the inclusion and exclusion criteria were applied to filter the studies, excluding 100 studies that did not meet the criteria, leaving 26 for the final analysis.

After applying the criteria, 26 complete publications were selected for systematic analysis, as shown in Table 1.

Table 1. Characteristics of the identified items

N°	Author	Article Title	Methodology	Country	Year	Database
1	Vargas, A. (2021)	Digital banking: technological innovation in financial inclusion in Peru.	Quantitative	Peru	2021	Scielo
2	Alvarado, K., & Campodónico Durango, G. (2023)	Analysis of Fintech and its contribution to the development of SMEs in Guayaquil – Ecuador.	Quantitative	Ecuador	2023	Scielo
3	Arguello et al. (2021)	Business technology for SMEs, a competitiveness	Mixed	Ecuador (Riobamba)	2021	Scopus

		strategy in times of pandemic.				
4	Townsend, J., & Figueroa, J. (2022)	Digital transformation models in the management of commercial companies.	Qualitative	Ecuador	2022	Scopus
5	Benavides, L. E., & Bolaños Delgado, S. L. (2020)	Innovation barriers in SMEs: an approach through a systematic literature review.	Systematic review	Colombia	2020	Scopus
6	Cuba, A. E., & Cardenas, C. R. (2024)	Digital transformation and financial management in hospital administration in a public health institution, 2023.	Qualitative	Peru	2023	Scielo
7	Florez, P., & Florez, H. (2024)	Innovation in business administration models: Literature review.	Systematic review	Unspecified	2024	Scopus
8	Testa, G. L., & González, J. C. (2024)	Technological platforms for productive development: main results of a comparative study at the national and international levels.	Quantitative	Chile	2024	Scielo
9	Méndez-Gutiérrez, X. M., Valiente-Saldaña, Y. M., Mantilla-Sevillano, J. E., & Gonzales-Rentería, Y. G. (2023)	Impact of digital transformation on the business management of human talent consulting companies, Trujillo – Peru.	Quantitative	Peru	2023	Scielo
10	Tipán Masaquiza, A., & Abril Flores, J. F. (2024)	Financial management model for decision-making in microenterprises in Ambato-Tungurahua.	Qualitative	Ecuador	2024	Scielo
11	Catagua, M.L., Pinargote Macías, M.F., & Mendoza Vinces, M.E. (2023)	Internal control and COSO model in business administrative and financial management.	Quantitative	Ecuador	2023	Scielo
12	Figueiro, P. J., & Sánchez, M. S. (2023)	Digital financial platforms, own money	Qualitative	Argentina	2023	Sopus

		and autonomy. An analysis.				
13	Jiménez-López, N. R., Valiente-Saldaña, Y. M., de-la-cruz-Ruiz, N. V., & Zavala-Benites, E. F. (2023)	Entrepreneurship culture of micro and small enterprises in Peru.	Systematic review	Peru	2023	Scielo
14	Babilla, T. U. K. (2023)	Digital innovation and financial access for small and medium-sized enterprises in a monetary union.	Quantitative	West African Monetary Union	2023	Scopus
15	Wang, J., & Qian, X. (2024)	Dynamics of digital finance and its impact on the financing of SMEs.	Quantitative	China	2024	Scopus
16	Moreira, L., Pinto, S., Costa, L., Araújo, N. (2025)	Evaluation of digital transformation in small and medium-sized companies using the Alkire-Foster method.	Quantitative	Portugal	2025	Scopus
17	Radicic, D., & Petković, S. (2023)	The impact of digitalisation on technological innovations in small and medium-sized enterprises (SMEs).	Quantitative	Germany	2023	Scopus
18	Yanhong (2024)	The impact of digital finance on technological innovation throughout the life cycles of companies in China.	Quantitative	China	2024	Scopus
19	Clemente, J.A., Nicoara-Popescu, D., & Pastor-Sanz, I. (2024)	Digital transformation in SMEs: understanding its determinants and size heterogeneity.	Quantitative	Spain	2024	Scopus
20	Panchal, G., Clegg, B., Eslamian Koupaei, E., Masi, D., & Collis, I. (2024)	Digital transformation and business intelligence for an SME.	Mixed	United Kingdom	2024	Scopus
21	Gao, X. (2024)	Unlocking the Path to Digital Financial	Quantitative	China	2024	Scopus

		Accounting: A Study on Chinese SMEs and Start-ups.				
22	Faiz, F., Le, V., & Masli, E. K. (2024)	Determinants of the adoption of digital technologies in innovative SMEs.	Quantitative	Indonesia	2024	Scopus
23	Hermann, A., Gollhardt, T., Cordes, A.-K., von Lojewski, L., Hartmann, M. P., & Becker, J. (2024)	Digital transformation in SMEs: a taxonomy of externally supported digital innovation projects.	Systematic review	Germany	2023	Scopus
24	Skare, M., De las Mercedes de Obesso, M., & Ribeiro Navarrete, S. (2023)	Digital transformation and European small and medium-sized enterprises (SMEs).	Quantitative	Europe (in general)	2023	Scopus
25	Marino, J. A., Palos-Sánchez, P. R., & Velicia-Martín, F. (2024)	Evolution of digital transformation in the management of SMEs through a bibliometric analysis.	Systematic review	Spain	2024	Scopus
26	Merín-Rodrigáñez, J., Dasí, Á., & Alegre, J. (2024)	Digital transformation and business performance in innovative SMEs: the mediating role of innovation in the business model.	Quantitative	Spain	2024	Scopus

Results and discussion

The contributions of the articles analysed are presented below as a synopsis of articles pertaining to digital innovation in the realm of SME financial management (Table 1).

Table 2. Articles on Digital Innovation in SME Financial Management

Authors	**Purpose of the article**	**Applied digital innovation**	**Applied software**	**Types of SMEs analyzed**
Vargas, A. (2021)	To determine the relationship between digital banking and financial	Digital banking (apps and online services)	Digital management of financial services	SMEs from different functional areas

	inclusion in Peru (2010-2019).			
Alvarado, K., & Campodónico, G. (2023)	To analyse how fintechs contribute to the development of SMEs in Guayaquil.	Fintech Services	Payment channels, collection management and access to financial products	SMEs from various economic sectors in Guayaquil
Arguello et al. (2021)	To measure the use and impact of ICT in SMEs in Riobamba.	Process automation software	Accounting and cash flow management software	SMEs from different functional areas
Townsend, J., & Figueroa, J. (2022)	Assess the readiness of business enterprises for digital transformation.	Process Digitalization, Data Analytics, and Management	Accounting and cash flow management software	SMEs in the trade sector (supermarkets)
Méndez-Gutiérrez, X. M., Valiente-Saldaña, Y. M., Mantilla-Sevillano, J. E., & Gonzales-Rentería, Y. G. (2023)	To determine the impact of digital transformation on the business management of human talent consulting companies in Trujillo, Peru.	Digital tools and digital channels	Accounting and cash flow management software	Human talent consulting companies
Benavides, L. E., & Bolaños, S. L. (2020)	Identify the barriers that affect the performance of the innovation process in SMEs.	Process Digitalization, Data Analytics, and Management	Accounting and cash flow management software	Diverse industries and geographical contexts
Cuba, A. E., & Cárdenas, C. R. (2024)	To analyse the relationship between digital transformation and financial management in hospital administration.	Big data, cloud computing, telemedicine, electronic medical records	Automation of accounting, invoicing, inventories and budgets	SMBs that use banking services
Florez Cardoso, P., & Florez Cardoso, H. (2024)	Identify trends, challenges and best practices to promote innovation in business management.	AI and data analytics for optimization and customer experience	Accounting and cash flow management software	SMEs in general

Testa, G. L., & González, J. C. (2024)	Compare technological platforms designed to promote the productive development of microenterprises.	Web analytics, chatbots, crowdfunding	Restricted access to financing, dependence on own resources	Micro
Méndez-Gutiérrez, X. M., Valiente-Saldaña, Y. M., Mantilla-Sevillano, J. E., & Gonzales-Rentería, Y. G. (2023)	To determine the impact of digital transformation on the business management of human talent consulting companies in Trujillo, Peru	Digitalization and use of electronic channels	Diagnosis, planning, control and financial evaluation	Human Talent Consultants
Tipán, A., & Abril, J. F. (2024)	To present a financial management model to facilitate decision-making in microenterprises	Process Digitalization, Data Analytics, and Management	Diagnosis, planning, control and financial evaluation	Micro
Catagua, M.L., Pinargote, M.F., & Mendoza, M.E. (2023)	Evaluate internal control in administrative and financial management using the COSO model	Process Digitalization, Data Analytics, and Management	Use of accounting and financial communication systems	Family business in decline
Figueiro, P. J., & Sánchez, M. S. (2023)	Analyze how digital financial technologies impact prisoners' autonomy	Digital financial platforms (virtual wallets)	Money management through financial apps	SMEs in general
Jiménez-López, N. R., Valiente-Saldaña, Y. M., de-la-cruz-Ruiz, N. V., & Zavala-Benites, E. F. (2023)	Analyze the culture of entrepreneurship and its key competencies in MSEs	ICT and digital applications for business	Not detailed, but mentions the need for financial support	Micro and small enterprises in Peru

Babilla, T. U. K. (2023)	Assessing the impact of digital innovation on the financial constraints of SMEs	Digital financial innovation for access to financial services	Inclusive banking and digital platforms	Small and medium-sized enterprises in the West African Monetary Union
Wang, J., & Qian, X. (2024)	Analyse the evolution of digital financial networks and their impact on SME financing	Blockchain and cloud computing	Long-term microcredits and transmission of financial information	SMEs in China
Moreira, L., Pinto, S., Costa, L., Araújo, N. (2025)	Analyze the integration of digital technologies in SMEs	Autonomous robots, 3D printing, IoT	Digitized accounting and efficient reporting	Metalworking industry in Portugal
Radicic, D., & Petković, S. (2023)	To analyse how digitalisation influences innovation in SMEs, with an emphasis on R+D	Digitalization in production, logistics, digital value chains and big data	Digitized accounting and efficient reporting	Micro, small and medium-sized enterprises in manufacturing and services (Germany)
Yanhong (2024)	Analyze how digital finance affects technological innovation in Chinese companies	Online banking, digital financial tools, payment platforms	Digital Financial Management for Optimization and Financing	Publicly traded companies in China (may include SMEs)
Clemente, J.A., Nicoara-Popescu, D., & Pastor-Sanz, I. (2024)	Identify the determinants of digital transformation in SMEs and the impact of their size.	Digital transformation for operational efficiency and innovation	Digitized accounting and efficient reporting	SMEs in Spain
Panchal, G., Clegg, B., Eslamian Koupaei, E., Masi, D., & Collis, I. (2024)	Explore how SMEs can implement digital transformation with a systemic approach.	Industry 4.0 and the digital twin	Digitized accounting and efficient reporting	SMEs in the manufacturing sector
Gao, X. (2024)	To analyze the factors that affect the digitization of financial	Digitizing Financial Accounting with ICT	Digitized accounting and efficient reporting	SMEs listed on the Chinese stock market

	accounting in SMEs and startups.			
Faiz, F., Le, V., & Masli, E. K. (2024)	Identify key factors in the adoption of digital technologies in SMEs.	Adoption of digital technologies	Strategy for allocating resources to digital transformation	Innovative SMEs
Hermann, A., Gollhardt, T., Cordes, A.-K., von Lojewski, L., Hartmann, M. P., & Becker, J. (2024)	Develop a taxonomy to classify digital innovation projects in externally supported SMEs.	Externally supported digital technologies	Strategy for allocating resources to digital transformation	German SMEs in digital innovation projects
Skare, M., De las Mercedes de Obesso, M., & Ribeiro Navarrete, S. (2023)	Analyse the impact of digital transformation on SMEs' business activities, highlighting opportunities and threats.	Digital transformation in business strategies and innovation	Access to external financing	European SMEs
Marino, J. A., Palos-Sánchez, P. R., & Velicia-Martín, F. (2024)	Identify sources, authors and trends in research on digital transformation in SMEs.	Digital Capabilities for Digital Transformation	Strategy for allocating resources to digital transformation	SMEs in general
Merín-Rodrigáñez, J., Dasí, Á., & Alegre, J. (2024)	Explore how digital transformation influences the performance of innovative SMEs through business model innovation.	Digitalization of processes for operational optimization	Strategy for allocating resources to digital transformation	Innovative SMEs with the "Innovative SME" seal

A close reading of the articles reveals a variety of approaches in terms of research purpose. A considerable body of research has been dedicated to examining the relationship or impact of digital innovation (e.g., digital banking, fintech, process automation, digital transformation, and digital tools) on various dimensions of SMEs, including financial inclusion, business development, ICT use, business management, and

innovation performance. A multitude of studies are underway to identify barriers, assess the level of readiness for digital transformation, analyze trends and best practices, compare technology platforms, and develop financial management models.

A broad array of technologies and services is evident in the realm of applied digital innovation. Digital banking and fintech services are pertinent in the context of financial inclusion and development. The integration of process automation, digitization, and data analytics has emerged as a pivotal strategy to enhance operational efficiency and management. Additionally, more specific technologies such as big data, cloud computing, telemedicine, artificial intelligence, web analytics, chatbots, crowdfunding, blockchain, IoT, and Industry 4.0 are mentioned.

The software applied in the financial management of SMEs focuses on the digital management of financial services, payment channels, collection management, access to financial products, accounting and cash flow software, automation of accounting processes (billing, inventories, budgets), and financial communication systems. The utilization of instruments for the purposes of diagnosis, planning, control, and financial evaluation is also emphasized.

The SMEs examined in this study are diverse, ranging from SMEs in different functional areas and economic sectors (Guayaquil, Riobamba) to specific sectors such as commerce (supermarkets), human talent consulting (Trujillo), hospital administration, and the metallurgical industry (Portugal). In addition, the text contains analyses of microenterprises, family businesses in decline, SMEs that use banking services, innovative SMEs, SMEs listed on the Chinese stock exchange, and SMEs in specific geographical contexts, including Peru, the West African Monetary Union, China, Germany, and Spain. It is noteworthy that certain studies do not specify the type of SME under consideration, refer to SMEs in general, or focus on European SMEs.

The table indicates a substantial interest in understanding how digital innovation is transforming the financial management of SMEs into various geographical and sectoral contexts, using a variety of digital tools and technologies. The objective of these studies is twofold: firstly, to quantify the impact of this digital transformation, and secondly, to identify the factors that influence its adoption and outcomes.

Digital transformation and access to finance

In the context of digital transformation and access to finance, various studies have analysed the impact of digitalization on the financial sector and its role in the inclusion of small and medium-sized enterprises (SMEs). Vargas (2021) discovered that digital banking in Peru has had a positive effect on access to bank accounts, thereby facilitating financial inclusion in historically underserved sectors. In a similar vein, the author noted that the digital transformation in banking has enabled SMEs to access more efficient financial services that are tailored to their needs, thereby contributing to their economic sustainability. In a complementary manner, Alvarado and Campodónico (2023) demonstrated that Fintech has played a pivotal role in enhancing financing for SMEs, particularly in emerging economies such as Ecuador. In Ecuador, over 75% of the surveyed companies have adopted Fintech services to optimize their liquidity and enhance the efficiency of their financial operations. In this context, it is emphasized that the advent of the novel Coronavirus (SARS-CoV-2) pandemic has precipitated the accelerated adoption of financial technology (Fintech) platforms, thereby engendering a marked increase in the digital transformation of the financial management of small- and medium-sized enterprises (SMEs). This phenomenon has concomitantly engendered

enhanced resilience in SMEs in the face of the global economic crisis (Alvarado & Campodónico, 2023).

Conversely, recent research has investigated the relationship between digital innovation and access to financing in the business environment. From a macroeconomic perspective, it has been demonstrated that digital innovation in the financial sector can alleviate the credit constraints encountered by SMEs within a monetary union, thereby enhancing their access to financing and fortifying their productivity (Babilla, 2023). Concurrently, the findings indicate that the digitization of finance has enabled the proliferation of digital financial networks, thereby facilitating the allocation of resources to SMEs through alternative financing platforms. This, in turn, has resulted in a reduction in constraints on access to credit (Wang and Qian, 2024). Furthermore, evidence suggests that digital transformation in financial accounting has been instrumental in attracting investment for SMEs in China. The adoption of digital tools has been shown to enhance transparency and reliability in financial management, which are fundamental elements for obtaining financing in competitive markets (Gao, 2024). In this sense, accounting digitalization is presented as a determining factor in the professionalization of SMEs, which in turn facilitates their access to credit and external financing (Gao, 2024).

Consequently, extant research has demonstrated that digital transformation has not only augmented access to financing for SMEs but has also led to the reconceptualization of their business models and growth strategies. Wang and Qian's (2024) seminal work underscored the pivotal role of digital financial inclusion in enhancing corporate liquidity and fostering innovation in business models. This, in turn, has the potential to boost competitiveness in global markets, thereby underscoring the significance of financial inclusion in promoting economic growth and development. In a similar vein, Babilla (2023) examined the impact of digital transformation on the development of more efficient financial ecosystems, resulting in a reduction of transaction costs and an optimization of financial resource allocation.

Conversely, it has been determined that the adoption of digital platforms has enabled SMEs to overcome structural barriers to financing, thereby enhancing their capacity for expansion and economic sustainability (Gao, 2024). In this sense, the advent of digital transformation has had a profound impact on the realm of finance, significantly enhancing access to financial resources on a global scale. This development has come to play a pivotal role in the evolution of the global business and financial ecosystem.

The impact of Fintech on SMEs

In the context of digital transformation and access to finance, various studies have analysed the impact of digitalization on the financial sector and its role in the inclusion of small and medium-sized enterprises (SMEs). Vargas (2021) discovered that digital banking in Peru has had a positive effect on access to bank accounts, thereby facilitating financial inclusion in historically underserved sectors. In a similar vein, the author noted that the digital transformation in banking has enabled SMEs to access more efficient financial services that are tailored to their needs, thereby contributing to their economic sustainability.

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Furthermore, evidence suggests that digital transformation in financial accounting has been instrumental in attracting investment for SMEs in China. The adoption of digital tools has been shown to enhance transparency and reliability in financial management, which are fundamental elements for obtaining financing in competitive markets (Gao, 2024). In this sense, accounting digitalization is presented as a determining factor in the professionalization of SMEs, which in turn facilitates their access to credit and external financing (Gao, 2024).

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Conversely, it has been determined that the adoption of digital platforms has enabled SMEs to overcome structural barriers to financing, thereby enhancing their capacity for expansion and economic sustainability (Gao, 2024). In this sense, digital transformation has been shown to enhance access to financing, thereby solidifying its role as a foundational element in the evolution of the global business and financial ecosystem. The impact of fintech on small and medium-sized enterprises (SMEs) has been the subject of analysis in various studies, addressing both the benefits and the challenges that its adoption entails. The importance of financial technologies in enhancing the competitiveness of SMEs, particularly during periods of crisis such as the ongoing pandemic, is underscored (Mendoza, 2021).

Concurrently, digital transformation in business management has been shown to promote process optimization and facilitate access to financing, thereby enhancing the sustainability of businesses in an increasingly dynamic market (Townsend & Figueroa, 2022). Conversely, the financial digitalization that has occurred has been shown to play a pivotal role in the reduction of economic barriers, thereby enabling SMEs to gain access to banking services and credit without the necessity of reliance on traditional institutions (Skare et al., 2023). In this sense, Fintech platforms are regarded as strategic allies in the evolution of business models, promoting operational efficiency and financial inclusion (Figueiro & Sánchez, 2023).

In a similar vein, it has been highlighted that fintechs have driven technological innovation within SMEs, allowing them to adapt to new consumption models and market needs (Yanhong, 2024). Consequently, the incorporation of digital instruments into financial administration has augmented the capacity of enterprises to respond to economic shifts and enhance their access to capital (Skare et al., 2023). Concurrently, studies have demonstrated that financial digitalization has enhanced cash flows and strategic decision-making, thereby exerting a favourable influence on the profitability and stability of businesses (Figueiro & Sánchez, 2023). Furthermore, it has been contended that digital transformation has not only facilitated the enhancement of financial management within SMEs but has concomitantly engendered novel prospects for expansion and internationalization (Townsend and Figueroa, 2022). Consequently, the implementation of Fintech solutions has led to substantial reductions in operating costs and enhancements in the efficiency of business processes (Mendoza, 2021).

Conversely, several challenges have been identified that hinder the adoption of financial technologies by SMEs. These include resistance to change, a lack of digital literacy, and the necessity of adequate technological infrastructure (Skare et al., 2023). In a similar vein, Figueiro and Sánchez (2023) underscored the significance of cybersecurity in fostering trust in Fintech services. Furthermore, Yanhong's (2024) observations indicate that certain companies continue to depend on conventional financial systems, which may impede the implementation of more advanced digital solutions. However, Townsend and Figueroa (2022) concluded that the incorporation of Fintech in the management of SMEs represents a significant opportunity to improve their efficiency, reduce costs, and access broader markets. In summary, Mendoza (2021) emphasized that digital transformation and the integration of fintech solutions remain pivotal in the evolution and sustainability of SMEs in the contemporary global economic landscape.

Financial automation to improve efficiency

Financial automation is a critical component of enhancing business management efficiency, particularly within the context of small and medium-sized enterprises (SMEs). Méndez-Gutiérrez et al. (2023) have indicated that digital transformation facilitates the optimization of financial processes, thereby allowing for more agile and structured access to critical data for decision-making. In a similar vein, Vargas (2021) underscored the positive impact of digitization on financial inclusion, asserting that it has served to reduce barriers to access and enhance the operational efficiency of businesses. In a similar vein, Testa and González (2024) have demonstrated that the implementation of technological platforms has been a pivotal mechanism for enhancing business productivity, thereby ensuring that microenterprises optimize their financial and commercial operations. Furthermore, it has been identified that the implementation of business intelligence models, founded upon digital systems, has the potential to enhance financial management and competitiveness in SMEs (Panchal et al., 2024).

Secondly, the integration of digital tools in financial management allows for more rigorous control of resources, ensuring greater profitability and stability in microenterprises. Berrocal et al. (2024) conducted an analysis of the manner in which the implementation of structured models for financial planning and control promotes strategic decision-making processes, thereby mitigating risk and enhancing business sustainability. In a similar vein, Clemente et al. (2024) demonstrated that digitalization in SMEs enhances efficiency in financial management and fortifies their capacity to respond to market changes and economic crises. Conversely, Panchal et al. (2024) determined that digital transformation has been instrumental in enhancing business competitiveness,

enabling SMEs to adapt to evolving market demands and enhance their financial performance through the automation of critical processes.

The integration of digital technologies into financial management has led to substantial enhancements in the efficiency of business operations, underscoring the pivotal role of digitalization in the economic development of SMEs (Testa & González, 2024). Furthermore, the impact of automation on financial decision-making has been extensively documented, demonstrating that digitalization contributes to the reduction of operating costs and more effective management of resources (Méndez-Gutiérrez et al., 2023). Consequently, the authors concur that the utilization of digital platforms can enhance accessibility to financial resources, thereby facilitating business growth and expansion in competitive markets (Vargas, 2021). In summary, the extant research indicates that financial automation optimizes resource management and strengthens the competitiveness of companies. This, in turn, ensures sustainable development and better adaptability in a digitalized environment (Clemente et al., 2024).

Use of ICT in business management

Financial automation is a critical component of enhancing business management efficiency, particularly within the context of small and medium-sized enterprises (SMEs). Méndez-Gutiérrez et al. (2023) have indicated that digital transformation facilitates the optimization of financial processes, thereby allowing for more agile and structured access to critical data for decision-making. In a similar vein, Vargas (2021) underscored the positive impact of digitization on financial inclusion, asserting that it has served to reduce barriers to access and enhance the operational efficiency of businesses.

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The integration of digital technologies into financial management has led to substantial enhancements in the efficiency of business operations, underscoring the pivotal role of digitalization in the economic development of SMEs (Testa & González, 2024). Furthermore, the impact of automation on financial decision-making has been extensively documented, demonstrating that digitalization contributes to the reduction of operating costs and more effective management of resources (Méndez-Gutiérrez et al., 2023). Consequently, the authors concur that the utilization of digital platforms can enhance accessibility to financial resources, thereby facilitating business growth and expansion in competitive markets (Vargas, 2021).

In summary, the extant research suggests that financial automation has the potential to optimize resource management and strengthen the competitiveness of companies. This, in turn, ensures sustainable development and better adaptability in a digitalized environment (Clemente et al.). The utilization of Information and Communication Technologies (ICT) in business management has been demonstrated to be a pivotal element in enhancing the efficiency and sustainability of organizations. In this regard, the implementation of the Committee of Sponsoring Organizations of the Treadway Commission (COSO) model has facilitated the enhancement of internal control and financial management, the optimization of processes, and the reduction of risks in companies (Catagua et al., 2023).

Concurrently, the digital transformation in hospital administration has been demonstrated to enhance financial efficiency and transparency by means of the automation of records and the integration of digital systems in decision-making processes (Cuba & Cárdenas, 2023). Furthermore, the evaluation of digital transformation in small and medium-sized enterprises (SMEs) through the Alkire-Foster method facilitates advancements in digital infrastructure, though challenges related to the training of human talent to maximize the potential of these technologies persist (Moreira et al., 2025). Digitalization is similarly presented as a pivotal mechanism in promoting technological innovation in SMEs, favoring the development of new products and processes.

However, its impact varies depending on the level of investment in research and development (Radicic and Petković, 2023). Similarly, the entrepreneurial culture within micro and small enterprises has been influenced by the integration of ICTs, thereby enhancing their adaptability and sustainability within a dynamic business environment (Jiménez-López et al., 2023).

Conversely, the extant literature underscores the significance of digitalization in enhancing financial efficiency and optimizing business resources. Digital banking has emerged as a pivotal catalyst for financial inclusion in Peru, facilitating access to banking services for historically excluded sectors (Vargas, 2021). Concurrently, the advent of Fintech has facilitated the progression of SMEs in Guayaquil, empowering them to attain digital payment solutions and financial services that enhance their operational efficacy (Alvarado & Campodónico, 2023).

Furthermore, despite the limited adoption of ICT in certain SMEs, the favorable perception of entrepreneurs regarding its significance indicates the necessity for strategies that facilitate its effective implementation (Arguello, 2021). In a similar vein, digital transformation models in commercial companies prioritize enhancing competitiveness and consumer knowledge. However, these models encounter internal resistance to technological innovation (Townsend & Figueroa, 2022). Additionally, the digital transformation in human talent consulting companies has been shown to exert a positive impact on internal communication and job satisfaction, which are pivotal elements for efficiency in business management (Méndez-Gutiérrez et al., 2023).

Challenges and barriers in financial digitalization

The financial digitalization process faces significant challenges in the context of small and medium-sized enterprises (SMEs), particularly due to the structural and organizational barriers that hinder its adoption. Benavides and Bolaños' (2020) study demonstrated that substantial financial constraints and a paucity of financial resources constitute pivotal impediments to the integration of digital technologies within the framework of SMEs. Consequently, Faiz et al. (2024) identified that resistance to change

within these organizations is a determining factor that slows down the adoption of digital tools, especially in companies with traditional structures and a low technological culture.

Conversely, Marino et al. (2024) have noted that the degree of digital transformation in SMEs is not uniform, as the internationalization level and the educational background of managers directly impact their capacity to adopt technological innovations. In a similar vein, Hermann et al. (2023) have demonstrated that the absence of targeted support policies for financial digitalization engenders an adverse environment for these companies to surmount existing barriers.

A further analysis of SMEs that successfully integrate financial digitalization into their operations reveals its potential to enhance business performance. Digital transformation has been demonstrated to positively impact operational efficiency, cost reduction, and the optimization of financial processes (Merín-Rodrigáñez et al., 2024). Concurrently, studies have demonstrated that the integration of digital technologies into SMEs facilitates the acquisition of novel sources of financing, thereby rendering it more expedient to procure capital and augment their operational scope within more competitive marketplaces (Benavides and Bolaños, 2020).

Furthermore, they emphasize that digitalization enhances financial analysis capacity, enabling more agile and data-driven decision-making, which contributes to the sustainability and growth of companies (Faiz et al. 2024). In addition, it has been demonstrated that digital transformation encompasses more than merely the adoption of novel technologies; it also entails a reconfiguration of the business model to enhance competitiveness and innovation (Marino et al., 2024). The impact of digital innovation on financial management has been the subject of extensive research, emphasizing its role in cost optimization and strategic decision-making (Tipán & Abril, 2024).

A multitude of analyses concerning the prospective challenges confronting SMEs in the course of financial digitalization, with consideration for the evolution of the digital ecosystem and emerging regulations, indicate that companies must adopt more flexible and resilient strategies to confront the perpetual evolution of technology and the risks associated with cybersecurity (Hermann et al., 2023). Furthermore, the absence of digital infrastructure in select emerging markets curtails prospects for financial digitalization, compelling governments to devise policies that promote technological adoption in this sector (Merín-Rodrigáñez et al., 2024). Digital transformation similarly necessitates a comprehensive strategy, with the cultivation of human capital serving as a pivotal element in ensuring the continuity of the process (Faiz et al., 2024). It is imperative to acknowledge the pivotal role of technological integration in the realm of financial digitalization within SMEs. The efficacy of this integration is contingent upon the incorporation of emerging technologies, such as artificial intelligence and data analytics, into their management paradigms (Marino et al., 2024).

Digital strategies for business competitiveness

The financial digitalization process faces significant challenges in the context of small and medium-sized enterprises (SMEs), particularly due to the structural and organizational barriers that hinder its adoption. Benavides and Bolaños' (2020) study demonstrated that substantial financial constraints and a paucity of financial resources constitute pivotal impediments to the integration of digital technologies within the framework of SMEs. Consequently, Faiz et al. (2024) identified that resistance to change within these organizations is a determining factor that slows down the adoption of digital tools, especially in companies with traditional structures and a low technological culture.

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In the contemporary business landscape, digital transformation has emerged as a pivotal factor in enhancing competitiveness. Vargas (2021) demonstrated that digital banking has been instrumental in facilitating financial inclusion, enabling SMEs to access financial services with greater efficiency and flexibility. Concurrently, Alvarado and Campodónico (2023) identified that the implementation of Fintech has promoted the growth of these companies by offering innovative solutions that optimize costs and improve access to credit.

Conversely, numerous studies underscore the pivotal role of business technology in the competitiveness of SMEs, underscoring the imperative for efficacious digital strategies to ensure their sustainability in the market (Arguello, 2021). In this regard, Yanhong (2024) demonstrated that financial digitalization has driven technological innovation in Chinese companies, thereby enhancing resource allocation efficiency and facilitating business development throughout their life cycle.

Similarly, an examination of the Digital Economy and Society Index (DESI) illuminates the manner in which the integration of digital technologies enhances the competitive capacity of European SMEs. However, Skare et al. (2023) have noted that this process is also subject to regulatory challenges and difficulties in accessing finance, which necessitates the establishment of an adequate policy framework to maximize its benefits.

Conversely, the integration of digital strategies within business management has been demonstrated to enhance operational efficiency and ensure business sustainability. Arguello (2021) determined that the utilization of information and communication technologies in SMEs facilitates the optimization of productive and financial processes. However, the adoption of these technologies remains limited due to structural and financial barriers. In a similar vein, Vargas (2021) examined the impact of digital financial management on enhancing administrative efficiency and transparency in the utilization of resources across various sectors.

Concurrently, a multitude of studies have demonstrated that SMEs have adopted digital services, including mobile banking and electronic payment solutions, following global events such as the pandemic. This adoption has contributed to the enhancement of financial management (Alvarado & Campodónico, 2023). In the European context, Skare et al. (2023) identified that digital transformation has been pivotal in enhancing the adaptability of SMEs to market changes. However, challenges related to the absence of adequate training and technological resources persist.

In the context of the digitization of business models and financing strategies, Yanhong (2024) demonstrated that the evolution of digital financial networks has led to a reduction in financing restrictions for SMEs, thereby propelling the development of strategies that are based on digital platforms. As posited by Alvarado and Campodónico (2023), the adoption of innovative business models has been identified as a pivotal mediator in the digital transformation process of SMEs. This observation underscores the necessity for businesses to align their digitalization efforts with well-defined business strategies, thereby ensuring the maximization of their impact. Conversely, the adoption of digital technologies has been propelled by the imperative to enhance competitiveness and gain access to more extensive markets (Skare et al., 2023). Conversely, it has been determined that digital transformation has enabled SMEs to develop more accessible and efficient financing mechanisms, thereby promoting financial inclusion through innovative digital tools (Vargas, 2021).

In addition to the points, Alvarado and Campodónico (2023) conducted an analysis of how the adoption of digital technologies has optimized the financial management of SMEs by improving their control processes and strategic decision-making. Arguello's (2021) findings similarly indicate that digital transformation has been instrumental in enhancing internal communication and organizational efficiency, thereby positively impacting the competitiveness of SMEs. Finally, Yanhong's (2024) study demonstrated that digitalization has had a positive impact on the financing and sustainability strategies of SMEs, facilitating their adaptation to market changes and improving their financial performance.

Various analyses of the future challenges faced by SMEs in the process of financial digitalization, considering the evolution of the digital ecosystem and new regulations, suggest that companies must adopt more flexible and resilient strategies to face the constant evolution of technology and the risks associated with cybersecurity (Hermann et al., 2023). Furthermore, the absence of digital infrastructure in select emerging markets curtails prospects for financial digitalization, compelling governments to devise policies that promote technological adoption in this sector (Merín-Rodrigáñez et al., 2024). Digital transformation similarly necessitates a comprehensive strategy, with the cultivation of human capital serving as a pivotal element in ensuring the continuity of the process (Faiz et al., 2024). It is imperative to acknowledge the pivotal role of technological integration in the realm of financial digitalization within SMEs. The efficacy of this integration is contingent upon the incorporation of emerging technologies, such as artificial intelligence and data analytics, into their management paradigms (Marino et al., 2024).

Conclusions

Digital transformation has been identified as a primary catalyst for enhancing the competitiveness and sustainability of SMEs. It has been demonstrated to optimize their access to financing, operational efficiency, and expansion capacity. The advent of digital banking and the emergence of fintech platforms have played a pivotal role in facilitating financial inclusion, thereby mitigating credit constraints and enhancing accounting

transparency. This, in turn, has had a substantial positive impact on investment and business growth. Consequently, the integration of process automation and cash flow optimization has fostered enhanced strategic financial planning, leading to a reduction in operating costs and an augmentation in resilience within highly dynamic environments.

However, the implementation of these policies is still facing significant barriers, such as resistance to change, a lack of digital education, and deficiencies in technological infrastructure, especially in less developed regions. The issue of cybersecurity has come to the fore as a critical challenge, requiring the implementation of robust strategies to mitigate risks and ensure trust in digital financial services. Notwithstanding the aforementioned challenges, digital transformation continues to emerge as a transformative opportunity for SMEs, contingent upon the presence of supportive policies, financial incentives, and the adequate training of human talent.

While the present study has underscored the merits of digitalization, it is imperative that future research address the limitations that have been identified. The repercussions of security breaches, inequality in technological access, and the function of government regulations necessitate further examination. Furthermore, the heterogeneity in digital adoption across sectors and countries underscores the necessity for more contextualized approaches. Consequently, the absence of longitudinal studies hinders the precise evaluation of the long-term implications of digital transformation on business sustainability. Consequently, it is imperative to persist in the exploration of strategies that optimize their positive impact and facilitate effective integration into the global business landscape.

Consequently, this research has yielded several promising lines of study that warrant further exploration in the future. It is recommended that research be conducted to determine how government regulation and financing policies can enhance or impede the digitalization of SMEs. Furthermore, it would be pertinent to assess the impact of artificial intelligence and big data on the optimization of the financial and operational management of these companies. Another pivotal line of study pertains to the evaluation of the cybersecurity risks associated with digital transformation and their impact on the trust of entrepreneurs and customers. A more exhaustive investigation into the adaptation of workers to automation and its impact on productivity would also be valuable. Finally, comparative studies can be carried out between different regions to identify key factors in the adoption of technology in different economic environments.

References

Aisyah, S. (2024). The impact of dividend policy on company value: Evidence from public companies in the consumer sector. *International Journal of Financial Economics, 1*(6). https://ijefe.my.id/index.php/economic/article/view/133

Almeida, J. H. (2022). Innovación como herramienta para la gestión empresarial en las PYMEs de Santo Domingo. *Journal of Economic and Social Science Research, 2*(4), 68–81. https://doi.org/10.55813/gaea/jessr/v2/n4/26

Alvarado, K., & Campodónico, G. (2023). Análisis de las Fintech y su contribución al desarrollo de las PYMES en Guayaquil – Ecuador. *Revista Universidad y Sociedad, 15*(2), 475-483. http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S2218-36202023000200475&lng=es&tlng=es

Arguello, C., Barba, D., Andrade, C., & Esparza, F. (2021). Tecnología empresarial para las pymes, estrategia de competitividad en época de pandemia. *Revista Investigación y Negocios, 14*(24), 110-127.https://doi.org/10.38147/invneg.v14i24.152

Babilla, T. U. K. (2023). Innovación digital y acceso financiero para pequeñas y medianas empresas en una unión monetaria. *Modelado económico, 120,* 106182. https://doi.org/10.1016/j.econmod.2022.106182

Banco Interamericano de Desarrollo (2022). *Radiografía de la transformación digital en las firmas de América Latina y el Caribe*. Banco Interamericano de Desarrollo. http://dx.doi.org/10.18235/0004635

Banco Interamericano de Desarrollo (2023). *Hubs de innovación digital: perspectivas de la experiencia europea en el apoyo a la digitalización empresarial*. Banco Interamericano de Desarrollo. https://doi.org/10.18235/0004995

Banco Mundial (2023). *Conectados: Tecnologías digitales para la inclusión y el crecimiento*. Informe Económico América Latina y el Caribe (Octubre 2023). Banco Mundial. https://documents1.worldbank.org/curated/en/099041024190032046/pdf/P1812111db279e0141a72015f27c232cced.pdf

Benavides Pupiales, L. E., & Bolaños Delgado, S. L. (2020). Barreras de innovación en PYMES: una aproximación a través de una revisión sistemática de literatura. *Tendencias, 21*(1), 221–237. https://doi.org/10.22267/rtend.202101.134

Botelho, D. (2021). *Macroeconomic variables and capital structure: Public finance and insurance companies in Latin America and Asia*. *Revista Evidenciação Contábil & Finanças, 9*(2), 133. https://doi.org/10.22478/ufpb.2318-1001.2021v9n2.51666

Cardao-Pito, T. (2021). *Fisher-Modigliani-Miller organisational finance theory and the financialisation of contemporary societies*. *The European Journal of the History of Economic Thought, 28*(4), 499-522. https://doi.org/10.1080/09672567.2020.1840604

Catagua, M.L., Pinargote Macías, M.F., & Mendoza Vinces, M.E. (2023). Control interno y modelo COSO en la gestión administrativa y financiera empresarial. *Podium, 44*, 151–166. https://doi.org/10.31095/podium.2023.44.10

Clemente, J.A., Nicoara-Popescu, D., & Pastor-Sanz, I. (2024). Transformación digital en las pymes: comprensión de sus determinantes y heterogeneidad de tamaño. *La tecnología en la sociedad, 77*, 102483. https://doi.org/10.1016/j.techsoc.2024.102483

Cuba, A. E., & Cardenas Condori, C. R. (2024). Transformación digital y gestión financiera en la administración hospitalaria en una institución pública de salud. *Revista Dilemas Contemporáneos: Educación, Política y Valores, 11*(2), artículo 21. https://dilemascontemporaneoseducacionpoliticayvalores.com/index.php/dilemas/article/download/4028/3940/

Faiz, F., Le, V., & Masli, E. K. (2024). Determinantes de la adopción de tecnologías digitales en pymes innovadoras. *Revista de Innovación y Conocimiento, 9*(4), 100610. https://doi.org/10.1016/j.jik.2024.100610

Figueiro, P. J., & Sánchez, M. S. (2023). Plataformas financieras digitales, dinero propio y autonomía. Un análisis. *Revista Uruguaya de Antropología y Etnografía, 8*(2), 1-30. https://doi.org/10.29112/ruae.v8i2.1951

Flores, A. C., & Flores, M. P. (2024). Análisis de la rentabilidad en Colegios Peruanos SA que aplica normas internacionales de información financiera en el periodo 2019-2020. *Economía & Negocios*, *6*(1), 104–124. https://doi.org/10.33326/27086062.2024.1.1593

Florez, P., & Florez, H. (2024). Innovación en los modelos de administración de empresas: Revisión de literatura. *Impulso, Revista De Administración, 4*(8), 229-245. https://doi.org/10.59659/impulso.v.4i8.59

Fonseca, D. E., Fonseca, C. A., & Meo, L. I. (2024). Impact of digital transformation on financial management in SMEs in Boyacá: An approach to competitiveness. *Journal of International Crisis and Risk Communication Research*, *121–138*. https://doi.org/10.63278/jicrcr.vi.811

Gao, X. (2024). Desbloquear el camino hacia la contabilidad financiera digital: un estudio sobre las pymes y las empresas emergentes chinas. *Revista de finanzas globales, 61*, 100970. https://doi.org/10.1016/j.gfj.2024.100970

Goetzmann, W. N. (2023). *Harry Markowitz in Memoriam*. *Financial Analysts Journal, 79*(4), 5-7. https://doi.org/10.1080/0015198X.2023.2251861

Gu, F., Gao, J., Zhu, X., & Ye, J. (2023). The impact of digital inclusive finance on SMEs' technological innovation activities—Empirical analysis based on the data of new third board enterprises. *PLOS ONE, 18*(11), e0293500. https://doi.org/10.1371/journal.pone.0293500

Guerard, J. (2023). *Harry Markowitz: An appreciation*. *International Journal of Forecasting, 39*(4), 1496-1501. https://doi.org/10.1016/j.ijforecast.2023.07.004

Hermann, A., Gollhardt, T., Cordes, A.-K., von Lojewski, L., Hartmann, M. P., & Becker, J. (2024). Transformación digital en pymes: una taxonomía de proyectos de innovación digital con apoyo externo. *Revista internacional de gestión de la información, 74*, 102713. https://doi.org/10.1016/j.ijinfomgt.2023.102713

Jiang, Z., Ma, G. and Zhu, W. (2022), "Research on the impact of digital finance on the innovation performance of enterprises", *European Journal of Innovation Management*, Vol. 25 No. 6, pp. 804-820. https://doi.org/10.1108/EJIM-02-2022-0094

Kwan, C. K., & Alegre, M. (2024). Desarrollo e implementación de software de gestión de costos y su influencia en la optimización de procesos en empresas industriales. *INVESTIGATIO*, (22). https://doi.org/10.31095/investigatio.2024.22.5

Leguizamón s, Y. L. (2024). *Innovación contable en las pymes a través de las operaciones electrónicas*. Apuntes Contables, 33, 195-220. https://doi.org/10.18601/16577175.n33.09

Moreira, S., Pinto, S., Costa, L., & Araújo, N. (2025). Evaluación de la transformación digital en pequeñas y medianas empresas mediante el método Alkire-Foster. *Heliyon, 11*(2), e41838. https://doi.org/10.1016/j.heliyon.2025.e41838

Luján, L. R., Centurión, M. G., López, M. E., Gheringhelli, L. M., & Mareco, G. P. (2023). Transformación Digital de las PYMES en Paraguay: Retos y Oportunidades. *Ciencia Latina Revista Científica Multidisciplinar*, *7*(5), 8294-8309. https://doi.org/10.37811/cl_rcm.v7i5.8411

Marino, J. A., Palos-Sánchez, P. R., & Velicia-Martín, F. (2024). Evolución de la transformación digital en la gestión de las pymes a través de un análisis bibliométrico. *Technological Forecasting and Social Change, 199*, 123014. https://doi.org/10.1016/j.techfore.2023.123014

Méndez-Gutiérrez, X. M., Valiente-Saldaña, Y. M., Mantilla-Sevillano, J. E., & Gonzales-Rentería, Y. G. (2023). Transformación digital y su impacto en la gestión empresarial de empresas consultoras de talento humano. *Revista Arbitrada Interdisciplinaria Koinonía, 8*(1), 705–717. https://doi.org/10.35381/r.k.v8i1.2837

Merín-Rodrigáñez, J., Dasí, Á., & Alegre, J. (2024). Transformación digital y desempeño empresarial en pymes innovadoras: el papel mediador de la innovación en el modelo de negocio. *Technovation, 134*, 103027. https://doi.org/10.1016/j.technovation.2024.103027

Ministerio de la Producción. (2024). *Micro y pequeñas empresas representan el 99.2% del tejido empresarial peruano*. Programa Nacional "Tu Empresa". https://www.gob.pe/institucion/tuempresa/noticias/898863-micro-y-pequenas-empresas-representan-el-99-2-del-tejido-empresarial-peruano

Musa, S. K., & Njeru, A. W. (2023). Effect of digital financial innovation on the financial performance of small and medium enterprises in Nairobi City Centre, Kenya. *International Journal of Social Science and Humanities Research, 1*(1), 466-482. https://doi.org/10.61108/ijsshr.v1i1.41

Panchal, G., Clegg, B., Eslamian Koupaei, E., Masi, D., & Collis, I. (2024). Transformación digital e inteligencia de negocios para una PYME: investigación-acción desde el pensamiento sistémico utilizando modelos PrOH. *Procedia Ciencias de la Computación, 232*, 1809-1818. https://doi.org/10.1016/j.procs.2024.02.003

Peñaloza, D. E., & Córdova Romaní, R. A. (2024). Potenciando la Competitividad de las micro y pequeñas empresas (MYPE) a través de la Innovación Tecnológica: : estrategias clave para el éxito. *REVISTA DE INVESTIGACIÓN*, *48*(112), 141–160. https://doi.org/10.56219/revistadeinvestigacin.v48i112.2640

Peñarrieta, A. G., Mina, K. J., & Wila, K. J. (2024). Transformación digital: uso de tecnologías emergente en la auditoría financiera: Digital transformation: use of emerging technologies in financial auditing. *LATAM Revista Latinoamericana De Ciencias Sociales Y Humanidades*, *5*(5), 1806 – 1819. https://doi.org/10.56712/latam.v5i5.2721

Petrona, F. (2025). Gestión financiera de las microempresas del sector comercial negocios de tecnología en Pilar, Paraguay - Año 2024. *Ciencia Latina Revista Científica Multidisciplinar*, *8*(6), 11897-11930. https://doi.org/10.37811/cl_rcm.v9i1.16185

Radicic, D., & Petković, S. (2023). El impacto de la digitalización en las innovaciones tecnológicas en las pequeñas y medianas empresas (PYME). *Technological Forecasting and Social Change, 191*, 122474. https://doi.org/10.1016/j.techfore.2023.122474

Rojas, D., Mirabal Y., Trujillo, A., & Pavón Bencomo, I. (2022). Gestión financiera operativa en la empresa avícola Pinar del Rio, Cuba. *Costos y Gestión*, (103), 14–51. https://doi.org/10.56563/costosygestion.103.1

Sabry, F. (2024). *Harry Markowitz*. Mil Millones De Conocimientos. https://www.google.it/books/edition/Harry_Markowitz/nlbzEAAAQBAJ?hl=es&gbpv=0

Skare, M., De las Mercedes de Obesso, M., & Ribeiro Navarrete, S. (2023). La transformación digital y las pequeñas y medianas empresas (PYME) europeas: un estudio comparativo utilizando datos del índice de la economía y la sociedad digitales. *Revista internacional de gestión de la información, 68*, 102594. https://doi.org/10.1016/j.ijinfomgt.2022.102594

Stulz, R. M. (2022). *Merton Miller's contribution to modern finance*. *Journal of Applied Corporate Finance, 34*(1), 118-128. https://doi.org/10.1111/jacf.12493

Testa, G. L., & Gonzalez, J. C. (2024). Plataformas tecnológicas de desarrollo productivo: principales resultados de un estudio comparativo a nivel nacional e internacional. *Revista Espacios*, *45*(3), Art. 10. https://doi.org/10.48082/espacios-a24v45n03p10

Tipán, A., & Abril Flores, J. F. (2024). Modelo de gestión financiera para toma de decisiones en microempresas de Ambato-Tungurahua. *RES NON VERBA REVISTA CIENTÍFICA, 14*(2), 34–55. https://doi.org/10.21855/resnonverba.v14i2.919

Townsend, J., & Figueroa, J. (2022). Los modelos de transformación digital en la gestión de las empresas comerciales. *COODES*, *10*(2), 407-429.

http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S2310-340X2022000200407&lng=es&tlng=es

Vargas, A. (2021). La banca digital: innovación tecnológica en la inclusión financiera en el Perú. *Ind. data*, *24*(2), 99-110. https://doi.org/10.15381/idata.v24i2.20351

Wang, J., & Qian, X. (2024). Dinámica de las finanzas digitales y su impacto en la financiación de las pymes. *Heliyon*, *10*(9), e30586. https://doi.org/10.1016/j.heliyon.2024.e30586

Yanhong (2024). El impacto de las finanzas digitales en la innovación tecnológica a lo largo de los ciclos de vida de las empresas en China. *Heliyon*, *10*(14), e33965. https://doi.org/10.1016/j.heliyon.2024.e33965