UNIVERSIDAD DEL AZUAY

# Faculty of Legal Sciences

# School of International Studies

Digital Transformation and Its Influence on the Internationalization of Small and Medium-sized Enterprises (2020-2025): Literature Review

**Project prior to obtaining a Bachelor's Degree in International Studies**

**Author:**
Anthony Daniel Portilla Ordoñez

**Advisor:**
Juan Carlos Pauta Ortiz

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To my parents, for being the fundamental pillar of my life, for their sacrifices and for their unconditional support in each of the stages of my academic training.

To my brothers and friends, whose company and words of encouragement motivated me to keep going, being the necessary engine to complete this process

This achievement is, above all the fruit of that great love and confidence of my loved ones in my abilities. Thank you for being my greatest blessing.

I dedicate this achievement to myself as a testament to my perseverance and determination to overcome the academic and personal challenges that arose in the process.

This work represents not only the culmination of my career in International Studies, but also the beginning of a new stage of professional growth driven by my own determination.

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## RESUMEN

El presente estudio analiza las implicaciones de la transformación digital en la internacionalización de las PyMEs durante el periodo 2020-2025, mediante una revisión sistemática de literatura bajo el protocolo PRISMA 2020, se revisaron estudios entre 2020 y 2025 en bases de datos especializadas Web of Science, Scopus, Dimensions, Redalyc y Lens. Se utilizaron estrategias de búsquedas avanzadas y criterios de inclusión y exclusión. Los resultados indicaron que la eficiencia operativa, el acceso a nuevos mercados y la competitividad global son los beneficios más comunes, mientras que las limitaciones financieras, falta de competencias digitales e infraestructura inadecuada representan las barreras principales. Se destaca el uso del comercio electrónico transfronterizo y los impactos positivos en incremento de exportaciones y diversificación de canales. Las tendencias apuntan hacia una digitalización integral de procesos que desafían los modelos tradicionales de internacionalización. Finalmente se identificaron vacíos en estudios longitudinales y análisis en contextos de economías emergentes. Se concluye que la transformación digital es un factor determinante para la expansión internacional de las PyMEs, aunque su éxito depende de la superación de limitaciones estructurales internas.

**Palabras clave:** transformación digital, digitalización, pymes, internacionalización, comercio internacional.

**Digital Transformation and Its Influence on the Internationalization of Small and Medium-Sized Enterprises (2020-2025): Literature Review**


## ABSTRACT

This study analyzes the implications of digital transformation for the internationalization of SMEs during the 2020–2025 period. Using a systematic literature review conducted in accordance with the PRISMA 2020 guidelines, studies published between 2020 and 2025 were reviewed in the specialized databases Web of Science, Scopus, Dimensions, Redalyc, and Lens. Advanced search strategies and inclusion and exclusion criteria were employed. The results indicated that operational efficiency, access to new markets, and global competitiveness are the most common benefits, while financial constraints, a lack of digital skills, and inadequate infrastructure represent the main barriers. The use of cross-border e-commerce and its positive impacts on export growth and channel diversification are highlighted. Trends point toward comprehensive process digitization that challenges traditional internationalization models. Finally, gaps were identified in longitudinal studies and analyses within the context of emerging economies. It is concluded that digital transformation is a determining factor for the international expansion of SMEs, although its success depends on overcoming internal structural constraints.



**Keywords:** digital transformation, digitalization, smes, internationalization, international trade.

## 1. Introduction

Digital transformation has established itself as a strategic and organizational process that goes beyond mere technological adoption to redefine itself as a force that fundamentally alters the structures, practices, and values of companies (Hinings et al., 2018). In the context of globalization and the Fourth Industrial Revolution, this phenomenon has gained greater relevance, as it is a process through which companies seek to increase their competitiveness and optimize their performance in international markets (Verhoef et al., 2021).

The significance of this issue lies in the crucial role that SMEs play in the global economy, accounting for more than 99% of businesses in the European Union and 99.5% of businesses in Latin America and the Caribbean. However, these companies face pressure from the need to undergo a profound transformation in order to compete in global markets, as well as from the multiple internal and external barriers that limit their progress (Del Do et al., 2023). Morgan (2019) notes that many organizations fail to transform their mindset, internal processes, and organizational culture to foster change, demonstrating that technology alone does not guarantee the success of digital transformation.

### 1.1 Research Motivation

The motivation for this research stems from the rapid pace of digital transformation during the 2020–2025 period and its direct impact on how small and medium-sized enterprises (SMEs) position themselves in the international market. Globalization and the intensive use of digital technologies in small and medium-sized enterprises (SMEs) are causing companies to restructure their business models to become competitive beyond their borders, where many companies face constraints related to access to technology, digital literacy, and organizational adaptation, which hinder the internationalization process (Herrera Sánchez et al., 2023).

Given this reality, analyzing how digital transformation influences the capabilities of SMEs is crucial for international expansion, as it improves operational efficiency while reducing barriers to entry into new markets and strengthening relationships with customers and strategic partners (Castaño, 2024). This literature review systematically organizes and critically analyzes the scientific evidence regarding digital transformation and its influence on the internationalization processes of SMEs during the 2020–2025 period.

### 1.2 Problems

Digital transformation is emerging as a matter of survival for SMEs, as traditional business models are being disrupted and pressured by competitors who are adopting digital technologies more quickly, as well as by changes in consumer behavior that are impacting their business models (Del Do et al., 2023).

Despite the opportunities offered by digitalization, many SMEs are unable to capitalize on its benefits due to constraints such as a shortage of financial resources, a lack of technological expertise, and the absence of an organizational culture oriented toward change for innovation (Sandoya et al., 2024). The central research question concerns the difficulty SMEs face in balancing the need to implement digital transformation strategies that enable them to compete in international markets against the internal and external barriers that hinder the internationalization process during the 2020–2025 period.

### 1.3 General Objective

To analyze, through a Systematic Review of Literature, the main implications of digital transformation in the internationalization of SMEs, identifying benefits, challenges and opportunities, generating a critical analysis of the current impact and future trends.

### 1.4 Specific Objectives

- Establish a systematic review protocol, clearly defining the inclusion and exclusion criteria, sources of information, search strategies, and selection procedures.
- Develop the process of searching and analyzing the scientific literature, applying the established protocol for collecting, filtering, and evaluating relevant studies.
- Interpret and synthesize the results in order to construct a critical analysis of the current state and future trends of this field.

## 2. Theoretical Framework

### 2.1 Concept and Evolution of Digital Transformation

Digital transformation involves the integration of digital technologies across all areas of a business, changing its working methods and generating added value for customers; this is particularly crucial for SMEs seeking to expand into international markets (Tran et al., 2025). Unlike the simple digitization of activities, the concept involves strategic and

organizational changes aimed at generating value, improving efficiency, and adapting to dynamic and competitive environments (Gallardo et al., 2024).

Digital transformation is understood as an organizational capacity to adapt businesses to technological advancements and the challenges of the international market, making it a crucial factor for sustainability. Its evolution is intertwined with both technological development and economic and social changes. In their early stages, companies focus primarily on automating processes and the initial adoption of basic digital tools (Quispe et al., 2025).

Over the past decade, the concept has taken on a more comprehensive approach driven by technologies such as e-commerce, cloud computing, and digital platforms, which enable big data analysis and are transforming the way companies operate and compete internationally (Ortiz et al., 2025). Between 2020 and 2025, digital transformation accelerated due to globalization, increased connectivity, and changes in consumer habits. In this context, it ceased to be an option and became a strategic necessity, especially for small and medium-sized enterprises seeking to maintain their competitiveness and expand into international markets (Ruiz, 2025).

Digital transformation is a strategic and ongoing process that focuses not only on the implementation of technologies but also has implications for companies' culture, processes, and business models. Its evolution demonstrates that it responds both to technological advancements and to the demands of a dynamic and highly competitive global environment. This is a key factor in the international expansion of companies, particularly SMEs (Beltrán & Tipán, 2025).

### 2.2 Digital Technologies Applied to SMEs

Quispe et al. (2025) found that these technologies improve the automation of operations to drive value creation in relationships with customers, suppliers, and other stakeholders within the business environment. In the case of SMEs, their adoption is primarily driven by efficiency, as it reduces costs and increases organizational flexibility. Among the main digital technologies used by SMEs are e-commerce integrated with business management systems and digital communication and marketing platforms—tools that enable companies

to overcome geographical limitations and access new markets by offering products or services in a more personalized manner.

The use of digital technologies streamlines the internationalization of businesses by facilitating activities such as logistics, electronic payments, and relationships with international customers (Veiga, 2021). The growing number of SMEs adopting digital technologies reflects the need to adapt to an increasingly competitive and digitized business environment. The level of implementation varies among companies, depending on factors such as size, sector, and the availability of resources (Yaranga et al., 2025).

### 2.3 Digital Transformation in Small and Medium-sized Enterprises

Digital transformation in SMEs represents a process of profound change that goes beyond the simple adoption of digital technologies. According to González et al. (2024), the process involved redefining strategies, organizational structures, and work methods, with the aim of improving business performance and responding quickly to market demands. In SMEs, digital transformation unfolds gradually in line with their capabilities, which determine both its scope and the results achieved (Sandoya et al., 2024).

Various studies indicate that SMEs face specific challenges when implementing digital transformation, such as limited financial resources, a lack of specialized personnel, and resistance to organizational change (Guillermo et al., 2025).

These barriers directly influence the pace and depth of the process, leading to differences among companies and sectors. However, SMEs that strategically integrate digitalization achieve improvements in operational efficiency and strengthen their capacity for innovation (Carrasco et al., 2025). Digital transformation is becoming increasingly important for SMEs due to changes in the economic environment, such as the digitization of markets, the need to maintain operational continuity, and the demand for more efficient relationships within the business ecosystem (Guillermo et al., 2025).

### 2.4 Internationalization of SMEs

SMEs face challenges in the internationalization process due to their size; the availability of resources and their understanding of the international environment ultimately affect their level of internationalization. According to the Uppsala model, internationalization develops

progressively, beginning with sporadic exports and, as the company gains experience and knowledge, advancing toward a more sophisticated presence in international markets (Cervantes et al., 2023). On the other hand, network-based approaches highlight the importance of interorganizational relationships and strategic partnerships as a mechanism to promote, facilitate access to, and consolidate a presence in international markets (Gómez Acevedo et al., 2024). Traditional internationalization was viewed as a gradual process in which companies progressively engage with international markets as they acquire experience and knowledge (Cervantes et al., 2023).

These models help mitigate internal shortcomings through collaboration and shared learning for SMEs. Starting in 2024, more dynamic methods began to emerge that consider the impact of digitalization on internationalization processes, incorporating concepts such as "born global" or digital companies, in which some SMEs internationalize from early stages thanks to the intensive use of digital technologies (Rodríguez, 2024).

### 2.5 Relationship between Digital Transformation and Business Internationalization

Digital transformation has brought about changes in how companies are engaging with international markets, particularly in the case of small and medium-sized enterprises. The adoption of digital technologies enables many companies to reduce their reliance on physical infrastructure, thereby facilitating communication with foreign customers and suppliers, as well as providing access to statistical data for strategic decision-making (Guillermo et al., 2025).

As a result, internationalization has evolved from a lengthy and costly process into an increasingly accessible option, thanks to the adoption of digital tools in areas such as sales, marketing, logistics, and internal management, which have transformed traditional mechanisms of international expansion (Bella et al., 2024). Through e-commerce using digital platforms and online management systems, SMEs offer their products and services in different countries while coordinating operations remotely to respond more quickly to the demands of each market (Palma et al., 2024).

Digital transformation is a key driver of internationalization processes that has redefined how companies grow and position themselves on the global stage (Yordanova et al., 2024).

### 2.6 Benefits of Digital Transformation in the Internationalization of SMEs

Digital transformation has provided SMEs with opportunities to enter international markets through the adoption of digital tools that enable them to manage international operations more efficiently, reduce logistics costs, and facilitate communication across different countries (Rodas et al., 2023).

The ability to collect and analyze consumer data alongside information on international markets through digital platforms equipped with data analytics systems helps identify consumer trends for SMEs, enabling them to adapt their products and services to the needs of each market based on this information. This, in turn, increases the likelihood of success in their internationalization efforts, thereby enhancing their competitiveness against larger companies (Layza et al., 2025).

### 2.7 Digital Maturity Models in SMEs

Digital maturity models are used to assess the level of adoption and utilization of digital technologies within organizations, which has enabled them to progress through successive stages of their digital transformation processes. These models are particularly useful because they recognize that digitalization is a gradual process that depends on factors such as available resources, business leadership, and organizational culture (García et al., 2025).

Baque et al. (2025) noted that SMEs reached varying levels of digital maturity, ranging from an initial stage characterized by the basic use of information technology to more advanced levels where digitalization became an integral part of the business model.

In the intermediate stages, companies adopted e-commerce for digital process management, using online platforms to communicate with customers and suppliers (Palma et al., 2024). As they progressed in their digital maturity, SMEs developed a greater capacity to analyze data while innovating their products and services to meet the demands of more complex competitive environments (Guillermo et al., 2025).

Digital maturity models helped explain why some SMEs were able to integrate more easily into international markets, as those companies that achieved higher levels of digital maturity had better tools for managing cross-border operations by accessing information on foreign markets and establishing business relationships through digital channels (Baque et al., 2025).

### 2.8 Dynamic Capabilities and Digital Competitive Advantage

Dynamic capabilities form the foundation of companies' ability to identify opportunities and threats in their environment and to adapt their internal resources to reconfigure strategies in response to changing contexts. In a digitized and globalized environment, possessing capabilities has become increasingly important for companies, helping them develop their competitiveness beyond merely having technological resources, as it requires learning to innovate and respond dynamically within constantly changing international environments (Iturralde et al., 2024).

Digital transformation, driven by dynamic capabilities, was strengthened through the strategic use of technologies in data analysis by digital platforms in conjunction with information systems. This improved decision-making by basing it on continuous, real-time information from processes, enabling the adaptation of business models to new market demands (Aranciba, 2024).

For SMEs, the development of dynamic digital capabilities offset their structural limitations by generating competitive advantages that enhanced their flexibility and innovation capacity in response to larger competitors. The dynamic capabilities associated with digitalization became a sustainable competitive advantage, enabling them to identify opportunities in international markets where they established business relationships through digital channels (Escutia & de la Vega, 2023).

### 2.9 Human Capital and Digital Skills in SMEs

Human capital played a central role in digital transformation processes, where employees' knowledge and skills directly influenced the adoption and effective use of digital technologies. It was found that digitalization requires more than just the availability of technological tools; it also demands that workers and managers have the ability to understand, manage, and integrate these technologies into organizational processes (Fajardo et al., 2025).

Digital competencies encompassed a set of knowledge requiring skills and attitudes related to the use of information technologies for data management and digital communication. In SMEs, the development of these competencies faced limitations associated with a lack of

training, coupled with a shortage of specialized personnel, which is also affected by resistance to change (Vera et al., 2025).

However, the study by (Yaranga et al., 2025) noted that investment in digital training improved operational efficiency by fostering innovation for the implementation of digital strategies aligned with business objectives. Human capital with advanced digital skills paved the way for SMEs to participate in global markets, where trained staff manage e-commerce platforms to interact with international customers using information from various markets (Bonilla et al., 2024). The finding highlighted that strengthening human capital alongside digital skills expanded the scope of digital transformation.

### 2.10 Internal and External Barriers to Digital Transformation

#### Internal barriers

Internal barriers are primarily related to the organization and structure of companies. The most common issues were limited access to financial resources, a lack of personnel specialized in digital technologies, and the absence of a clearly defined digital strategy (Herrera, 2024).

Resistance to change among managers and employees makes it difficult to incorporate new tools into processes, especially when there was a lack of understanding regarding their long-term benefits (López et al., 2025). Added to this is the weakness of an organizational culture oriented toward innovation and continuous learning, which reduces flexibility and responsiveness to technological changes, along with a lack of ongoing training that limits the implementation and effective use of available technologies (Santillán, 2025). Internal limitations directly influence the pace and scope of digital transformation within organizations.

#### External barriers

External barriers, meanwhile, are linked to the environment in which SMEs operate; these include insufficient digital infrastructure, limited access to external financing, and the scarcity of public policies aimed at supporting digitalization. Furthermore, certain regulatory aspects constrain opportunities for technology adoption (Pozo et al., 2025).

### 2.11 Digital Ecosystems and International Business Networks

Digital ecosystems are understood as interconnected environments in which companies interact with technology platforms to enable their suppliers, customers, and institutions to exchange information, resources, and knowledge. For SMEs, these ecosystems help overcome structural limitations by providing access to shared digital infrastructure for broader markets (Bravo et al., 2024).

It is noted that participation in digital ecosystems fosters innovation, collaboration, and value creation as drivers of competitiveness. International business networks facilitate access to information on foreign markets, reducing uncertainty and fostering trust among stakeholders. Through strategic alliances and cooperation networks, SMEs have established commercial relationships with international partners without the need for a physical presence in target markets (Sánchez-Quinde et al., 2024).

Networks enable the sharing of knowledge to coordinate activities and capitalize on business opportunities on an international scale, where the integration of SMEs into digital ecosystems with international business networks is enhanced by the use of technologies such as platforms that reduce barriers to entry into international markets and streamline commercial interaction processes (Guillen-Miranda, 2024).

### 2.12 Cross-border e-commerce

Cross-border e-commerce refers to the sale of goods and services via digital platforms between businesses and consumers located in different countries. This form of commerce has gained increasing importance with the digital transformation, which has overcome geographical barriers to enable more agile and flexible access to international markets (Guillermo et al., 2025). For SMEs, cross-border e-commerce represented a strategic alternative to traditional internationalization models by reducing entry costs and minimizing the need for physical infrastructure in target markets (Mirzaye & Mohiuddin, 2025).

It was determined that cross-border e-commerce expanded the internationalization of SMEs by simplifying processes such as marketing promotion and the management of international transactions. Through global marketplaces with digital platforms and online payment systems, companies offered their products or services to international customers, tailoring their offerings to different cultural and consumer contexts (Ruiz et al., 2024).

However, this type of commerce posed challenges related to international logistics due to customs regulations and tax management, factors that influenced the performance of SMEs in foreign markets. SMEs that succeeded in developing digital capabilities in cross-border e-commerce were able to enhance their international presence with greater competitiveness, which served as a sales channel for expansion (Batuparan et al., 2025).

### 2.13 Supportive Public and Institutional Policies

In some cases, public and institutional policies drive the digital transformation of small and medium-sized enterprises where structural limitations or technological gaps exist. Pozo et al. (2025) found that intervention by the state and institutional bodies was important in creating favorable conditions for the adoption of digital technologies through appropriate regulatory frameworks with economic incentives and support programs aimed at fostering innovation in business competitiveness.

Among the main institutional support measures for SME digitalization are financing programs with subsidies, training, and technical advisory services for the adoption of digital technologies. These initiatives reduce both the economic and knowledge barriers faced by businesses to promote the development of digital competencies through access to technological infrastructure (Guillermo et al., 2025).

The role of international organizations and development agencies in promoting projects has influenced the digitalization of SMEs' integration into global markets, as public policies focused on digitalization contribute to SMEs' ability to compete in international markets (Fedulova & Stadnyk, 2025). Institutional support facilitates the adoption of tools such as e-commerce and online management systems, which enable companies to expand their international reach (Palma et al., 2024).

### 2.14 Risks and Challenges of Internationalization

Reliance on digital technologies exposed companies to risks such as system failures or operational disruptions, along with vulnerabilities in information security (Yaranga et al., 2025).

For SMEs, these risks proved critical due to their limited capacity to invest in robust technological infrastructure and advanced digital protection mechanisms associated with digitalization, such as cybersecurity and data protection. The management of sensitive customer information, along with international transactions, required compliance with diverse regulations and standards, which increased operational complexity for SMEs (Borbor et al., 2025). A lack of knowledge regarding digital security increases exposure to fraud or cyberattacks, resulting in data loss, which undermines customer trust and corporate reputation in international markets. Therefore, adapting to heterogeneous digital environments and constant changes in international regulations required a continuous update of their digital strategies (Sotelo & Quispe, 2025).

### 2.15 Digital Transformation and International Competitiveness

The use of digital technologies has developed competitive advantages based on flexibility and innovation through digital platforms and information systems, allowing cross-border operations to be conducted more efficiently. SMEs that adopted digitalization in a planned manner and aligned with their internationalization goals maintained competitive advantages over time (Chicaiza, 2025).

### 2.16 Digital Innovation as an Internationalization Strategy

Digital innovation is primarily defined as the application of digital technologies to the development of new products or services, along with the processes and business models that establish it as a strategy for companies' internationalization. Organizations' capacity for digital innovation has shaped how they respond to the demands of international markets, enabling them to adapt more quickly to changes in the business environment (Jiménez et al., 2025)

For SMEs, digital innovation represents an opportunity to overcome limitations of scale and resources through their entry into foreign markets, manifested through the development of business models based on digital platforms for e-commerce, with personalized offerings enabled by data analysis (Maldonado-Cacay et al., 2023). Digital innovation as an internationalization strategy requires long-term planning for integration consistent with business objectives, as SMEs that systematically adopted digital innovation increased their learning capacity, thereby enhancing their organizational flexibility and developing sustainable competitive advantages in the international arena (Villarreal, 2024).

## 3. State of the Art

Various studies agree that digitalization has become a key enabler of international expansion by allowing for process optimization, reduced transaction costs, and access to new markets through digital platforms (Mirzaye & Mohiuddin, 2025; Yordanova et al., 2024).

It is noted that digital transformation improves the operational efficiency and innovation capacity of SMEs, where research such as that by Sandoya et al. (2024) and Rodas et al. (2023) indicated that the adoption of digital technologies such as e-commerce, in conjunction with business management systems and data analytics, enables companies to overcome structural limitations inherent to their size. Similarly, Costa et al. (2023) demonstrated that digitization enhances organizational performance through strategic flexibility and responsiveness to dynamic international markets.

Several authors analyzed the role of digital transformation as a catalyst for the internationalization process. (Carrera-Calderón et al., 2025) argue that information and communication technologies reduce coordination costs within global value chains for the integration of SMEs into foreign markets. Furthermore, Yaranga et al. (2025) demonstrated through structural equation models that there is a positive relationship between the level of business digitalization and international performance. The findings align with recent approaches that suggest that digitalization shortens the traditional stages of the Uppsala model and the emergence of global firms (Cervantes et al., 2023).

According to Pozo et al. (2025) and López et al. (2025), the presence of multiple barriers that limit the full realization of digital transformation has led to the identification of recurring constraints, such as a shortage of financial resources, a lack of digital skills among the workforce, organizational resistance to change, and gaps in technological infrastructure. In Latin America, Vera et al. (2025) emphasized that these limitations are exacerbated in SMEs due to their lower investment capacity and the weakness of local digital ecosystems.

The research integrates approaches based on dynamic capabilities and digital maturity, where Iturralde et al. (2024) argued that competitive advantage in digital environments depends on technology adoption alongside companies' ability to reconfigure their resources and learn continuously. Along the same lines, Baque et al. (2025) demonstrated that SMEs

at advanced levels of digital maturity are more likely to succeed in internationalization processes when they combine technology with coherent organizational strategies.

On the other hand, cross-border e-commerce has emerged as one of the most studied mechanisms in recent literature, with Mirzaye & Mohiuddin (2025) highlighting that this model reduces barriers to entry into international markets and allows SMEs to internationalize with less physical investment. However, Batuparan et al. (2025) noted that international logistics still faces challenges, such as customs regulations and cybersecurity, which affect the sustainability of digital expansion.

Quantitative studies involving bibliometric analyses and systematic reviews predominated, with a strong geographical concentration in Asia and Europe (Bella et al., 2024; López et al., 2025). This situation highlighted a gap in scientific output focused on Latin America, particularly in the context of developing economies where structural conditions differ. Some authors agreed on the need for more comprehensive research that simultaneously analyzes technological, organizational, and institutional factors (Arenas et al., 2025).

Rosa et al. (2025) noted that globalization and the digital transformation of SMEs in the internationalization process emerged as a strategic process with both opportunities and challenges. Tools such as e-commerce and digital marketing opened pathways to international markets, yielding competitive advantages. However, the studies agreed that many SMEs face barriers such as limited access to technology due to insufficient digital skills; furthermore, a lack of knowledge of international regulations and organizational resistance to change were factors that restricted their capacity for international expansion (Arenas et al., 2025; Guillermo et al., 2025).

It is recognized that digital transformation helps reduce traditional geographical barriers, allowing SMEs to compete with larger companies, which generates positive impacts on both business performance and local and regional economic development. This underscores the need for in-depth contextualized analysis with strategies adapted to local realities (Costa et al., 2023). Tamayo et al. (2019) highlight the importance of assessing staff digital competencies and technological resources as measures of digital maturity.

López et al. (2025) note an increase in scientific output between 2021 and 2024, with a greater concentration of studies in Asia and Europe, reflecting growing interest in the adoption of technologies by businesses.

The identification of keywords and co-citation networks revealed a relationship between digital transformation, sustainability, the Internet of Things, and Industry 4.0 in topics related to technology implementation, organizational innovation, and sustainability. However, several methodological limitations were identified, such as reliance on databases dominated by English-language publications and the lack of longitudinal analyses (Bella et al., 2024).

Carrera-Calderón et al., (2025) examined the impact of digital transformation on business internationalization processes, highlighting the role of information and communication technologies in reducing transaction costs associated with relationship management within supply chains. They also indicated that the adoption of ICTs influenced companies' strategic decisions by lowering internal and external coordination costs for expansion into international markets.

Evidence of the positive effects of digitalization revealed limited attention to the negative impacts and associated risks, highlighting the need for more critical and balanced approaches in analyzing digital transformation in international business (Arenas et al., 2025).

Studies by (Guillermo et al., 2025) and Coelho et al. (2025) indicate that despite growing interest in technology adoption in the region, gaps still persist in technological infrastructure, access to financing, and human talent skills; these limitations result in a differentiated adoption of technologies that reduce the time it takes for SMEs to integrate into international markets.

In the realm of digital ecosystems, the importance of business networks and collaborative platforms as mechanisms that drive internationalization is highlighted. Bravo et al. (2024) and Ruiz et al. (2024) noted that participation in digital ecosystems allows SMEs to compensate for their scale limitations by accessing shared resources, including knowledge and global marketing channels. Digitalization acts as a technological tool that serves as the

linchpin for new forms of business cooperation, redefining traditional models of international expansion.

According to Fajardo et al. (2025), human capital and digital leadership are closely linked, as they agree that the success of digital transformation depends largely on the digital competencies of managers and employees, as well as on the existence of an innovation-oriented organizational culture. SMEs that invest in digital training and change management demonstrate higher levels of technological maturity and achieve better results in internationalization processes.

Regarding associated risks, greater attention is paid to vulnerabilities arising from digital environments. Borbor et al. (2025) and Sotelo & Quispe (2025) noted that SMEs face cybersecurity challenges related to data protection and international regulatory compliance. These threats affect customer trust and operational continuity in companies with limited resources to invest in digital security infrastructure; empirical evidence on digital risk management in internationalized SMEs is still in its infancy.

Bella et al. (2024) proposed that digitalization simultaneously contributes to competitiveness and sustainability by optimizing resources through waste reduction and improved traceability in international supply chains; however, this requires further theoretical consolidation, as more evidence is needed to demonstrate how sustainable digitalization impacts the internationalization of SMEs in emerging economies.

## 4. Methods

This study is a Systematic Literature Review (SLR) conducted with the aim of organizing, synthesizing, and critically analyzing the scientific evidence on the influence of digital transformation on the internationalization of SMEs during the 2020–2025 period. This approach allowed us to organize and synthesize the information to answer the research questions and provide an overview of the current state of the field. The methodological process was carried out in accordance with the guidelines of the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol (Page et al., 2021).

### 4.1 Research Question

Research question: The study problem was delimited with which the guiding research question of the review was formulated, focused on understanding through the population (SMEs seeking to participate in international markets), the intervention (Digital Transformation) and the results. Based on this question, the criteria for searching, selecting and analyzing scientific evidence were defined.

General Question: What are the key benefits, challenges and opportunities of digital transformation in internationalization for SMEs, according to the scientific literature (2020-2025) and how does this process allow us to identify its impact and future trends?

In this step, the research questions are defined using the PICOT model (Population, Intervention, Comparison, Results, Time), which allows us to have greater clarity in the formulation of the questions.

**PICOT Model**

- Population: Articles reporting on digital transformation in SMEs.
  Small and medium-sized enterprises (SMEs) are those with fewer than 250 employees.
  These are divided into microenterprises, which have fewer than 10 employees; small enterprises, which have 10 to 49 employees; and medium-sized enterprises, which have 50 to 249 employees. Thus, large enterprises are defined as those with 250 or more employees (OECD, 2023).
- Intervention: Application of digital technologies in all areas of the company for a Digital Transformation.
- Comparison: Traditional Business Models
- Outcome: Benefits, challenges, opportunities, impacts and trends of DT in the internationalization of SMEs.
- Time: Publications between 2020 and 2025

3 research questions were structured using this model:

- Q1: What are the key benefits, challenges and opportunities of digital transformation in internationalization for SMEs, according to the scientific literature (2020-2025)?
- Q2: How does this process of digital transformation in SMEs allow us to identify its application and impact?
- Q3: What are the future trends of digital transformation in the context of the internationalization of SMEs?

**Use of thesaurus**

The UNESCO Thesaurus was used to define keywords, as it constitutes a controlled and structured vocabulary for thematic analysis and document retrieval with a multidisciplinary approach (UNESCO, 2026). This ensured consistency and breadth in search strategies, allowing us to find synonyms for the terms internationalization, digital transformation, and small and medium-sized enterprises.

### 4.2 Exclusion and Inclusion Criteria

The inclusion criteria of the systematic review ensure the relevance and rigor of the scientific evidence analyzed.

**Inclusion criteria:**

- Publications between 2020 and 2025.
- Research that addresses the relationship between digital transformation, internationalization and SMEs
- Documents available in full text.
- Publications in English and Spanish.

**Exclusion criteria:**

- Duplicate records.
- Grey literature (theses, non-refereed reports, institutional documents).
- Studies without access to the full text.
- Items outside the established time period.
- Literature reviews
- Literature reviews

- Bibliometric analysis

### 4.3 Identification of Information Sources

Databases: The scope of the search is defined by selecting disciplinary and multidisciplinary databases to be used in the research.

- Web of science
- Scopus
- Dimensions
- Redalyc
- Lens

### 4.4 Search Strategy

The search strategy is composed of a combination of descriptors in Spanish and English, using Boolean operators (AND, OR) to increase the selection of relevant studies, in an organized and coherent manner, to answer the research question and objectives.

In order to obtain the most relevant scientific literature, the search chain is designed based on 3 key concepts, among the keywords used are: digital transformation, small and medium-sized enterprises (SMEs) and internationalization. In addition, related synonyms were identified in English and Spanish.

Search Criteria: Advanced search strings are designed from the research keywords in each selected database to maximize the accuracy of the results.

**Table 1**
*Search String*

| Concept | Chain | Connector |
|---|---|---|
| **Transformation Digital** | "digital transformation", "digitalization", "digitization", "digital technology", "Industry 4.0", "digital innovation", "digital strategy", "technological transformation", "business digitalization", “Transformación digital”, “digitalización” | AND |
| **Internationalization** | "internationalization", "internationalisation", "globalization", "globalisation", "foreign market*", "export*", "foreign direct investment", "cross-border trade", "global expansion", "international business", “internacionalización” | AND |
| **SMEs** | "small and medium-sized enterprise", “SME*”, “PyME*”, "small business*", "small Enterprise*", “Pequeñas y Medianas empresas” | AND |
| **Search string** | ( TITLE-ABS-KEY ( "digital transformation" OR "digitali*ation" OR "industry 4.0" OR "transformación digital" OR "digitalización" ) AND TITLE-ABS-KEY ( "internationali*ation" OR "export*" OR "foreign market*" OR "internacionalización" ) AND TITLE-ABS-KEY ( "SME*" OR "small and medium enterprise*" OR "PYME*" OR "pequeña y mediana empresa*" ) ) | |

### 4.5 Study Selection Process

Scientific studies that answer the question are identified.

The search strategy aimed to identify scientific studies related to digital transformation and its impact on the internationalization of small and medium-sized enterprises. To do this, the previously defined search strings were used, using Boolean operators to join key terms to the research.

**Table 2**

*Search Strings for Databases*

| | **Search strings** |
|---|---|
| **Global search string** | ( TITLE-ABS-KEY ( "digital transformation" OR "digitali*ation" OR "industry 4.0" OR "transformación digital" OR "digitalización" ) AND TITLE-ABS-KEY ( "internationali*ation" OR "export*" OR "foreign market*" OR "internacionalización" ) AND TITLE-ABS-KEY ( "SME*" OR "small and medium enterprise*" OR "PYME*" OR "pequeña y mediana empresa*" ) ) |
| **Search string for WOS** | (("digital transformation" OR "digitalization" OR "industry 4.0" OR "digital technology") AND ("internationalization" OR "export" OR "foreign market") AND ("SME" OR "small and medium enterprise" OR "small business")) |
| **Search string in Scopus** | TITLE-ABS-KEY ( digital transformation OR digitalization OR Industry 4.0 OR digital technology AND internationalization OR export OR foreign market AND SME OR small Medium enterprise OR small business ) AND PUBYEAR > 2019 AND PUBYEAR < 2026 |
| **Dimensions** | ( "digital transformation" OR "transformación digital" ) AND ( "internationalization" OR "internacionalización" ) AND ( "SME" OR "PYME" ) |
| **Search string for LENS** | (title:("digital transformation" OR "digitali*ation" OR "industry 4.0" OR "transformación digital" OR "digitalización") OR abstract:("digital transformation" OR "digitali*ation" OR "industry 4.0" OR "transformación digital" OR "digitalización")) AND (title:("internationali*ation" OR "export*" OR "foreign market*" OR "internacionalización") OR abstract:("internationali*ation" OR "export*" OR "foreign market*" OR "internacionalización")) AND (title:("SME*" OR "small and medium enterprise*" OR "PYME*") OR abstract:("SME*" OR "small and medium enterprise*" OR "PYME*")) |
| **Search string for Redalyc** | (transformación digital AND internacionalización AND PYME) |

To identify literature related to the research topic, three main concepts outlined in the protocol were used; these were combined with Boolean operators and truncation to retrieve articles containing different terminological variations. However, due to differences in the structure and syntax of the various databases used in this study, it was necessary to adapt the search string for each database in order to optimize the results obtained.

**Table 3**

*Database Search Results*

| **Database** | **Results** |
|---|---|
| **WOS** | 44 |
| **SCOPUS** | 26 |
| **Dimensions** | 85 |
| **LENS** | 85 |
| **REDALYC** | 45 |
| **Total** | 285 |

A preliminary search was carried out, where the exclusion and inclusion criteria such as language and year were applied, all the articles were exported and organized using a bibliographic manager, in this case Zotero, which allowed to facilitate the process of eliminating duplicates.

Studies that meet the eligibility criteria and duplicates are selected. Through the Zotero bibliographic manager, it was possible to eliminate duplicate articles.

**Table 4**
*Deduplication*

| | Number of articles |
|---|---|
| **Identified records** | 285 |
| **Duplicates Removed** | 35 |
| **Remaining Records** | 250 |

The availability of the full text of each of the collected articles was then verified. Studies that could not be accessed through the database or institutional repositories were excluded from this analysis.

**Table 5**
*Deleting Items Without Access*

| | Number of articles |
|---|---|
| **Evaluated articles** | 250 |
| **No access** | 90 |
| **Remaining Articles** | 160 |

Filtering by language and methodology

The inclusion criterion was that articles must be published in English or Spanish. Consequently, during this stage, 8 articles published in languages other than those specified were excluded, as were 16 articles classified as gray literature, literature reviews, bibliographic reviews, and bibliometric reviews.

**Table 6**
*Elimination of Articles by Language and Methodology*

| | Number of articles |
|---|---|
| **Evaluated articles** | 160 |
| **Languages and methodology** | 8+16 |
| **Remaining Articles** | 136 |

After applying the criteria of deduplication, accessibility and language, with a total of 136 articles, the next screening step was carried out by reviewing titles and abstracts.

Filter by title or abstract: Articles that do not comply with the central theme are discarded. To this end, it was evaluated whether the articles addressed the following elements:

- Digital transformation
- Small and medium-sized enterprises (SMEs)
- Internationalization processes

After the review of titles and abstracts, 79 articles were excluded because they did not address the relationship between digital transformation and the internationalization of SMEs.

**Table 7**
*Items That Meet the Eligibility Criteria*

| | Number of articles |
|---|---|
| **Evaluated articles** | 136 |
| **Excluded items** | 79 |
| **Remaining Articles** | 57 |

All 57 articles were considered relevant for the next phase of extraction.

### 4.6 Data Extraction Criteria

During the preliminary process, articles that met the criteria established in the systematic review protocol were identified, selected, and screened. At this stage, the number of documents found and screened is determined, along with how many of these meet the inclusion and exclusion criteria, and data extraction criteria are implemented. The full text is read to verify that the studies align with the research questions and established criteria.

At this stage, a complete reading of the 57 selected articles was conducted to verify that they met the research questions and objectives set forth. During this process, a data extraction matrix was created in Excel to systematize the information from each article. This facilitated data organization, allowing us to identify patterns, trends, and methodological approaches in the analyzed literature.

**Table 8**
*Excel Matrix*

| Category | Description |
|---|---|
| Database | Database from which the article was taken |
| Author | Study author(s) |
| Year of publication | Year the article was published |
| Study Title | Full title of the article |
| Methodology | Type of methodology used (quantitative, qualitative or mixed) |
| Study variables | Main variables analyzed in the research |
| Geographical context | Country or region where the study was conducted |
| Main results | Main findings or conclusions of the study |

Specific data extraction criteria were established in relation to the research questions (Q1–Q3). These criteria help organize the information in a structured manner and ensure that the results accurately address the research questions and objectives. The criteria include benefits obtained from internationalization processes (C1), organizational or technological challenges faced (C2), strategic opportunities identified (C3), type of impact reported (C4), emerging future trends (C5), and gaps in the literature (C6).

All extraction criteria directly address a research question. Regarding Q1, the benefits, challenges, and opportunities encountered in SMEs are considered; regarding Q2, organizational impacts and the classification of the identified type of reported impact are considered; regarding Q3, future trends and gaps in the literature are compiled and analyzed.

This process allows us to classify, compare, and synthesize the information in a structured manner to answer the research questions coherently, which strengthens the transparency, reproducibility, and rigor of the systematic review, thereby reducing the risk of interpretive biases and reinforcing the validity of the results obtained.

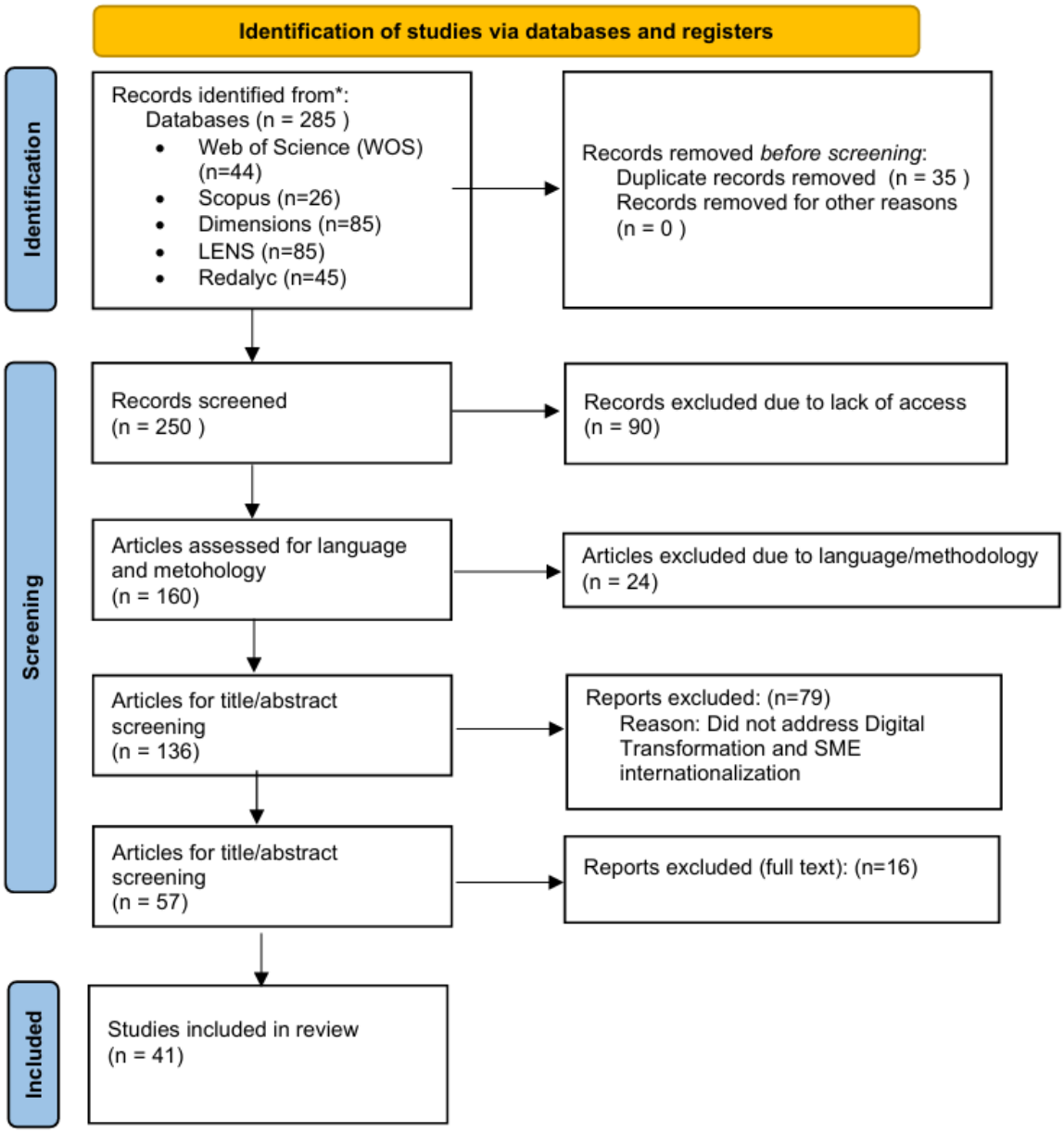
**Table 9**
*Extraction Criteria*

| Criteria Question 1 (P1) | | | |
|---|---|---|---|
| **Code** | **Criteria** | **Feature** | **Description** |
| **EC01** | Type of benefit identified | To classify the benefits reported in studies on digital transformation in internationalization. | Access to new markets, Cost reduction, Operational efficiency, Global competitiveness, Supply chain, Customer experience |
| **EC02** | Type of challenge identified | Identify the main constraints faced by SMEs in their digital transformation process to internationalize. | Financial constraints, Lack of skills, Resilience to change, Infrastructure, Regulatory barriers, Cybersecurity |
| **EC03** | Strategic Opportunities | Register emerging opportunities derived from digital transformation in international processes. | Cross-border e-commerce, Big Data, AI and automation, Blockchain, Cloud computing, Digital ecosystems |
| **Criteria Question 2 (Q2)** | | | |
| **Code** | Criteria | Feature | Description |
| **EC04** | Type of impact reported | Classify the impact of digital transformation on internationalization. | Export growth, Market penetration, Channel diversification, Global image, Innovation, Resilience |
| **Criteria Question 3 (P3)** | | | |
| **Code** | Criteria | Feature | Description |
| **EC5** | Future trends | Determine the type of impact expected in the medium and long term. | AI Adoption, Servitization, Digital Sustainability, Enabling Platforms, Process Digitalization, Born globals |
| **EC6** | Gaps in the literature | Identify underexplored areas or limitations detected in the studies reviewed. | Longitudinal studies, Emerging economies, Organizational culture, Digital risks, Effects by size |

## 5. Results

To ensure transparency in the study selection process, the PRISMA flowchart was used, which details the stages of identification, screening, eligibility assessment, and inclusion of articles. The process is described in detail, starting with the records identified in the previously selected databases and continuing through to the selection of the final articles for the systematic review. In this procedure, the results were refined by applying the exclusion and inclusion criteria, thereby ensuring that the most relevant studies would be used for the analysis, in accordance with the PRISMA guidelines to guarantee the quality and reproducibility of the study (Page et al., 2021).

**Figure 1**
*Prism Flow Chart*




*Note:* Adapted from "The PRISMA 2020 statement: An updated guideline for reporting systematic reviews", by , BMJ, 372, n71 (https://doi.org/10.1136/bmj.n71). Page et al. (2021)

The full texts of the 57 potentially relevant articles were reviewed. At this stage, a thorough analysis of the 57 articles was conducted to verify their alignment with the study's objectives and research question. During this process, 16 articles that did not address the relationship between digital transformation and the internationalization of SMEs were excluded, leaving 41 articles to be included in the systematic review.

**Figure 2**

*Articles Published by Year*

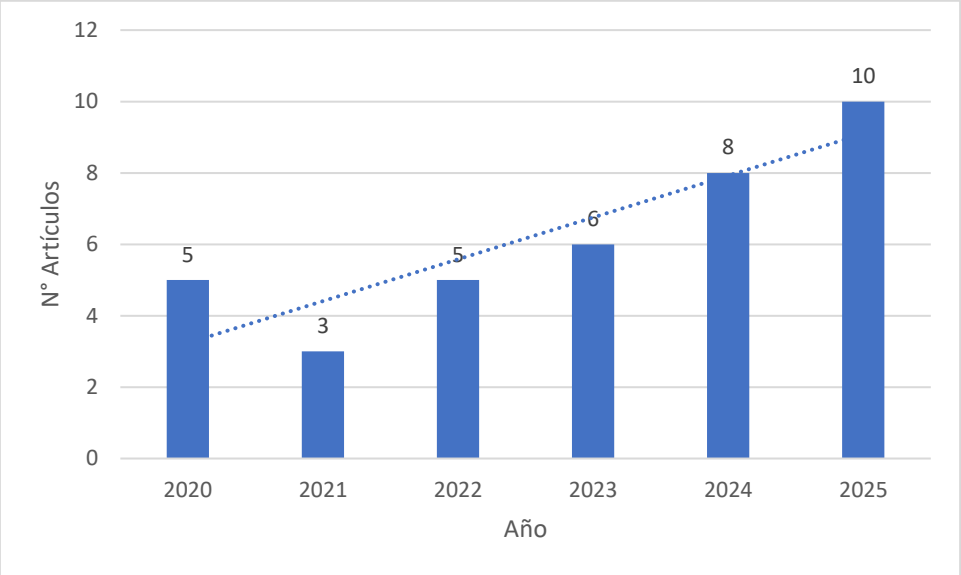



Figure 2 presents the chronological evolution of the studies selected for the literature review. It highlights an upward trend in scientific output in recent years, with steady growth observed since 2022. This acceleration confirms a growing interest in and consolidation of the field of study within the scientific community. This upward trajectory provides us with a solid foundation of recent evidence to conduct up-to-date research.

## 5.1 Benefits of Digital Transformation in the Internationalization of SMEs

**Figure 3**

*Bar Chart Question 1 (Benefits)*

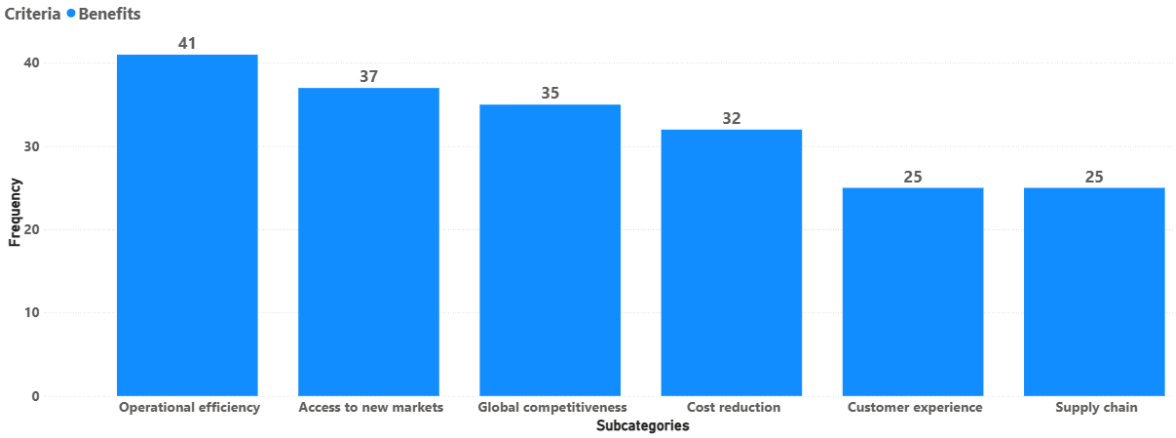



Figure 3 shows the frequency distribution of the benefits of digital transformation in the internationalization of SMEs. The most frequently cited benefits in the literature were: operational efficiency (41 studies) 100.0%, access to new markets (37 studies) 90.2%, and global competitiveness (35 studies) 85.4%, followed by cost reduction (32 studies) 78.0%, supply chain improvement (25 studies) 61.0%, and customer experience (25 studies) 61.0%.

The most significant and widely reported finding in the literature is that digital transformation improves operational efficiency (100%) (Ekawarti et al., 2025; Tran et al., 2025), which is achieved through process automation, technology adoption, and workflow optimization (Gallardo et al., 2024; Quispe et al., 2025). This benefit is particularly crucial for organizations with scale limitations, as it allows them to reduce response times and operational costs, enabling them to generate sustainable competitive advantages (Iturralde et al., 2024).

Access to new markets (90.2%) is cited as the second most frequent benefit. As noted by Yordanova et al. (2024), Guillermo et al. (2025), and Zhang et al. (2025), technologies reduce the information and coordination costs associated with international expansion, enabling SMEs to overcome the geographical barriers that previously limited their reach. Evidence shows that information and communication technologies facilitate the reduction of costs associated with coordinating global value chains, meaning that entry into international markets can be achieved with lower initial investment (Carrera-Calderón et al., 2025). Digital transformation enables SMEs to overcome traditional barriers to internationalization

through digital platforms and e-commerce tools (Palma et al., 2024). Cam Thuy et al. (2023) demonstrate that SMEs with a higher level of digital transformation not only avoid a decline in exports during crises such as the COVID-19 pandemic but also accelerate their internationalization. Nurfaizal et al. (2025) note that access to international markets is easier when small and medium-sized enterprises combine the use of digital platforms with digital literacy.

The most common benefits relate to operational efficiency and expansion into international markets, confirming that digital transformation acts as a strategic lever for internationalization in the process of integrating the business model into SMEs (Batuparan et al., 2025).

Greater global competitiveness (85.4%) highlights the ability of SMEs to compete with larger companies in international markets. Digital transformation is a factor that is becoming increasingly established within companies, enabling them to achieve global competitiveness by developing advantages in adaptation and innovation (Chicaiza, 2025). It is also noted that the adoption of digital technologies enables more efficient management of international operations, reducing logistics costs and facilitating communication (Rodas et al., 2023). The adoption of technologies is a strategic enabler that improves the international competitiveness of smaller companies (Veiga, 2021).

Improvements in operational efficiency (100%) and increased global competitiveness (85.4%) are widely discussed in the literature. Ekawarti et al. (2025) note that digital transformation and business model shifts enhance companies' competitiveness. Tran et al. (2025) confirm that innovation-driven digital transformation has a direct impact on the export performance of SMEs. Similarly, García & Landeros (2020) demonstrate that the adoption of technologies (Internet of Things, artificial intelligence, Big Data) improves operational efficiency and reduces barriers to entry into international markets.

Supply chain optimization (61%) is cited as another key benefit. The adoption of digital technologies contributes to competitiveness and sustainability through resource optimization, waste reduction, and improved traceability in the supply chain (Bella et al., 2024). Martinčević & Kozina (2020) demonstrate that digital technologies accelerate

decision-making through information analysis and access to information crucial for supply chain management.

Cost reduction (78.0%); Reim et al. (2022) note that the adoption of digital technologies allows SMEs to develop new business models with lower financial risk. Dallocchio et al. (2024) demonstrate that by adopting technologies such as e-commerce and digital technologies, SMEs can attract foreign customers with a much smaller investment, thereby increasing the number of international sales. Ciasullo et al. (2022) demonstrate that digitalization in omnichannel strategy allows SMEs to reduce intermediation costs and logistical barriers.

Improved customer experience (61.0%) emerges as a benefit derived from the adoption of digital channels and personalization. Ballerini et al. (2023) highlight three main factors of digital platforms: visibility, efficiency, and access to new markets, identifying a positive effect on company performance. Dallocchio et al. (2024) find that SMEs with higher levels of digitalization achieve better results in international sales and shopping experience.

The identified benefits indicate that digital transformation is a determining factor in the internationalization process, as operational efficiency and access to new markets are crucial benefits from which other benefits derive.

## 5.2 Challenges and Barriers of Digital Transformation in the Internationalization of SMEs

**Figure 4**

*Bar Chart Question 1 (Challenges)*

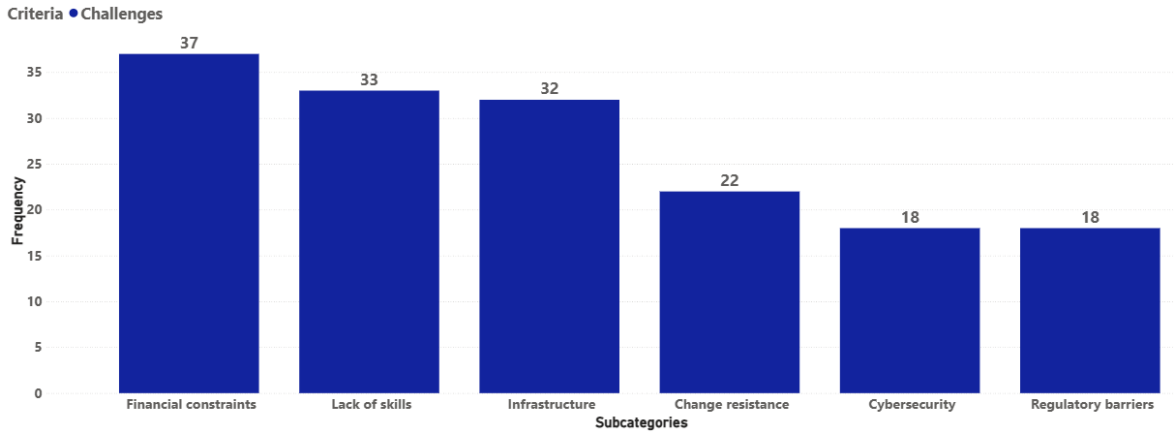



Figure 4 shows that the most common challenges identified in the literature were: financial constraints (37 studies) 90.2%, lack of digital skills (33 studies) 80.5%, and infrastructure (32 studies) 78.0%, followed by resistance to change (22 studies) 53.7%, regulatory barriers (18 studies) 43.9%, and cybersecurity (18 studies) 43.9%.

Main barriers identified

Barriers are classified into two main subdivisions:

- Financial Constraints: 90.2%
- Lack of digital skills: 80.5%
- Inadequate technological infrastructure: 78.0%
- Resistance to organizational change: 53.7%
- Regulatory and normative barriers: 43.9%
- Cybersecurity and data protection: 43.9%

The literature shows that internal barriers carry greater weight than external ones; in particular, the scarcity of financial resources and digital skills significantly limits technology adoption among many SMEs (Arenas et al., 2025; Fajardo et al., 2025). This indicates that organizational readiness is a crucial factor for the success of digital transformation.

The literature highlights significant barriers that hinder the digital transformation process in SMEs; while digital transformation facilitates internationalization, the resources required to

implement it represent the primary limitation. Financial constraints (90.2%) are the most frequently mentioned barrier in the literature review, highlighting the tension between the recognition of the potential for international expansion and the reality of limited resources that characterize SMEs (López et al., 2025; Pozo et al., 2025). Clemente-Almendros et al. (2024) note that the size of the SME is a crucial determinant, which is why microenterprises tend to lag further behind, primarily due to their limited resources. Torres et al. (2025) confirm that microenterprises tend to have lower levels of digital adoption compared to small and medium-sized enterprises, thereby creating a digital divide based on company size. Tran et al. (2025) note that 40% of Vietnamese SMEs lack the financial resources to implement advanced technologies. Holl & Rama (2024) note that larger, more established SMEs are more likely to adopt digital technologies. Martinčević & Kozina (2020) point out that technology adoption varies by firm size and sector, identifying SMEs as the most affected by a lack of capital.

The lack of digital skills (80.5%)—cited as the second most frequent barrier in the literature—highlights the importance of human capital in digital transformation processes. Authors such as Fajardo et al. (2025) and Vera et al. (2025) highlight the need to develop digital skills to better capitalize on internationalization opportunities, as it is not merely about adopting technological tools, but rather the ability of workers and managers to effectively manage, understand, and integrate these tools into business processes. Digital competencies encompass knowledge, skills, and attitudes regarding the use of technologies, data management, and digital communication; their absence significantly hinders the capacity for internationalization (Yaranga et al., 2025). Bonilla et al. (2024) highlight the role of human capital with digital competencies in expanding the scope of digital transformation, which enables the management of platforms and interaction with international customers, leveraging information from different markets; thus, the company's success is largely linked to its digital competencies and an innovation-oriented organizational culture. Torres et al. (2025) note that the digitization process does not depend solely on the adoption of technologies, but rather on the company's preconditions—such as size, level of internationalization, and managerial literacy—which shape this process.

Peng et al. (2025) demonstrate that digital capability and the capabilities of the export manager are predictors of the adoption of digital platforms, noting that transformation depends on managerial competencies and staff capabilities. Nurfaizal et al. (2025) note that

digital literacy is the bridge between the use of digital platforms and access to global markets; therefore, a lack of digital competencies weakens the impact of these platforms. Martinčević & Kozina (2020) note that technological absorptive capacity is related to the use of digital technologies; thus, firms with greater absorptive capacity are better able to adopt digital technologies more easily and quickly. González Arellano & Acosta-Gonzaga (2021) note that managerial capabilities are crucial for SMEs in bridging the gap between intention and results.

Inadequate technological infrastructure (78%) represents a structural barrier that hinders SMEs, particularly in emerging economies. Insufficient digital infrastructure, limited access to external financing, and the absence of public policies aimed at the adoption of digital technologies constrain companies' opportunities for technological implementation (Pozo et al., 2025). These limitations are particularly pronounced in Latin American contexts, where gaps in technological infrastructure, digital capabilities, and financing lead to greater inequality in technology adoption (Guillermo et al., 2025). Đeđanski et al. (2024) demonstrate that the level of digital adoption among SMEs and the national digital ecosystem has a considerable influence on internationalization; consequently, due to deficiencies in practical implementation, it weakens the regulatory support and infrastructure necessary to facilitate international trade.

Resistance to organizational change (53.7%) represents an underdeveloped internal barrier that hinders the adoption of new digital tools. Resistance from managers and employees greatly hinders the incorporation of new tools, especially when there is a lack of awareness of the long-term benefits (Herrera, 2024; Sandoya et al., 2024). Thus, the absence of an organizational culture oriented toward innovation and continuous learning drastically reduces companies' flexibility and responsiveness to technological changes (Santillán, 2025). Mollyk (2023) demonstrates that organizational culture can be an impediment to international expansion if not managed correctly. Clemente-Almendros et al. (2024) demonstrate that a manager's age negatively influences digital transformation, as older managers exhibit greater resistance to technological change. Yu et al. (2022) note that, during internationalization through digital transformation, data overload, information silos, and confusion in decision-making generate resistance to technological change. Tran et al. (2025) demonstrate that corporate culture positively influences digital transformation, but also acknowledge that conservative corporate cultures hinder technological change.

Regulatory barriers (43.9%) and cybersecurity challenges (43.9%). It is emphasized that managing sensitive customer information and international transactions requires compliance with multiple regulations, which increases operational complexity (Borbor et al., 2025; Sotelo & Quispe, 2025). A lack of knowledge regarding digital security increases the risk of cyberattacks, which can damage reputation and trust. Dađanski et al. (2024) note that cybersecurity measures are essential for protecting sensitive data and maintaining international consumer trust. Muhammad & Budi (2025) note that 65% of exporting SMEs in Indonesia face cross-border regulatory barriers, which increases operational complexity. Biea & Ciuciuc (2025) mention that regulatory barriers are one of the challenges faced by Romanian SMEs in their internationalization process; they also note that the use of cybersecurity is crucial for protecting reputation and promoting international collaboration. Holl & Rama (2024) and Cugno et al. (2024) report that the adoption of cybersecurity remains low.

Evidence suggests that internal barriers carry greater structural weight than external ones, as they act as prerequisites for reaping the benefits of digital transformation; thus, without overcoming financial constraints, digital skills, and infrastructure limitations, the benefits do not materialize.

### 5.3 Opportunities of Digital Transformation in the Internationalization of SMEs

**Figure 5**

*Bar Chart Question 1 (Opportunities)*

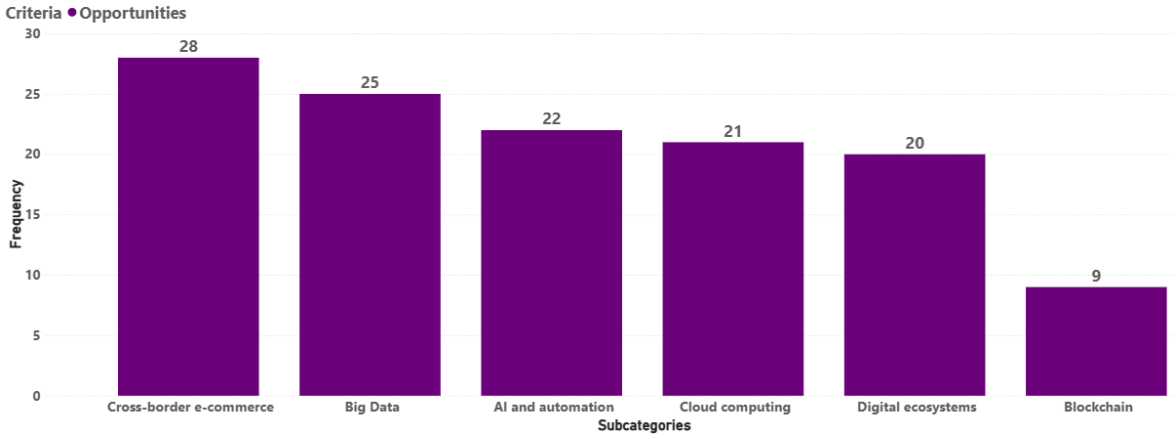



Figure 5 shows that the most common opportunities were: cross-border e-commerce (28 studies) 68.3%, big data (25 studies) 61.0%, AI and automation (22 studies) 53.7%, followed by cloud computing (21 studies) 51.2%, digital ecosystems (20 studies) 48.8%, and blockchain (9 studies) 22.0%.

The analysis reveals strategic opportunities for SMEs, which they can leverage to drive their internationalization through digital transformation.

Cross-border e-commerce (68.3%) emerges as the most frequent opportunity in the literature for SMEs; authors such as Mirzaye & Mohiuddin (2025), Batuparan et al. (2025), and Mäki & Toivola (2021) have emphasized this channel for SME internationalization; this model reduces barriers to entry into international markets and allows SMEs to internationalize with a lower initial investment. It is noted that cross-border e-commerce simplifies processes such as promotion, marketing, and the management of international transactions, enabling the offering of products abroad and customization (Guillermo et al., 2025). The impact depends on the level of organizational readiness and the companies' ability to strategically integrate digital technologies (Villarreal, 2024). Dallocchio et al. (2024) demonstrate that e-marketing tools (data management and social media) have a positive impact on SMEs, and the use of third-party digital platforms enables better performance than the use of proprietary digital platforms. Similarly, González Arellano & Acosta-Gonzaga (2021) confirm that international third-party digital platforms such as Amazon facilitate exporting and entry into foreign markets.

Big Data and predictive analytics (61%) are identified as key opportunities for guiding evidence-based decision-making. Layza et al. (2025) note that the ability to collect and analyze information on customers and international markets allows for the identification of patterns and consumer trends to adapt products to the needs of each market—that is, personalization is achieved, which increases the chances of success. Cugno et al. (2024) note that Big Data is one of the technologies most used by Italian SMEs (40%) in Industry 4.0 and is positively correlated with export performance; on the other hand, Holl & Rama (2024) note that Big Data is a tool with significant growth potential in European SMEs, but it is underutilized compared to basic digital technologies.

The adoption of artificial intelligence (53.7%), which marks a new phase in the evolution of digital transformation, positions artificial intelligence as a key enabling technology for future internationalization strategies. Muhammad & Budi (2025) demonstrate that market analysis based on machine learning enhances the international competitiveness of SMEs. Hruby (2025) demonstrates that the implementation of AI in digital processes does not yield significant changes unless it is accompanied by a strategic orientation that supports it. Cugno et al. (2024) report that artificial intelligence is one of the least-used technologies in Industry 4.0 by Italian SMEs; complementing this, Holl & Rama (2024) note that adoption stands at 7.2% in the European context.

Cloud computing and digital services (51.2%) reduce the initial investment barriers to technology adoption. They allow SMEs to access advanced technological capabilities without a large capital investment through pay-as-you-go models, which is especially useful where access to financing is a significant challenge. Clemente-Almendros et al. (2024) note that micro-enterprises face greater barriers in terms of resources and capabilities, making pay-as-you-go models for digital services an alternative for these firms that would otherwise be excluded from access to digital infrastructure. Uribe & Norman (2020) note that SMEs adopt digital internationalization strategies based on cloud platforms and services. Holl & Rama (2024) and Kyshakevych et al. (2024) note that the adoption of cloud technologies by SMEs in Europe varies by country; some achieve high levels of usage and drive economic growth, while others record much lower rates.

Digital ecosystems (48%): Studies highlight the role of digital ecosystems as a key factor in the internationalization processes of SMEs. Ruiz et al. (2024) and Bravo et al. (2024) emphasize that participation in digital ecosystems enables SMEs to overcome their scale limitations through access to shared resources, knowledge, and global marketing channels. Dođanski et al. (2024) note that governments will play a crucial role in facilitating SMEs' entry into international markets through digital ecosystems. Kolagar et al. (2022) demonstrate that participation in digital ecosystems is linked to digital servitization and internationalization; SMEs with greater involvement in ecosystems exhibit higher rates of international growth. Reim et al. (2022) note that SMEs can adopt strategies based on digital ecosystems that allow them to compete internationally from the outset.

Blockchain for traceability and transparency (29.3%), mentioned less frequently, represents a crucial opportunity. Elias Giordano et al. (2023) highlight that the relationship between blockchain and digital transformation improves traceability and profitability in the SME supply chain. Kolagar et al. (2022) note that a higher level of digital maturity is required for the adoption of more advanced technologies such as blockchain.

The contrast in the frequency of opportunities reveals a clear technological hierarchy: while cross-border e-commerce, big data, and cloud computing have relatively widespread adoption rates, artificial intelligence and blockchain are concentrated in specific technology sectors as they require a higher level of digital maturity. This distinction is critical for designing differentiated digital internationalization strategies based on the SME's level of technological development. SMEs in early stages of digital maturity can prioritize e-commerce and cloud computing, while those in advanced stages can explore AI and blockchain as competitive differentiators in international markets.

## 5.4 Impact of Digital Transformation on the Internationalization of SMEs

**Figure 6**

*Bar Chart Question 2 (Impact)*

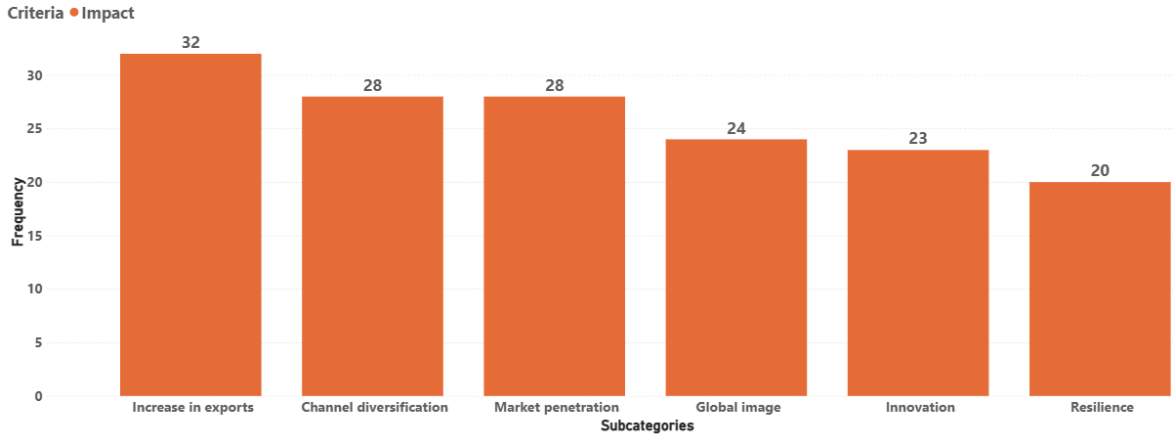



Figure 6 shows the frequency distribution of the impact of digital transformation on the internationalization of SMEs. The most common impacts were: an increase in exports (32 studies) 78.0%, market penetration (28 studies) 68.3%, and channel diversification (28 studies) 68.3%, followed by impact on global image (24 studies) 58.5%, innovation (23 studies) 56.1%, and resilience (20 studies) 48.8%.

The impact of digital transformation on the internationalization of SMEs affects various dimensions of business performance. The increase in exports and international sales (78%) represents the most frequently reported impact. Yaranga et al. (2025) demonstrate, using structural equation models, the positive relationship between the level of technology adoption and international performance. Tran et al. (2025) show that digital transformation directly impacts export performance in combination with managerial capacity and competitive pressure as crucial factors that promote digital transformation; similarly, Hardaningtyas & Sudarmiatin (2024) demonstrate that technology adoption drives the export performance of SMEs, highlighting dynamic capabilities as an essential factor for business success. Cugno et al. (2024) demonstrate that the adoption of advanced technologies has a direct impact on multiple factors related to exporting, such as export intensity and export regularity.

The penetration of new markets (68.3%) demonstrates the ability of SMEs to reach international markets. Cervantes et al. (2023) note that internationalization is considered a gradual process that the adoption of digital technologies has accelerated; the traditional

stages of the Uppsala model have been superseded by new digital approaches, such as the emergence of global digital companies. Through e-commerce and digital platforms, SMEs are able to offer their products in different markets, coordinating operations remotely and responding quickly to the demands of each market (Palma et al., 2024). Nurfaizal et al. (2025) note that the use of digital technologies and digital literacy account for 77% of the variance in access to international markets, suggesting that a company's ability to integrate into international markets depends on its digital skills and maturity. (Dallocchio et al., 2024) note that SMEs with higher levels of digital adoption have higher cross-border sales, that is, greater market penetration.

The diversification of distribution channels (68.3%) is another crucial impact. Veiga (2021) notes that the use of digital technologies streamlines internationalization processes by simplifying logistics, electronic payments, and communication with international customers. Matarazzo et al. (2020) note that digital transformation is redefining business models through new forms of internationalization via digital channels. Hardaningtyas & Sudarmiatin (2024) demonstrate that digital transformation increases SMEs' penetration of international markets and product diversification, thereby acting as a driver for the expansion of distribution channels. Ciasullo et al. (2022) note that the omnichannel strategy, together with the adoption of digital technologies, erases physical boundaries in international markets by simultaneously integrating logistics, payment systems, and customer relations. Reim et al. (2022) mention that, thanks to the adoption of digital technologies, SMEs can experiment with business models and establish flexible and scalable distribution channels.

Innovation in products and services (56.1%) emerges as a key differentiator. Jiménez et al. (2025) note that the application of digital technologies is geared toward the development of new products, services, processes, and business models, serving as the foundation for internationalization strategies. Maldonado-Cacay et al. (2023) note that innovation represents an opportunity to develop business models based on digital platforms, e-commerce, and personalization, as well as to overcome limitations of scale and resources. SMEs with a strong entrepreneurial orientation use artificial intelligence for innovation in their products and services (Hruby, 2025). (Matarazzo et al., 2020) confirms that digital transformation drives innovation in the value proposition.

The impact on global image (58.5%) arises through brand strengthening and international visibility. Ballerini et al. (2023) note that market visibility is one of the key factors that technology adoption provides to SMEs. Lee et al. (2022) demonstrate that the use of social media with international reach has a greater influence on international orientation compared to local platforms, which enhances the company's identity and image abroad.

Organizational resilience in the face of crises: 48.8% of the studies highlight this factor in the context of digital transformation and the internationalization of SMEs. Tamayo et al. (2019) highlight the importance of achieving greater digital maturity, as such companies demonstrate greater adaptability, maintaining operations even in unfavorable contexts. Cam Thuy et al. (2023) show that digital transformation acted as a buffer against the decline in exports during the COVID-19 pandemic in developing countries. Kishizada (2025) complements this finding by noting that companies that adopted a digital approach demonstrated greater resilience and flexibility. Aghazadeh et al. (2024) mention that digital resilience amplifies the effects of digital capabilities and has a greater impact on the internationalization of SMEs, enabling them to maintain operations in the face of challenges in the international environment, to complement (Kyshakevych et al. (2024) note that the adoption of technologies enables companies to withstand economic shocks and climate change, enhancing their adaptability.

These impacts confirm that digital transformation in SMEs generates effects that influence innovation, global image, and resilience that extend beyond the economic and market dimensions. Digital transformation redefines the internationalization of SMEs, enabling their sustainability and competitiveness in international markets.

## 5.5 Digital Transformation Trends in the Internationalization of SMEs

**Figure 7**

*Bar Chart Question 3 (Trends)*

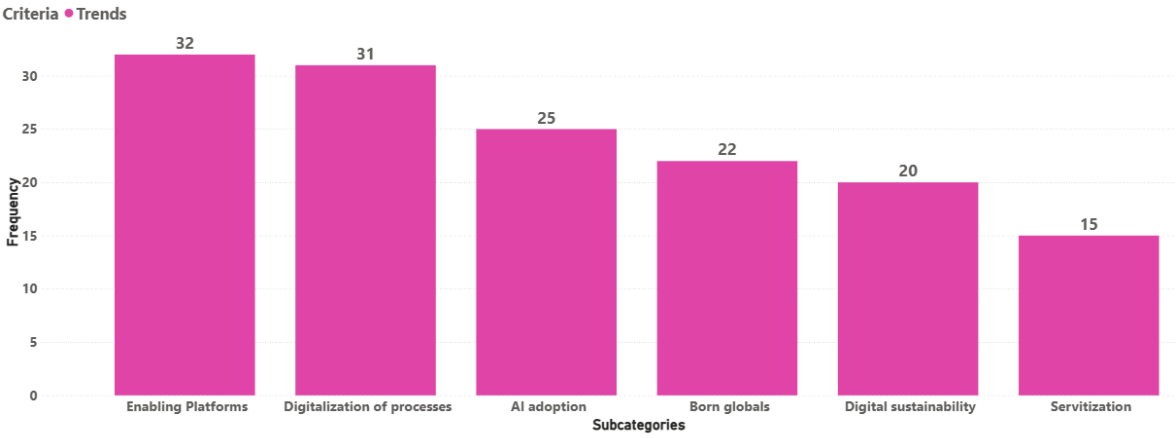



Figure 7 shows the frequency distribution of digital transformation trends in the internationalization of SMEs. The most common trends were: Enabling platforms (32 studies) 78.0%, Process digitization (31 studies) 75.6%, and AI adoption (25 studies) 61.0%, followed by Born globals (22 studies) 53.7%, digital sustainability (20 studies) 48.8%, and servitization (15 studies) 36.6%.

Digital platforms as key enablers (78%) highlight the role of digital platforms as one of the main channels for internationalization, which reduces the need for investment in proprietary infrastructure. This points to a well-established trend that redefines traditional models of internationalization. Bravo et al. (2024) and Ruiz et al. (2024) highlight the importance of digital platforms, which act as the primary channel for internationalization, reducing the need to develop proprietary infrastructure and streamlining processes. This trend suggests a growing shift toward digital platforms in internationalization. Here arises the opportunity for digital co-creation mentioned by Mohamad et al. (2022), who note that digital platforms facilitate the co-creation of value between SMEs and service providers, enabling access to international networks. Zhang et al. (2025) mention that digital platforms offset the financial limitations of SMEs by introducing a new model of global expansion.

Comprehensive process digitization (75.6%): Studies indicate a trend toward comprehensive digitization, moving beyond a simple website presence toward the transformation of all operational, commercial, and administrative processes. There is a trend toward a complete transformation of the business model. González et al. (2024) note that the process involves

redefining strategies, organizational structures, and work methods to enhance business performance. The scope of digital transformation depends on the company's capabilities, which in turn determine its outcomes; this development is achieved gradually in line with those capabilities (Sandoya et al., 2024). Rubio-Andrés et al. (2025) confirm that digital transformation impacts three organizational dimensions: economic, human resources, and internationalization.

The accelerated adoption of artificial intelligence (61%) indicates that AI will play a fundamental role in the next phase of digital transformation in SMEs, primarily for the analysis of international markets and service personalization. As predicted by Yaranga et al. (2025) and Carrasco et al. (2025), AI will play a crucial role in the digital transformation of SMEs, especially in the analysis of international markets and the personalization of offerings. Cugno et al. (2024) note that artificial intelligence is one of the technologies with the greatest growth potential, but with limited adoption.

The emergence of born-global companies (53.7%) challenges traditional models of internationalization. Cervantes et al. (2023) emphasize that the adoption of digital technologies has accelerated the traditional internationalization process of conventional models. Mäki & Toivola (2021) argue that digital disruption allows SMEs to bypass traditional processes of the Uppsala model, enabling them to reach markets without the need for prior physical investments. This trend indicates a comprehensive transformation in the nature of the internationalization process for companies. Reim et al. (2022) note that SMEs can internationalize more quickly through digital technologies without the need for a physical presence abroad.

Sustainability driven by digital technologies (48.8%); studies identify a growing interest in how the adoption of digital technologies can contribute to sustainability. Digital sustainability supports improved data management and internal processes, thereby reducing waste through the use of digital tools and platforms (Bella et al., 2024). Ekawarti et al. (2025) reinforce this perspective, noting that transformation not only drives efficiency in the supply chain and reduces waste but also serves as a vehicle for achieving the Sustainable Development Goals. Finally, Szabó et al. (2023) note that SMEs that adopt digital technologies are more sustainable and are more likely to grow in the digital age.

Digital servitization and subscription models (36.6%)—this trend transforms value creation for SMEs. It marks the shift from product-based sales models toward service-based models and customer relationships. Consequently, it creates opportunities to generate recurring revenue streams. Kolagar et al. (2022) note that the adoption of technologies drives business model innovation that supports the internationalization process; digital servitization is a shift in value creation and capture. Reim et al. (2022) note that the adoption of digital technologies enables the offering of differentiated models, such as value creation through personalized digital services and recurring revenue streams.

### 5.6 Research Gaps on Digital Transformation in the Internationalization of SMEs

**Figure 8**

*Bar Chart Question 3 (Literature Gaps)*

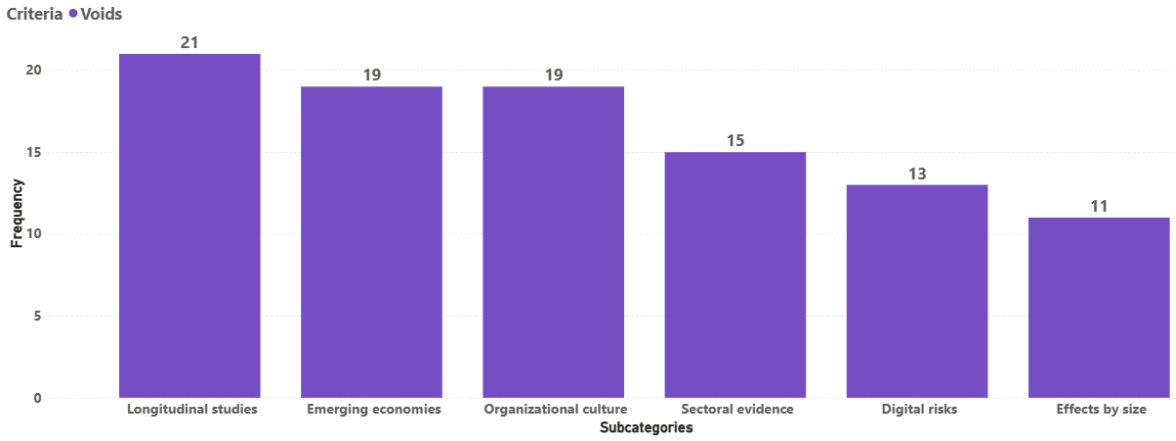



Figure 8 shows that the most common gaps in the literature were: longitudinal studies (21 studies) 51.2%, emerging economies (19 studies) 46.3%, and organizational culture (19 studies) 46.3%, followed by digital risks (13 studies) 31.7% and size effects (11 studies) 26.8%

The scarcity of longitudinal studies (51.2%) suggests a need for research that tracks SMEs over time to identify patterns and cumulative effects, noting that most studies are cross-sectional, which hinders a comprehensive understanding of the temporal evolution of the relationship between digital transformation and internationalization. As noted by Bella et al. (2024), methodological limitations include a lack of longitudinal analyses that would allow for the identification of patterns and cumulative effects. Kyshakevych et al. (2024) and Cugno et al. (2024) underscore this gap by pointing out that the cross-sectional model limits the ability to assess long-term effects.

The lack of research in emerging economies (46.3%) highlights the need for studies in these regions, as most existing research focuses on Europe and Asia (Bella et al., 2024; López et al., 2025). Arenas et al. (2025) and Guillermo et al. (2025) note that digital transformation in Latin American SMEs exhibits heterogeneous development influenced by structural factors and the institutional environment, although while it is true that there is growing interest among companies in the region in adopting technologies, gaps still exist in technological infrastructure, access to financing, and human talent capabilities, which slow down the pace at which SMEs are able to integrate into international markets. Torres et al. (2025) highlight the need for comparative studies among emerging countries. Uribe & Norman (2020) note that Colombian SMEs are constrained by limited knowledge of resources and access channels, thus calling for research on digital internationalization in Latin American contexts.

Regarding the role of organizational culture (46.3%), the articles acknowledge that a willingness to learn and openness to innovation are critical factors in the adoption of digital transformation and internationalization, thus requiring further information. Santillán (2025) notes that the mechanisms through which organizational culture relates to technology adoption and internationalization outcomes are not yet fully developed. Mollyk (2023) notes that corporate culture has negative effects on internationalization if not actively managed; he also points to a lack of research studying the mediating role of organizational culture between digital adoption and internationalization outcomes.

Digital risk management (31.7%): SMEs face more complex threats as they expand internationally. While authors such as Herrera (2024) acknowledge the importance of digital security, the literature has focused primarily on the benefits, rather than placing greater emphasis on the associated risks and vulnerabilities.

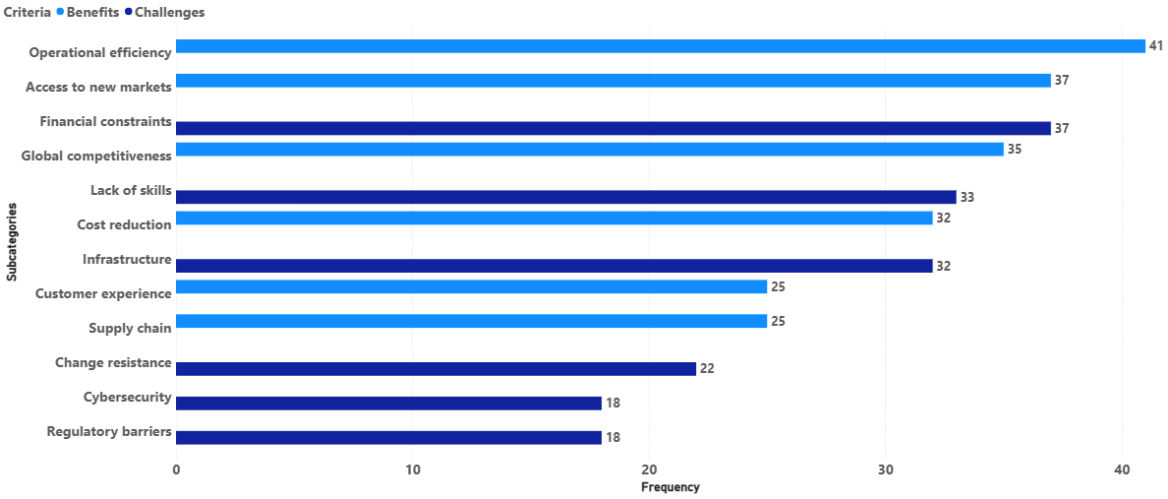
The need for studies on effects differentiated by firm size (26.8%). The differences between micro, small, and medium-sized enterprises in terms of digital adoption capacity and internationalization are not sufficiently documented. The impact of digital transformation varies greatly depending on the size of the SME; microenterprises face much greater barriers in terms of financial, human, and technological resources than medium-sized enterprises (Clemente-Almendros et al., 2024). Đeđanski et al. (2024) show that micro-enterprises face

greater difficulties with financing and digital literacy than medium-sized enterprises, suggesting the need for differentiated policies to address this challenge. Holl & Rama (2024) show that larger SMEs are more likely to adopt digital technologies, noting that the impact of digital transformation varies depending on the size of the firm. Martinčević & Kozina (2021) demonstrate significant differences in technology adoption based on firm size.

### 5.7 Contrast Between Challenges and Benefits

**Figure 9**

*Challenges versus Benefits*




The results reveal a contrast between expansion and financial constraints. This contrast is evident in the data presented: 90.2% of the articles cite access to new markets as a benefit, while 90.2% of the articles identify financial constraints as the most significant challenge. This reflects that the very potential offered by digital transformation to expand into international markets is matched by the inability of SMEs to capitalize on it due to their financial constraints. As noted by Clemente-Almendros et al. (2024), the size and limited resources of SMEs hinder investment in and implementation of new technologies, despite recognizing their strategic importance.

In the frequency analysis, we can observe that the benefits and challenges present similar data. However, the challenges carry greater structural weight because they act as enabling factors for accessing the benefits of digital transformation. Aghazadeh et al. (2024) confirm the hierarchical relationship between digital capabilities and digital resilience on one hand, and digital resources and international growth on the other. This means that the challenges

of developing digital capabilities must first be overcome; otherwise, the potential benefits remain purely theoretical.

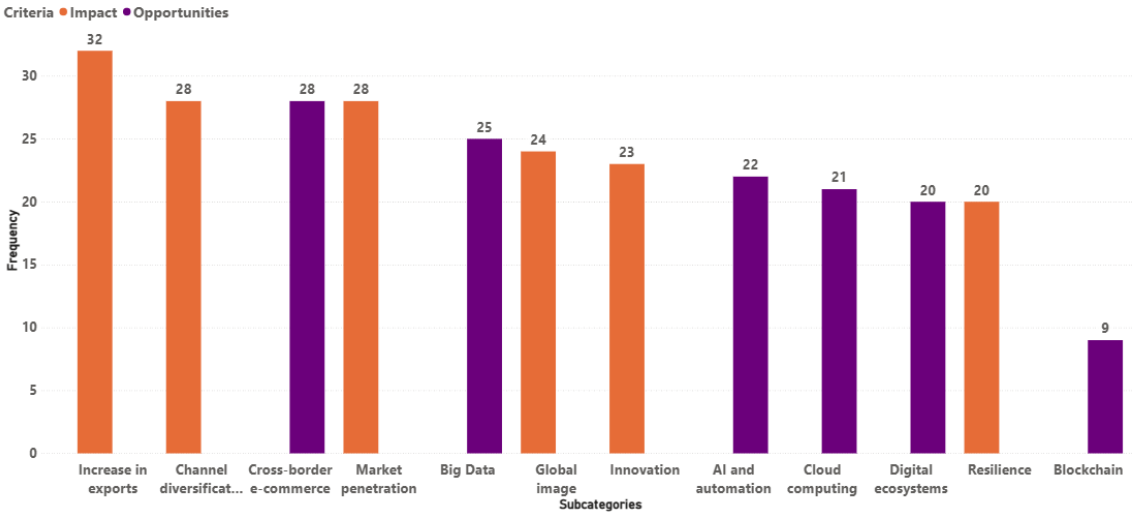
(Cam Thuy et al., 2023) note that the benefits of digital transformation are proportional to the level of prior digitization; therefore, companies that had not yet begun the process faced greater difficulties in adapting. For this reason, overcoming prior challenges is essential to determining SMEs' ability to reap benefits. Azman et al. (2025) note that digital transformation has proven to be a crucial enabler for the internationalization of SMEs; they also acknowledge that companies face significant challenges such as limited access to resources, poor digital infrastructure, a lack of digital skills, and resistance to change. Mollyk (2023) confirms that digital transformation has a positive impact on international expansion and revenue growth, but also acknowledges organizational culture as a challenge and an obstacle to internationalization. Torres et al. (2025) note that Peruvian firms face structural barriers that limit their digital transformation, even though internationalization shows a positive correlation with the level of digital adoption.

The challenges present themselves as a greater structural burden than the benefits, as they act as prerequisites; first, barriers related to financial resources, digital skills, and infrastructure must be overcome in order to access the benefits of operational efficiency and access to global markets.

### 5.8 Contrast Between Opportunities and Reported Impacts

**Figure 10**

*Opportunities versus the Reported Impact*



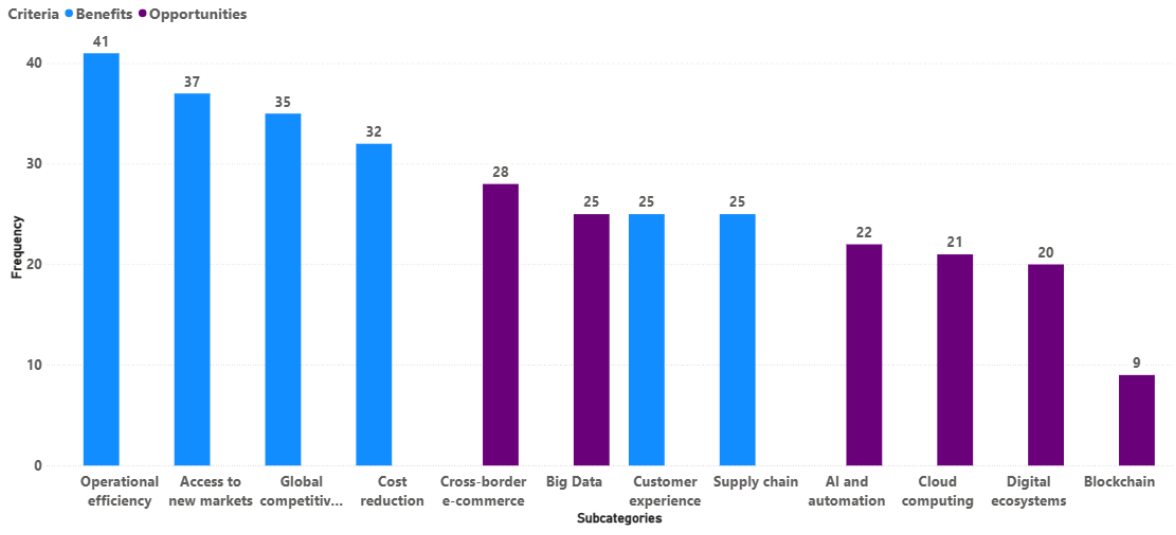
There is a notable correlation between the potential of cross-border e-commerce (68.3%) and the impacts of channel diversification (68.3%) and market penetration (68.3%), suggesting that e-commerce ensures companies' entry into and continued presence in international markets; furthermore, the increase in exports (78.0%) indicates that e-commerce is not merely a complementary tool but the primary vehicle for modern internationalization. Dallocchio et al. (2024) demonstrate that a presence on global marketplaces is far more effective than proprietary websites for international sales. Mäki & Toivola (2021) note that Finnish e-commerce SMEs achieve better results with lower capital investment, meaning that international expansion can be achieved through digital platforms. Nurfaizal et al. (2025) note that the use of digital platforms and digital literacy facilitate SMEs' access to international markets. As a result, SMEs are using digital platforms as tools to offset their lack of financial resources, enabling them to penetrate markets with significantly lower investment. The increase in exports is the result of the adoption of digital platforms, which ultimately impacts performance.

SMEs use digital platforms as strategic tools to offset their lack of financial resources, allowing them to penetrate markets with minimal investment; the increase in exports is the result of the adoption of digital platforms that impact international performance.

### 5.9 Contrast Between Benefits vs. Reported Opportunities

**Figure 11**

*Benefits versus Opportunities*



A structural relationship is observed between operating profits and the use of digital platforms; leveraging these platforms transforms the competitive capacity and international presence of SMEs. The relationship between access to new markets (90.2%) and cross-border e-commerce opportunities (68.3%) is supported by the literature review.

The results demonstrate a relationship between access to new markets (90.2%) and cross-border e-commerce opportunities (68.3%). Mäki & Toivola (2021) show that Finnish SMEs use low-investment strategies to enter global markets through e-commerce platforms. Dallocchio et al. (2024) show that a presence on marketplaces such as Amazon and Alibaba is more effective than proprietary e-commerce sites for international sales by Italian SMEs. However, there is a risk of dependence on external platforms, as mentioned by Zhang et al. (2025), who point out that while digital platforms enable internationalization, they also create dependency, leading to a loss of organizational autonomy.

Ballerini et al. (2023) add that organizational commitment and the adoption of e-commerce platforms drive business performance. Analysis of the findings reveals a relationship between operational benefits and the use of digital platforms; leveraging digital platforms transforms the competitive capacity and international reach of SMEs. However, Reim et al. (2022) note that the effective exploitation of these opportunities depends on a strategic commitment that many SMEs have not yet developed.

### 5.10 Contrast Between Opportunities and Reported Challenges

**Figure 12**

*Opportunities versus Challenges*

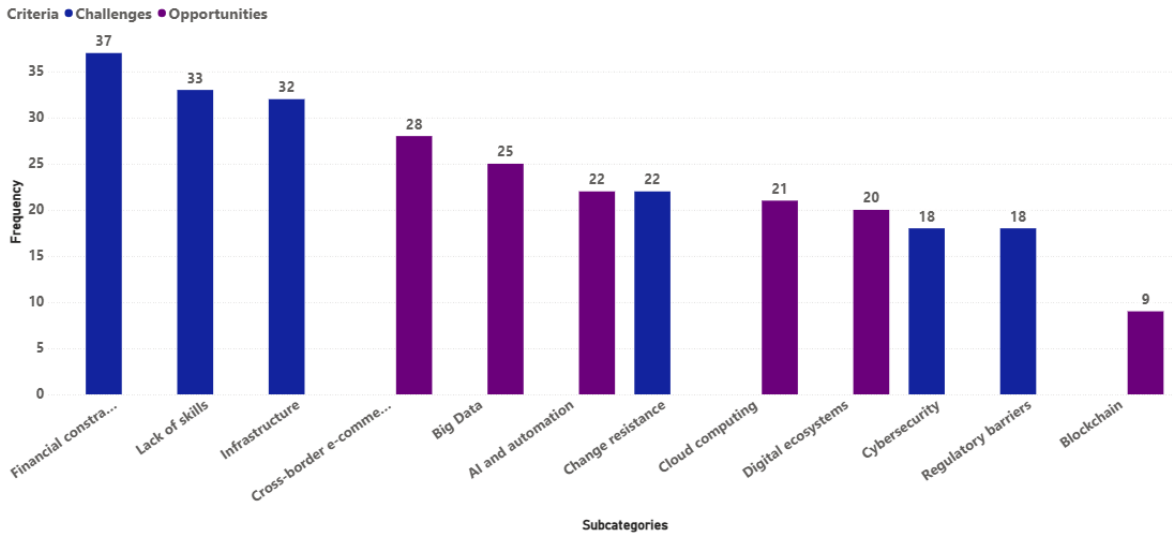


Figure 12 highlights a central pattern in the literature: digital transformation reduces barriers to entry into international markets through e-commerce (68.3%), but it does not eliminate the need for investment in organizational capabilities (lack of skills 80.5% and resistance to change 53.7%); consequently, the most common challenge is financial constraints (90.2%). Authors such as Clemente-Almendros et al. (2024) and Torres et al. (2025) note that firm size, financial resources, and human skills significantly influence the internationalization process.

Peng et al. (2025) demonstrate that digital capability is the most relevant predictor of technology adoption, implying that benefits materialize once the SME has overcome the barrier of digital competencies. This suggests that SMEs cannot reap all the benefits without developing human capital competencies.

Kolagar et al. (2022) note that an advanced level of digital maturity is required for the adoption of technologies such as blockchain, implying that the opportunity presented by blockchain (22.0%) is reserved for SMEs that have previously overcome multiple digital maturity challenges. This hierarchy—where prior challenges serve as a necessary condition for accessing opportunities—constitutes a central finding of the systematic review.

Taken together, the findings demonstrate that digital transformation in the internationalization of SMEs is neither a linear nor an immediate process, but rather a phenomenon shaped by the interplay of structural barriers, organizational capabilities, technological opportunities, and commercial impacts. Overcoming internal challenges emerges as a necessary condition for accessing benefits and opportunities. The strategic selection of technologies defines the digital internationalization trajectory of each SME; when formulating the strategy, one must consider that within the SME context, there are different realities and challenges among micro, small, and medium-sized enterprises, so the strategy must be adapted to the reality of each SME. Studies agree that SMEs that successfully overcome challenges and barriers achieve greater impacts in terms of exports, market penetration, and organizational resilience.

## 6. Discussion

The systematic literature review conducted suggests that digital transformation has evolved from a marginal strategic option into a paradigm shift for the internationalization of small and medium-sized enterprises during the 2020–2025 period. The most significant pattern emerging from the study is the universalization of operational efficiency; this should not be interpreted merely as an isolated technical improvement, but rather as the realization of a profound reconfiguration of production, distribution, and the management of organizational knowledge. Such universality indicates that digital technologies are the foundation for any successful internationalization process. This model also highlights effective access to new markets and the consolidation of sustainable competitive advantages, suggesting that the adoption of technologies is a prerequisite for ensuring successful internationalization.

A paradox emerges when comparing the benefits with the challenges faced by SMEs in their digital transition toward global markets. The similarity in frequency between these two dimensions should not be interpreted as a statistical coincidence, but rather as the primary driver of a technology adoption process, where the very tools that enable internationalization generate organizational demands that most small and medium-sized enterprises are unable to fully meet. Therefore, the reviewed literature supports the argument that digital transformation does not operate as a linear progression, but rather as a context of multiple factors in which the potential for international expansion coexists with constraints that can partially or totally nullify it. This paradox intensifies when observing that internal barriers related to digital competencies, resistance to change, and financial limitations are significantly determinative in the digital transformation process. The main barrier does not lie in the absence of favorable external conditions, but rather in the inability of organizations to absorb, adapt, and leverage available technologies, creating digital maturity gaps that segment the SME landscape.

Overall, the technological hierarchy identified in the study reveals a structural duality. On the one hand, e-commerce and digital marketplace platforms appear to be widely adopted technologies, with adoption rates suggesting their consolidation as a basic infrastructure for today’s globalization; on the other hand, more sophisticated technologies such as artificial intelligence, blockchain, and integrated digital ecosystems exhibit lower adoption rates, implying a differentiated distribution shaped by prior digital maturity, the availability of

specialized resources, and sector-specific complexity. This duality suggests that there are two phases of digital transformation in the context of SMEs: a first phase focused on commercial and operational digitization, accessible to the majority, and a second phase focused on predictive intelligence and integration into digital ecosystems, reserved for a minority with advanced capabilities.

This technological segmentation has implications for the theory of internationalization, which challenges the idea of a single trajectory and suggests the existence of differentiated paths that depend critically on each company's digital starting point. Projections regarding trends such as the emergence of digital born-globals and the servitization of traditional offerings should not be generalized as a trend for all SMEs, but rather as an outcome achievable only for those organizations that successfully navigate the preliminary stages of digital maturity.

The prevalence of trends toward comprehensive digitalization and the adoption of enabling platforms can be interpreted as a paradigm shift in internationalization for SMEs. Digital transformation is driving a shift toward a networked model of internationalization, where membership in digital ecosystems and the ability to operate on global platforms are crucial. However, fundamental questions arise regarding the strategic autonomy of SMEs in the face of the concentration of power in technology platforms.

The relationship between the findings of this systematic review and the classical theoretical frameworks of internationalization reveals tensions in the literature. With regard to the Uppsala model, studies suggest that digital transformation does not completely invalidate the sequential process of internationalization, but it has reduced and redefined it. While the traditional model posited a sequential progression from sporadic exports toward more committed forms of presence abroad, mediated by experiential learning and the gradual reduction of psychological distance, digital transformation enables accelerated leaps that shorten the time to enter international markets. However, this reduction does not imply the disappearance of the sequential process, but rather its evolution. Psychological distance is no longer reduced solely through progressive physical presence, but also through digital technology generated via e-commerce platforms, social media, and communication tools. This transformation raises the question of whether the concept of psychological distance remains useful for explaining current reality, when interaction with customers, suppliers, and

competitors takes place in digital environments, where information is accessible almost instantly and costs have been reduced. The reviewed literature suggests that digital SMEs experience a duality: they can internationalize more quickly, but they also fail more rapidly if they lack the absorptive capacities necessary to manage the complexity of multiple markets.

With regard to born-global companies and digital companies that internationalize early, while there is a growing trend toward digital born-globals, the literature suggests that their prevalence is relatively marginal within the context of SMEs, being concentrated primarily in technology sectors and institutional contexts with mature digital entrepreneurship ecosystems. Therefore, a widespread paradigm shift toward early internationalization cannot be assumed to be an inevitable endpoint, but rather an alternative path that will coexist for an extended period with the redefined Uppsala model.

The evidence suggests that SMEs do not transform all their processes uniformly or instantly, but rather take partial and poorly coordinated paths. Some organizations advance in technology adoption without transforming their production processes; others invest in technological infrastructure without developing complementary human skills. Consequently, this fragmentation of digital maturity largely explains why some potential benefits do not materialize as much as others and why internal challenges prove more decisive than external ones. Fragmentation also calls into question the validity of traditional digital maturity models, which assume an orderly and cumulative progression, when empirical evidence suggests less predictable trajectories dependent on the business context. The literature suggests a progressive sequence that begins with the consolidation of digital channels, continues with the adoption of cloud infrastructure, then moves toward the use of large volumes of data for market decision-making, and is reserved only for those organizations with a solid foundation in the implementation of artificial intelligence aimed at predicting global consumer behavior and optimizing supply chains. However, business practice rarely follows this sequence in its pure form, meaning that recommendations must be tailored to the specific contexts of each company (Martinčević & Kozina, 2020).

The literature highlights the need for approaches differentiated by company size, recognizing that microenterprises, small businesses, and medium-sized enterprises face distinct constraints, demands, and potential. The homogenization of these needs is one of the main

causes of the persistent gap between technological potential and strategic implementation in SMEs.

Digital transformation for internationalization is not merely a technology project with commercial objectives, but rather a profound organizational process of change that shapes internal structure, required competencies, and value creation. The resistance to change identified in the literature should not be treated as an obstacle to be eliminated through training, but rather as a mismatch between the pace of technology adoption and the company's internal processing capacity. Studies suggest that SMEs that successfully navigate digital transformation are those capable of managing the cultural dimension, integrating human capital into digital transformation pathways, and aligning technology with organizational objectives.

On the other hand, the first methodological gap lies in the predominance of cross-sectional studies mentioned in the literature, which prevents the establishment of causal relationships between digital transformation and internationalization outcomes. This means that most of the analyzed articles capture the relationship between variables at a specific point in time, and therefore cannot be interpreted as evidence of actual dynamic processes. Digital transformation in internationalization is a longitudinal process, where technology adoption decisions made during a given period generate deferred and cumulative effects; thus, the absence of longitudinal studies constitutes a limitation that constrains the explanatory power of the current state of research.

Furthermore, the review reveals geographical biases that undermine the generalizability of the findings to diverse business contexts. The predominance of studies from East Asia and Western Europe paints a picture of digital transformation in SMEs undergoing internationalization that does not adequately reflect the reality of emerging markets and developing economies. The absence of studies from Latin America, Africa, and Central Asia constitutes a representativeness bias that limits the applicability of the conclusions to contexts where institutional constraints, infrastructure asymmetries, and cultural particularities would impact the identified relationships.

Finally, segmentation by firm size requires research that goes beyond the homogeneous category of SMEs to distinguish between microenterprises, small enterprises, and medium-

sized enterprises, recognizing that their trajectories regarding digital adoption levels, financial constraints, access to specialized talent, and technological absorption capabilities differ. Current studies group these three segments into a single category, generating generalized conclusions that obscure critical heterogeneities. Furthermore, the dimension of digital risks emerges as a field of research that requires a more in-depth approach, in a context where SMEs increasingly depend on shared digital infrastructures, third-party platforms, and cross-border data flows.

The literature reviewed highlights market opportunities, operational benefits, and scalability potential, while cybersecurity risks, vulnerabilities related to technological dependence, costs, and power imbalances within digital platform ecosystems are also noted. Furthermore, the difficulty in generalizing findings across different business contexts emerges as a limitation; regulatory conditions, levels of digital infrastructure development, the density of innovation ecosystems, and organizational cultures vary to such an extent that the same set of digital technologies can generate opposite effects in different environments. The cross-sectional designs in the literature are insufficient to capture the delayed effects, cumulative feedback loops, and inflection points that characterize the actual processes of technology adoption in micro, small, and medium-sized enterprises.

## 7. Conclusions

This systematic literature review, structured in accordance with the PRISMA 2020 protocol, has established that digital transformation is a multidimensional phenomenon that is redefining the internationalization processes of small and medium-sized enterprises.

The main findings reveal that the benefits associated with the adoption of digital technologies in the international context are significant and widely documented in the scientific literature, encompassing dimensions ranging from operational efficiency to access to international markets, global competitiveness, and cost reduction. However, these benefits do not materialize automatically or uniformly, as they are conditioned by a set of internal barriers that act as prerequisites determining the firm's actual capacity to capitalize on opportunities in the digital environment. The evidence suggests that the impact of digital transformation on internationalization is heterogeneous, varying according to firm size, sector, geographic region, and the firm's prior level of digital maturity. These results suggest that digital transformation is an enabler whose effectiveness depends on the articulation

between organizational capabilities, technological resources, and specific contextual conditions.

The overarching research question guiding this study concerns the key benefits, challenges, and opportunities of digital transformation in the internationalization of SMEs, and how this process helps identify its application, impact, and future trends.

First, the benefits identified in the analyzed literature suggest that digital transformation offers operational and strategic advantages for SMEs in international markets. One of the most frequently reported benefits is operational efficiency, followed by access to global markets and the reduction of geographical barriers, as well as digital platforms and cross-border e-commerce channels that facilitate access to international customers with minimal initial investment. Similarly, improved global competitiveness and cost reduction were identified in the literature. However, these benefits are limited by the challenges identified in the literature; thus, financial barriers, limitations in digital skills, inadequate technological infrastructure, and resistance to organizational change were documented as the main obstacles limiting SMEs in their internationalization process. Internal challenges are their main limitation in adopting digital transformation; thus, the barriers lie within the companies themselves rather than in institutional or regulatory environments, making organizational capabilities a mediating variable in the digital transformation process.

Second, the strategic opportunities identified in the literature open up a world of possibilities for SMEs. Cross-border e-commerce, the use of big data for market intelligence, the adoption of artificial intelligence-based solutions, the migration to cloud computing infrastructures, participation in collaborative digital ecosystems, and the exploration of blockchain applications enable SMEs to overcome the scale limitations that have historically characterized this business segment, facilitating accelerated internationalization models that challenge classical theories of the gradual model.

Third, the impact of digital transformation on the internationalization of SMEs has been characterized in the literature as a multidimensional phenomenon that goes beyond commercial factors. Increased exports, penetration into new markets, diversification of distribution channels, a boost to product and process innovation, and the strengthening of organizational resilience were reported as the main effects. However, these impacts are

neither immediate nor linear, as they depend on the company's prior level of digital maturity, which establishes a critical threshold below which the benefits do not materialize. Therefore, the prior level of digital adoption is directly related to the impacts on internationalization.

Fourth, regarding future trends, the reviewed literature points toward a comprehensive digitization of business processes, the proliferation of digital platforms as a pathway to internationalization, the consolidation of artificial intelligence as a central strategic tool, the emergence of digital born-globals that internationalize from their inception, the incorporation of sustainability criteria into digital internationalization models, and the transition toward servitization models that combine digital goods and services. These trends suggest that the field is in a phase of transition toward a new paradigm of internationalization, where the digital dimension will become the strategic model for internationalization.

Finally, regarding gaps in the literature, the reviewed literature points to the predominance of cross-sectional methodological designs that limit the ability to establish longitudinal causal relationships, as well as a marked geographical asymmetry concentrated in digital powerhouses that does not reflect the reality of Latin America, Africa, and Asia.

The three specific objectives that guided the methodological development of this research were met, ensuring the study's rigor and replicability. The first objective—establishing a PRISMA 2020 protocol—was achieved by drafting a protocol document that defined the inclusion and exclusion criteria, information sources, and selection procedures, thereby ensuring the study's transparency. The second objective, focused on conducting a search and analysis of the scientific literature, was achieved by consulting five international academic databases (Scopus, Redalyc, Web of Science, Dimensions, and Lens); the application of advanced search strings with Boolean operators and the execution of a screening process allowed for the identification and final selection of forty-one scientific articles. The third objective, focused on interpreting and synthesizing the results and conducting a critical analysis, was achieved by constructing a synthesis matrix with six data extraction criteria, which allowed for the organization of information, the identification of patterns, the comparison of findings, and the generation of a critical analysis.

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Yu, H., Fletcher, M., & Buck, T. (2022). Managing Digital Transformation During Reinternationalization: Trajectories and Performance Implications. *Journal of International Management*, *28*(4). https://doi.org/10.1016/j.intman.2022.100947

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# 9. Appendices

## Appendix 1

*Literature Review Matrix of Articles*

| No. | Base Data | Authors | Year | Title | Country | Language | Contents |
|---|---|---|---|---|---|---|---|
| 1 | Scopus | Nurfaizal, Y.; Kurniawan, A.A.; Hermawan, H.; Saputra, D.I.S.; Amalina, S.N.; Hafshah, L.N. | 2025 | Use of Digital Platforms and ICT Literacy in Global Market Access among MSMEs: The Mediating Role of Digital Business Readiness and the Moderating Effect of Government Support | Indonesia | English | Platform use, ICT literacy, digital readiness, government support and access to the global market. |
| 2 | Scopus | Radovic-Markovic, M.M.; Srebro, B.; Dedjanski, S.; Vrbanac, M. | 2025 | Gender Perspectives on International Trade and SME Incomes in the Digital Age: Evidence from Serbia | Serbia | English | Company ownership (gender), business environment, digital transformation, and export performance/revenue. |
| 3 | Scopus | Batuparan, D.S.; Wahyuni, S.; Sudhartio, L. | 2025 | Innovation in business models and digitalisation in the internationalisation of SMEs: the mediating role of the internationalisation process | Indonesia | English | Business model innovation (BMI), digitalization, internationalization process and international performance. |
| 4 | Scopus | Dallocchio, M.; Lambri, M.; Sironi, E.; Teti, E. | 2024 | The role of digitalisation in the cross-border e-commerce performance of Italian SMEs | Sweden | English | Interaction processes, partners, atmosphere of relationship and internationalization. |
| 5 | Scopus | Ciasullo, M.V.; Montera, R.; Mercuri, F.; Mugova, S. | 2024 | When digitalization meets omnichannel in international markets: a case study from the agri-food industry | Italy | English | Cross-border e-commerce (CBEC), e-business capabilities and e-marketing tools (CRM, social media). |
| 6 | Scopus | Martinčević, I.; Kozina, G. | 2020 | Influence of digital technologies and their technological dynamics on business management | Canada | English | Online presence, ICT resources, cybersecurity practices and international vs. domestic online sales. |
| 7 | Scopus | Martinčević, I.; Kozina, G. | 2020 | The relationship between the technological dynamics of new technologies and the absorptive capacity of exporting enterprises in the Republic of Croatia | Croatia | English | Technological dynamics of new technologies and the absorption capacity of these technologies. |
| 8 | WOS | Reim, W; Yli-Viitala, P; Arrasvuori, J; Parida, V | 2022 | Addressing the challenges of the business model in the internationalization of SMEs through digitalization | Sweden and Finland | English | Business model challenges, internationalization, creation and capture of digital value. |
| 9 | WOS | Clemente-Almendros, JA; Nicoara-Popescu, D; Pastor-Sanz, I | 2024 | Digital transformation in SMEs: understanding its determinants and size heterogeneity | Spain | English | Digital transformation, manager education, company size, degree of internationalization. |
| 10 | WOS | Zhang, C; Bai, T; Zhou, AJ; Zhou, SS | 2025 | Digital platforms, internal digitalisation and internationalisation of SMEs | China | English | Internationalization, commercial and social platforms, internal digitalization. |
| 11 | WOS | Peng, FY; Yusoff, YM; So, the Institute | 2025 | The Determinants of Cross-Border E-Commerce Adoption in SMEs: A Resource-Based View | China | English | Cross-border e-commerce, business resources, internationalization. |
| 12 | WOS | Torres, JMA; Lent, JRM; Nonones, AJG; Soldevilla, OAL; Esquivel, MJC; Berrocal, JYP; Estela, AGG | 2025 | Factors influencing the digitalization process of Peruvian SMEs: management training, internationalization and business size | Peru | English | Digitalization, management education, internationalization, business size. |
| 13 | WOS | Mäki, M; Toivola, T | 2021 | Global market entry for Finnish e-commerce SMEs | Finland | English | E-commerce, internationalization, global market entry, digital disruption. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 14 | WOS | Kolagar, M; Reim, W; Parida, V; Sjödin, D | 2022 | Digital servitization strategies for the internationalization of SMEs: the interaction between the maturity of digital services and the involvement of the ecosystem | Sweden | English | Digital servitization, internationalization, maturity of digital services, participation in ecosystems. |
| 15 | WOS | Mohamad, A; Rizal, AM; Kamarudin, S; Sahimi, M | 2022 | Exploring the co-creation of small and medium-sized enterprises, and service providers enabled by interactive digital platforms for internationalization: a case study in Malaysia | Malaysia | English | Co-creation of value, interactive platforms, internationalization, suppliers. |
| 16 | WOS | Ballerini, J; Herhausen, D; Ferraris, A | 2020 | How Platform Engagement and Adoption Drive SMB E-Commerce Performance: A Mixed-Methods Investigation into the Possibilities of Ecommerce | Italy, Albania, Montenegro | English | Innovation, digital revolution, R+D, ICT technologies. |
| 17 | WOS | Hruby, V | 2024 | Entrepreneurial Orientation in the Age of Artificial Intelligence: A Study of SMEs in the Visegrad Chemical Sector | Europe | English | Digitalization, geographical location, adoption of technology (AI, Cloud, Robotics). |
| 18 | WOS | Lee, JY; Yang, YS; Ghauri, PN; Park, BI | 2023 | The impact of experience in social networks and digital platforms on the international orientation of SMEs: the moderating role of | Global | English | E-commerce commitment, platform adoption, internationalization, performance. |
| 19 | WOS | Holl, A; Rama, R | 2022 | Spatial patterns and factors driving the digitalisation of SMEs | China | English | International orientation, use of foreign/national networks and platforms. |
| 20 | LENS | Luis Armando González Arellano; Elizabeth Acosta-Gonzaga | 2021 | Dynamic Management Capabilities of SME Managers in the Adoption of National and Cross-Border E-Commerce | Mexico | Spanish | Dynamic management capabilities, national and cross-border e-commerce, adoption barriers. |
| 21 | LENS | Nguyen Cam Thuy; Luong Van Dat; Do Phu Dong; Vu Thuy Linh; Doan Ngoc Thang | 2023 | Is digital transformation an obstacle to export reduction during COVID-19? The case of a developing country | Vietnam | English | Digital transformation, exports. |
| 22 | LENS | null Ratna Tri Hardaningtyas; null Sudarmiatin Sudarmiatin | 2024 | Digital Transformation and Export Performance: An Analysis of Panel Data on Indonesian MSMEs' International Market Penetration | Indonesia | English | Digital transformation, export performance, organizational capabilities. |
| 23 | LENS | Stevica Đađanski; Boris Jevtić; Radmila Grozdanić | 2024 | DIGITAL TRANSFORMATIONS SHAPING THE INTERNATIONALIZATION OF SMES - SERBIAN CASE | Serbia | English | Digitalisation of SMEs, digital ecosystem, internationalisation. |
| 24 | LENS | Bohdan Kyshakevych; Natalia Maksyshko; Kostiantyn Hrytsenko; Iván Voronchak; Bohdan Demediuk | 2024 | ANALYSIS OF THE EFFICIENCY OF DIGITALISATION IN SMALL AND MEDIUM-SIZED ENTERPRISES IN EU COUNTRIES USING DEA MODELS | EU | English | Digital intensity, use of cloud, e-commerce. products, exports. |
| 25 | LENS | El Tuan Tran; Khanh Tran; Do Thi Tho | 2025 | The impact of innovation-driven digital transformation on the export performance of SMEs | Vietnam | English | Digital transformation, export performance, management capacity, corporate culture. |
| 26 | LENS | null Muhammad Tody Arsyianto; null Budi Eko Soetjipto | 2025 | Improving the international competitiveness of SMEs through machine learning-driven market analysis: a mixed-methods approach | Indonesia | English | Technological capacity, market intelligence (Machine Learning), global competitiveness, export volume |
| 27 | LENS | Cynthia Carola Elias Giordano; Gianluca Jesús Di Marco Nader; Editha Dueñas Azañero; Jon Arambarri; José Antonio Rojas García | 2023 | Methodology to increase the profitability of a Peruvian agro-export company by improving the sales process using Blockchain and Digital Transformation methodologies. | Peru | English | Profitability, Blockchain, Big Data, sales processes, traceability, Digital Transformation |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 28 | LENS | Yuni Ekawarti; Kristian Chandra; null Malalina | 2025 | Digital transformation and the 3c business model to achieve the Sustainable Development Goals: paths to export competitiveness for food SMEs | Indonesia | English | Digital transformation, competitive advantage, export competitiveness |
| 29 | LENS | Plaza Néstor; Mayra Moreno | 2024 | Main competitive advantages of SMEs when using digital media in Ecuador's imports and exports | Ecuador | Spanish | Digital media, imports and exports, competitive advantages, customs efficiency. |
| 30 | LENS | Roland Z. Szabó; Borbála Szedmák; Anna Tajti; Péter Bera | 2023 | Environmental sustainability, digitalisation and the entrepreneurial perception of distances as drivers of the internationalisation of SMEs | | English | Environmental sustainability, digital systems (ERP, CRM), perception of distances, export. |
| 31 | LENS | Monica Cugno; Rebecca Castagnoli; Giacomo Büchi; Marco Pini | 2025 | Effects of Industry 4.0 on different export dimensions: empirical analysis in manufacturing SMEs | Italy | English | Industry 4.0 technologies, export status, regularity and intensity of export. |
| 32 | Dimensions | Yu, Honglan; Fletcher, Margaret; Buck, Trevor | 2022 | Managing Digital Transformation During Reinternationalization: Trajectories and Performance Implications | China | English | Digital transformation (strategic vs. operational), re-internationalization, new product development, international performance. |
| 33 | Dimensions | MATARAZZO, MICHELA; PENCO, LARA; PROFUMO, GIORGIA | 2021 | How is digital transformation changing business models and internationalization in Made in Italy SMEs? | Italy | English | Digital transformation, business model innovation, internationalization, customer value creation. |
| 34 | Dimensions | Rubio-Andrés, Mercedes; Linuesa-Langreo, Jorge; Gutiérrez-Broncano, Santiago; Sastre-Castillo, Miguel Ángel | 2024 | Addressing Digital Transformation Strategy: How It Affects Business Innovation and Organizational Effectiveness | Spain | English | Digital transformation strategy, business innovation, organizational effectiveness. |
| 35 | Dimensions | Azman, Noor Azura; Abd Rani, Shamsul Huda; Hasnan, Norlena; Mustafa Kamil, Bidayatul Akmal | 2025 | Digital Transformation as a Driver of Internationalization: A Study of Malaysian SMEs in the Manufacturing Industry | Malaysia | English | Digital transformation, internationalization, productivity, responsiveness and global competitiveness. |
| 36 | Dimensions | Aghazadeh, Hashem; Zandi, Farzad; Mahdiraji, Hannan Amoozad; Sadraei, Razieh | 2023 | Digital transformation and internationalisation of SMEs: digital transformation and internationalisation of SMEs: unraveling the role of moderate mediation of digital skills, digital resilience and digital maturity | Iran | English | Data provider, digital leadership, digital platform capabilities, digital resilience, international growth, business model maturity. |
| 37 | Dimensions | Mollyk, Dante Ramírez | 2023 | Do digital technologies level the playing field for the internationalization of SMEs in LATAM? How digital technologies have changed internationalization strategies | Latin America | English | Digital transformation (maturity, digitalization), internationalization (revenue growth, expanded countries), company culture. |
| 38 | Dimensions | Kishizada, Tural | 2025 | Strategic adaptation of companies in changing economic conditions: a quantitative analysis based on the impact of COVID-19 | Azerbaijan | English | Change of strategic direction, digital transformation, international practices and company size |
| 39 | Dimensions | Biea, Elena Adriana; Ciuciuc, Victor | 2025 | From strategy and practice to organisational success in internationalisation: a qualitative approach | Romania | English | B2B management strategies and practices, digitalization-driven competitiveness, and organizational performance. |
| 40 | Redalyc | Aura Uribe Arévalo, Eduardo Norman Acevedo | 2020 | The internationalization of the small and medium-sized software and information technology (SW&IT) industry through the springboard effect of the guild | Colombia | Spanish | Internationalization, software and ICT industry, networks, SMEs. |
| 41 | Redalyc | Omar Alexander Leon Garcia, Eliana Rocio Baez Landeros | 2020 | Analysis of the relationship between IT technologies and Industry 4.0 with internationalization and business performance | Colombia | English | Information Technology (IT), Industry 4.0, Internationalization, Business Performance. |

## Appendix 2

*Data Extraction Matrix for Question 1*

| N° | Document (Title) | What are the key benefits, challenges and opportunities of digital transformation in internationalization for SMEs, according to the scientific literature (2020-2025)? | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Benefits | | | | | | Challenges | | | | | | Opportunities | | | | | |
| | | New Access Markets | Reduction Costs | Efficiency Operational | Competitiveness global | Chain Supply | Experience Customers | Limitations financial | Missing Competencies | Resistance Change | Infrastructure | Barriers regulatory | Cybersecurity | E-commerce Cross-border | Big Data | AI and Automation | Blockchain | Cloud Computing | Ecosystems digital |
| 1 | Analyzing the Efficiency of Digitalization in SMEs... | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| 2 | Analysis of the Relationship Between IT and Indust... | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 |
| 3 | When Digitalization Meets Omnichannel in Internati... | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 4 | The Role of Digitalization in Cross-Border E-Comme... | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 |
| 5 | The Relationship Between Technological Dynamics of... | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| 6 | The Impact of Social Media and Digital Platforms E... | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 |
| 7 | The Impact of Innovation-Driven Digital Transforms... | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 1 |
| 8 | The Determinants of Cross-Border E-Commerce Adopti... | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| 9 | Tackling Digital Transformation Strategy: How It A... | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 10 | Tackling Business Model Challenges in SME Internat... | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| 11 | Strategic Adaptation of Enterprises in Changing Ec... | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| 12 | Spatial Patterns and Drivers of SME Digitalisation | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 |
| 13 | Main Competitive Advantages of SMEs at the ... | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 14 | Methodology to Increase the Profitability of a Per... | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 15 | Managing Digital Transformation During Re-internat... | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 16 | The Internationalization of Small and Medium-Sized Industries | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 |
| 17 | Is Digital Transformation a Barrier to Export Redu... | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 18 | Influence of Digital Technologies and Its Technolo... | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 19 | How is Digital Transformation Changing Business Mo... | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 |
| 20 | How Commitment and Platform Adoption Drive the E-C... | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 21 | Global Market Entry for Finnish SME eCommerce Comp... | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 |
| 22 | Gender Perspectives on SME International Trade and... | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 |
| 23 | From Strategy and Practice to Organizational Succe... | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 |
| 24 | Factors Influencing the Digitization Process of Pe... | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 |
| 25 | Exploring the Co-Creation of SMEs and Service Prov... | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 |
| 26 | Environmental Sustainability, Digitalisation, and ... | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| 27 | Entrepreneurial Orientation in the Age of Artifici... | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 |
| 28 | Enhancing International SME Competitiveness throug... | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 29 | Effects of Industry 4.0 on Different Export Dimens... | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 |
| 30 | Do Digital Technologies Level the Playing Field fo... | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 |
| 31 | Digital Transformations Shaping SME Internationali... | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | Digital Transformation in SMEs: Understanding Its ... | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 33 | Digital Transformation as a Driver for International... | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 |
| 34 | Digital Transformation and the 3C Business Model f... | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| 35 | Digital Transformation and SME Internationalisatio... | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 |
| 36 | Digital Transformation and Export Performance: A P... | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 1 |
| 37 | Digital Servitization Strategies for SME Internati... | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 |
| 38 | Digital Platforms, Internal Digitalization, and In... | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| 39 | Digital Platform Utilization and ICT Literacy on G... | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 |
| 40 | Dynamic Management Capabilities of Managers | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 |
| 41 | Business Model Innovation and Digitalization in SM... | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| | Results | 37 | 32 | 41 | 35 | 25 | 25 | 37 | 33 | 22 | 32 | 18 | 18 | 28 | 25 | 22 | 9 | 21 | 20 |

## Appendix 3

*Data Extraction Matrix for Question 2*

| N° | Document (Title) | How does this process of digital transformation in SME allows you to identify its application and impact? | | | | | |
|---|---|---|---|---|---|---|---|
| | | Impact | | | | | |
| | | Increase Exports | Penetration Markets | Diversification channels | Image global | Innovation | Resilience |
| 1 | Analyzing the Efficiency of Digitalization in SMEs... | 1 | 1 | 1 | 0 | 1 | 0 |
| 2 | Analysis of the Relationship Between IT and Indust... | 1 | 1 | 1 | 1 | 1 | 1 |
| 3 | When Digitalization Meets Omnichannel in Internati... | 0 | 1 | 1 | 1 | 1 | 0 |
| 4 | The Role of Digitalization in Cross-Border E-Comme... | 1 | 1 | 1 | 0 | 0 | 0 |
| 5 | The Relationship Between Technological Dynamics of... | 1 | 1 | 0 | 1 | 1 | 0 |
| 6 | The Impact of Social Media and Digital Platforms E... | 1 | 1 | 0 | 0 | 1 | 1 |
| 7 | The Impact of Innovation-Driven Digital Transforms... | 1 | 0 | 1 | 0 | 0 | 1 |
| 8 | The Determinants of Cross-Border E-Commerce Adopti... | 1 | 1 | 1 | 1 | 0 | 1 |
| 9 | Tackling Digital Transformation Strategy: How It A... | 1 | 0 | 0 | 1 | 1 | 0 |
| 10 | Tackling Business Model Challenges in SME Internat... | 1 | 1 | 1 | 1 | 1 | 0 |
| 11 | Strategic Adaptation of Enterprises in Changing Ec... | 1 | 1 | 1 | 1 | 1 | 1 |
| 12 | Spatial Patterns and Drivers of SME Digitalisation | 1 | 1 | 1 | 1 | 1 | 0 |
| 13 | Main Competitive Advantages of SMEs at the ... | 1 | 0 | 0 | 0 | 1 | 1 |
| 14 | Methodology to Increase the Profitability of a Per... | 1 | 1 | 1 | 0 | 0 | 1 |
| 15 | Managing Digital Transformation During Re-internat... | 0 | 1 | 1 | 1 | 1 | 0 |
| 16 | The Internationalization of Small and Medium-Sized Industries | 1 | 1 | 1 | 1 | 1 | 1 |
| 17 | Is Digital Transformation a Barrier to Export Redu... | 1 | 1 | 1 | 1 | 1 | 1 |
| 18 | Influence of Digital Technologies and Its Technolo... | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 | How is Digital Transformation Changing Business Mo... | 0 | 0 | 1 | 0 | 0 | 0 |
| 20 | How Commitment and Platform Adoption Drive the E-C... | 0 | 0 | 0 | 1 | 0 | 0 |
| 21 | Global Market Entry for Finnish SME eCommerce Comp... | 0 | 0 | 0 | 1 | 0 | 1 |
| 22 | Gender Perspectives on SME International Trade and... | 1 | 1 | 1 | 0 | 1 | 0 |
| 23 | From Strategy and Practice to Organizational Succe... | 1 | 0 | 0 | 1 | 0 | 0 |
| 24 | Factors Influencing the Digitization Process of Pe... | 1 | 1 | 1 | 1 | 0 | 1 |
| 25 | Exploring the Co-Creation of SMEs and Service Prov... | 0 | 1 | 0 | 1 | 0 | 0 |
| 26 | Environmental Sustainability, Digitalisation, and ... | 0 | 0 | 1 | 1 | 0 | 0 |
| 27 | Entrepreneurial Orientation in the Age of Artifici... | 1 | 1 | 1 | 0 | 1 | 0 |
| 28 | Enhancing International SME Competitiveness throug... | 1 | 1 | 0 | 0 | 0 | 1 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 29 | Effects of Industry 4.0 on Different Export Dimens... | 1 | 0 | 1 | 1 | 1 | 1 |
| 30 | Do Digital Technologies Level the Playing Field fo... | 1 | 1 | 1 | 0 | 1 | 1 |
| 31 | Digital Transformations Shaping SME Internationali... | 1 | 1 | 0 | 0 | 1 | 0 |
| 32 | Digital Transformation in SMEs: Understanding Its ... | 1 | 1 | 1 | 0 | 1 | 1 |
| 33 | Digital Transformation as a Driver for International... | 1 | 1 | 1 | 1 | 0 | 1 |
| 34 | Digital Transformation and the 3C Business Model f... | 1 | 1 | 1 | 1 | 1 | 1 |
| 35 | Digital Transformation and SME Internationalisatio... | 1 | 1 | 1 | 1 | 0 | 1 |
| 36 | Digital Transformation and Export Performance: A P... | 1 | 0 | 0 | 1 | 1 | 0 |
| 37 | Digital Servitization Strategies for SME Internati... | 1 | 1 | 1 | 0 | 0 | 1 |
| 38 | Digital Platforms, Internal Digitalization, and In... | 0 | 1 | 1 | 0 | 1 | 0 |
| 39 | Digital Platform Utilization and ICT Literacy on G... | 1 | 0 | 0 | 0 | 0 | 1 |
| 40 | Dynamic Management Capabilities of Managers | 1 | 1 | 1 | 1 | 1 | 0 |
| 41 | Business Model Innovation and Digitalization in SM... | 1 | 0 | 1 | 1 | 0 | 0 |
| | Results | 32 | 28 | 28 | 24 | 23 | 20 |

## Appendix 4

*Data Extraction Matrix for Question 3*

| No. | Document (Title) | What are the future trends of digital transformation in the context of the internationalization of SMEs? | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Trends | | | | | | Gaps in Literature | | | | |
| | | Adoption | Servitization | Digital sustainability | Enabling Platforms | Digitalization of processes | Born globals | Longitudinal studies | Emerging economies | Effects by size | Organizational culture | Digital risks |
| 1 | Analyzing the Efficiency of Digitalization in SMEs... | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 2 | Analysis of the Relationship Between IT and Indust... | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| 3 | When Digitalization Meets Omnichannel in Internati... | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 4 | The Role of Digitalization in Cross-Border E-Comme... | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 5 | The Relationship Between Technological Dynamics of... | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 6 | The Impact of Social Media and Digital Platforms E... | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 |
| 7 | The Impact of Innovation-Driven Digital Transforms... | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 8 | The Determinants of Cross-Border E-Commerce Adopti... | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| 9 | Tackling Digital Transformation Strategy: How It A... | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| 10 | Tackling Business Model Challenges in SME Internat... | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 11 | Strategic Adaptation of Enterprises in Changing Ec... | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | Spatial Patterns and Drivers of SME Digitalisation | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 |
| 13 | Main Competitive Advantages of SMEs at the ... | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| 14 | Methodology to Increase the Profitability of a Per... | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| 15 | Managing Digital Transformation During Re-internat... | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| 16 | The Internationalization of Small and Medium-Sized Industries | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 |
| 17 | Is Digital Transformation a Barrier to Export Redu... | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |
| 18 | Influence of Digital Technologies and Its Technolo... | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19 | How is Digital Transformation Changing Business Mo... | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 20 | How Commitment and Platform Adoption Drive the E-C... | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 |
| 21 | Global Market Entry for Finnish SME eCommerce Comp... | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 |
| 22 | Gender Perspectives on SME International Trade and... | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| 23 | From Strategy and Practice to Organizational Succe... | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 24 | Factors Influencing the Digitization Process of Pe... | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| 25 | Exploring the Co-Creation of SMEs and Service Prov... | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 26 | Environmental Sustainability, Digitalisation, and ... | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 |
| 27 | Entrepreneurial Orientation in the Age of Artifici... | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| 28 | Enhancing International SME Competitiveness throug... | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 29 | Effects of Industry 4.0 on Different Export Dimens... | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 30 | Do Digital Technologies Level the Playing Field fo... | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 |
| 31 | Digital Transformations Shaping SME Internationali... | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 |
| 32 | Digital Transformation in SMEs: Understanding Its ... | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| 33 | Digital Transformation as a Driver for International... | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| 34 | Digital Transformation and the 3C Business Model f... | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 1 |
| 35 | Digital Transformation and SME Internationalisatio... | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 |
| 36 | Digital Transformation and Export Performance: A P... | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 37 | Digital Servitization Strategies for SME Internati... | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 38 | Digital Platforms, Internal Digitalization, and In... | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 39 | Digital Platform Utilization and ICT Literacy on G... | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 1 |
| 40 | Dynamic Management Capabilities of Managers | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 |
| 41 | Business Model Innovation and Digitalization in SM... | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 |
| | Results | 25 | 15 | 20 | 32 | 31 | 22 | 21 | 19 | 11 | 19 | 13 |