

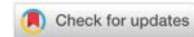
DIGITAL TRANSFORMATIONS SHAPING SME INTERNATIONALIZATION - SERBIAN CASE

Stevica Dedanski^{1*}, Boris Jevtic², Radmila Grozdanic³

¹Faculty of Social Sciences, Belgrade, Serbia, e-mail: stevica.dedjanski@fdn.edu.rs

²Computing Faculty RAF, Belgrade, Serbia, e-mail: boris.jevtic10@gmail.rs

³DigitStar Foundation, Belgrade, Serbia, e-mail: sme_rada@hotmail.com



Abstract: The challenges of achieving sustainable development for SMEs in the digital era highlight the need to address both technological and strategic aspects of growth. Recognizing this, the authors reviewed literature and policies, focusing on how firm digitalization and internationalization within Serbia's digital ecosystem can drive innovation in operations, products, and market communication to support SME internationalization. Given that SMEs constitute 99% of Serbia's enterprises, their sustainable development is crucial. To investigate this, data were gathered from 417 small and medium-sized enterprise executives online between March and June 2024, supported by the Association of Employers of Serbia. The study analyzed 18 predefined statements using a quintile rating scale and utilized correlation methods to evaluate the impact of digitalization, the digital ecosystem, and internationalization. Key findings reveal that SME digitization ($R^2 = 0.6658$) and digital ecosystem factors ($R^2 = 0.2292$) exert considerable influence on internationalization. However, the effectiveness of national regulations is constrained by issues in implementation and enforcement. These insights emphasize the importance of embedding digital technologies into SMEs' innovation policies and international strategies to enhance their competitiveness in global markets. This work enriches the academic field by drawing attention to areas for improvement, such as niche marketing, global-born strategies, and digital framework policies, which are essential for strengthening SME export performance. It also advances theoretical discussions on corporate activism, social narratives, and disruptive technologies while addressing gaps in SME internationalization strategies.

Keywords: SME Internationalization, Digitalization, Digital Ecosystem, Innovation Strategies, Serbia

Field: Social Sciences

1. INTRODUCTION

Key contributors to sustainable economic growth in various nations are small and medium-sized enterprises (SMEs). (Ahn., Khandelwal., & Wei, 2011). In recent years, they have increasingly become active players in the international market, fueled by technological progress, which has reduced the risks and expenses of entering foreign markets. (Altuzarra., Bustillo., & Rodriguez, 2016; Angelsberger, 2017). The emergence of digital technologies plays a pivotal role in these advancements. Prior studies have emphasized the intricate connections between internationalization, digitalization, and sustainability within the SME context. (Biesebroeck., Konings., & Martincus, 2016; Bilgin., Lau., & Demir, 2012). However, as noted by Bilkey & Tesar (1977), this field is rapidly evolving, but substantial gaps persist in our understanding of the impact of digitalization on SME internationalization. This study seeks to examine how digital technologies, combined with the national digital ecosystem, influence the SME internationalization process. Internationalization has been understood and defined through multiple perspectives, reflecting its complex and multifaceted nature. Worldwide engagement is often described as a gradual process in which a company broadens its involvement in global markets, establishes connections with international business partners, and conducts transactions across borders. Foundational perspectives emphasize incremental growth and the importance of relationship-building as key components of this process. These definitions are complemented by theoretical approaches that provide deeper insights into how firms internationalize. Among these approaches is the behaviorist perspective. In contrast, the resources and skills approach, rooted in Penrose's (1959) and Teece et al.'s (1997) works, underscores the importance of company-specific capabilities as drivers of business success. The relational (network) perspective emphasizes the significance of relationships and interactions. In promoting internationalization, the born global perspective examines newly established firms that create and exchange knowledge through global networks, as noted by Mercier-Suissa and Bouveret-Rivat (2010). Research on SME internationalization has also identified various factors influencing this process, exploring how information internalization, network development, and other determinants shape SME internationalization. Meyer and Skak (2002) proposed a gradual evolution toward internationalization as SMEs build networks and capabilities. Leonidou (1995) categorized export stimuli into internal drivers, such as human resources.

*Corresponding author: stevica.dedjanski@fdn.edu.rs

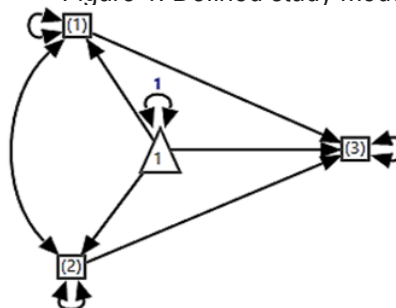


Further, the importance of data, expertise, and collaboration in internationalization decisions highlights how these factors collectively influence SMEs' ability to navigate global market. A transformative trend in SME internationalization is the rapid adoption of digitalization. Digital practices are reshaping business landscapes by enabling SMEs to enhance their competitive advantage and extend their reach through virtual channels. The integration of technology is driving the emergence of smart companies, enabling SMEs to optimize their operations and, in turn, enhancing their ability to meet the demands of an expanding market and digital consumer base with greater efficiency. These advancements are not merely tools for operational improvement but are reshaping the fundamental ways in which SMEs engage with global markets. The dynamic interplay between digitalization and internationalization raises important questions about how SMEs can harness these technologies to attract and retain digital customers while building sustainable competitive advantages. The literature suggests that strategies embracing new digital technologies and leveraging insights from digital consumption trends will be crucial for SMEs navigating an increasingly interconnected global economy. Future research should further explore how digital transformation influences SME operations, customer engagement, and market positioning, offering actionable recommendations to support their internationalization journeys. The chosen digital factors to be explored in this research are crucial because they have to provide enterprises with the tools, support, and secure environment they need to digitalize effectively and compete globally.

At first, a well-rounded national digital ecosystem that allows enterprises to transition smoothly into digital operations, address international opportunities, and expand in a highly interconnected global marketplace, Building Trust and Security in Digital Operations, Enhancing Competitiveness Through Innovation, Providing Access to Global Financial Tools, Empowering a Skilled, Ensuring Regulatory Alignment and Market Access (e-commerce, digital contracts and payments, simplified online services, cybersecurity, data protection aligned with international standards, and export promotion programs make it easier for enterprises to enter foreign markets), Supporting Data-Driven Global Strategy, Facilitating Cross-Border Partnerships, Promoting Digital Inclusion and Equality Regulatory Framework for Digital Operations and Market Entry, and SMEs digitalization, as the next defined factor to be researched in the study, importance is in supporting enterprise exports, making global operations more efficient, accessible, and responsive to international market demands (Jevtić et al., 2013; Miškić et al., 2024). Cloud technology enables SMEs to store and manage data remotely. Digital tools for customer engagement, such as social media, chatbots, and email marketing, allow SMEs to interact with customers efficiently and personalize communication. Digitalization provides SMEs with access to data analytics tools, helping them make informed decisions based on customer insights and market trends. Adopting e-commerce platforms and other digital sales channels opens new markets and revenue streams for SMEs, helping them reach customers beyond their local area and even internationally. Automation of repetitive tasks reduces errors and increases operational efficiency, allowing SMEs to focus resources on growth and innovation. With increased digitalization, cybersecurity measures have become vital for securing sensitive data and upholding customer confidence. SMEs need to adopt secure practices to safeguard against cyber threats studied in Špiler et al.'s (2023), Srebro et al.'s (2023), and Jevtić et al.'s (2024) works. Many SMEs cater to mobile-centric customers, making mobile-friendly security measures, financial technology (Fintech) solutions and more flexible SME operations are factors characterizing the digital transformation of SMEs, offering them greater operational efficiency, new market opportunities, and the agility needed to thrive in a digital-first world (Jevtić, Vučeković & Tasić, 2024).

The following literature and selected factors of influence on SMEs internationalization are defined by further research model (Figure 1). The model consists of 2 independent variables: SME digitization (1), national digital ecosystem (2), and dependent internationalization of SMEs (3).

Figure 1. Defined study model



Source: Authors' research

2. METHODOLOGY

Based on existing theoretical sources, relevant literature, and the author's previous studies on digitalization, SME development, entrepreneurship, and innovation, an empirical investigation was conducted to explore the views of 417 SME representatives in Serbia. The study focused on two main factors: the national digital ecosystem and the digitalization of SMEs, and how they influence SME internationalization. The study was conducted using an online questionnaire from March to June 2024, across the entire country, with support from the Association of Employers of Serbia. Respondents provided their views on the significance of the research variables for the dependent variable using a quintile rating scale (1–5, with 5 being the highest rating) across 18 predefined statements. To assess the influence of these variables, regression analysis was used, as presented in Table 1. The average measurements of the SMEs' internationalization (3) as a dependent variable were analyzed with respect to the SMEs' digitization (1) and digital ecosystem (2) - different independent variables, using Analysis of Variance (ANOVA). The research hypotheses are defined as follows:

H0: A prominent association is not evident among SMEs' digitization (1), digital ecosystem (2), and SMEs' internationalization (3).

Ha: A prominent association can be seen among SMEs' digitization (1), digital ecosystem (2), and SMEs' internationalization (3).

3. RESULTS

Table 1 presents an analysis that identifies the statements for all variables in the model, highlighting those evaluated most positively and those with the greatest consistency or disagreement among respondents. The highest average scores were for statements "2.1" (4.8369) and "2.2" (4.7649), indicating that respondents rated these items most positively. In contrast, the lowest average scores were for statements "3.1" (3.9544) and "2.6" (4.0839), suggesting a lower level of agreement or less positive responses. The smallest standard deviation was for the statement "2.1" (0.3699), indicating strong agreement among respondents. The highest standard deviation was for the statement "3.6" (0.8219), showing greater variability in responses for that statement.

Table 1. Mean and variability measures for the statements

Claim		
	Mean	Std Dev
Claims for SMEs' Digitization		
1.1 Digitalization of internal and external business functions streamlines and optimizes processes, which is crucial for SMEs engaged in exporting	4.4988009592	0.5680800164
1.2 Automation tools streamline the creation and management of export documentation and compliance, reducing human error and enhancing efficiency in customs procedures.	4.1055155875	0.5951674662
1.3 Cloud platforms enable centralized, remote access to information, helping manage export operations and coordinate with global partners from anywhere.	4.3932853717	0.6677696787
1.4 Real-time tracking and automated inventory systems improve stock management, reducing delays and ensuring timely fulfillment of international orders	4.6858513189	0.6314028238
1.5 Integrated digital supply chain solutions facilitate efficient shipping and tracking, allowing SMEs to monitor shipments and address logistical issues proactively.	4.4844124700	0.5192188128
1.6 Digital financial tools with multi-currency and international transaction capabilities simplify invoicing, payments, and currency conversions for exporters	4.1846522782	0.4970629472
Claims for Significance of Digital Ecosystem		
	Mean	Std Dev
2.1 A strong digital infrastructure, including high-speed internet, 5G, and reliable cloud services, allows businesses to seamlessly interact with international markets and customers.	4.8369304556	0.3698728699
2.2 Simplified eCommerce processes and streamlined cross-border logistics empower enterprises to access international customers with ease and efficiency	4.7649880096	0.4465918615
2.3 Adopting international cybersecurity standards ensures data protection and builds confidence among global customers and partners	4.4436450839	0.5346765276
2.4 Availability of cross-border financial services and payment solutions allows enterprises to efficiently manage international transactions and investments	4.4628297362	0.5496368139
2.5 Government export initiatives provide essential resources and guidance for enterprises, making it easier to enter and succeed in foreign markets	4.4700239808	0.5672879555
2.6 Digital platforms that foster international collaboration provide enterprises with opportunities for partnerships, joint ventures, and market expansion	4.0839328337	0.657907431
Claims for SMEs' Internationalization		
	Mean	Std Dev
3.1 Online resources, social media insights, and specialized market research platforms help SMEs identify high-potential regions, understand customer preferences, and evaluate competitors.	3.9544364508	0.5373865993
3.2 Access to global market intelligence and data enables enterprises to make informed decisions and tailor strategies to international consumer demands	4.1678657074	0.5552403336
3.3 SMEs then develop a digital strategy that includes selecting appropriate online sales channels, global e-commerce marketplaces or localized e-commerce sites	4.3477218225	0.5687797662
3.4 With insights from data analytics, SMEs can adjust marketing strategies, pricing, and even product features to improve alignment with market demands and maximize growth potential.	4.4052757794	0.5059938651
3.5 Digital tools like chatbots, multilingual support, and CRM (Customer Relationship Management) platforms enable SMEs to provide responsive customer service across time zones.	4.6330935252	0.6333353965
3.6 Localization is critical for engaging international audiences, where SMEs adapt their products, website, and marketing materials to fit the cultural, linguistic, and regulatory requirements of each target market	4.2541966427	0.8219570278

Source: Authors' research

Pearson correlation coefficients for all three variables (1), (2), and (3) demonstrate the positive relationships between each pair, with relatively high correlation coefficients. This suggests a significant interdependence among the variables, which can be explored further in analyzing their relationships. Specifically, the correlation between (1) and (2) is 0.7126, suggesting a significant positive relationship, where variable (1) explains 50.77% of the variance in variable (2). Similarly, the correlation between variables (1) and (3) is 0.8293, meaning that variable (1) accounts for 68.77% of the variance in variable (3), also reflecting a strong positive relationship. The correlation between variables (2) and (3) is 0.7038, suggesting a similarly strong connection, with variable (2) explaining 49.53% of the variance in variable (3). To assess the significance of these relationships, reveal that the theoretical model significantly explains the variation observed in the data. This affirms the statistical relevance of the model and justifies the acceptance of the hypothesis (Ha). - A prominent association can be seen between SMEs' digitization (1), digital ecosystem (2), and SMEs' internationalization (3). Further, the regression analysis presented in Table 3 reveals that the independent variables (1) and (2) exhibit a strong influence on the dependent variable (3). This reveals that adjustments in variables (1) and (2) can markedly affect the result of the variable (3). Significantly, all independent variables have p-values under 0.05, highlighting their strong statistical relevance. Among them, variable (1) exerts a stronger influence on the outcome variable, as evidenced by the higher standardized beta coefficient (0.665881 vs. 0.229279).

Table 2. Estimated Parameters

Term	Estimate	Std Error	t Ratio	Prob> t	Std Beta	VIF
Intercept	-0.799159	0.202279	-3.95	<0.0001	0	.
(1)	0.7602055	0.042802	17.76	<0.0001	0.665881	2.0314508
(2)	0.3888877	0.063591	6.12	<0.0001	0.229279	2.0314508

Source: Authors

A linear regression equation was derived from the data presented in (Table 2), shown in (Formula 1):

$$(3) = -0,799159 + 0,7602055 \cdot (1) + 0,3888877 \cdot (2) \quad (1)$$

Figure 2, providing the non-standardized contribution, and Figure 3, providing the standardized contribution to the research model, are included as attachments in the study.

CONCLUSION

This research focused on analyzing the impact of digitalization and the digital ecosystem on the internationalization journey, with Serbian SMEs serving as the primary case study.

The findings highlight the need for SMEs to prioritize these factors to enhance their competitiveness in the global market. Additionally, national policies and regulations should enhance the digitalization framework and support further technological and knowledge integration within SMEs. In this context, the government plays an instrumental role in facilitating SME entry into global markets through supportive trade policies, regulations, and incentives. Since internationalization is fundamentally a capability-building process, it requires SMEs to actively gather information, establish networks, and cultivate innovative and sustainable competencies to remain competitive on the international stage.

This study's outcomes aim to advance the academic discourse surrounding SMEs by highlighting their growth through internationalization and the innovative digital ecosystem within the digital economy in Serbia. Additionally, the findings can inform management practices, particularly efforts to strengthen the digital ecosystem for SMEs through dynamic capabilities, including readiness for change and agile leadership.

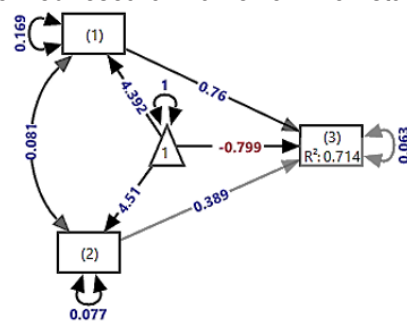
However, the study has limitations, particularly in establishing causal relationships as outlined in the hypothesis. The results could be more aligned with theoretical reasoning if the research had focused on specific technology sectors, services, or manufacturing industries rather than SMEs from all industrial sectors.

Future research could adopt a more focused approach to fully explore each process involved in realizing a digital ecosystem and implementing digital technologies within SMEs. Key areas for exploration could include cloud technology, digital customer engagement, digital sales channels, automated

business processes, remote work and collaboration tools, cybersecurity and data protection, mobile-first approaches, financial technology (fintech) solutions, and scalability and flexibility.

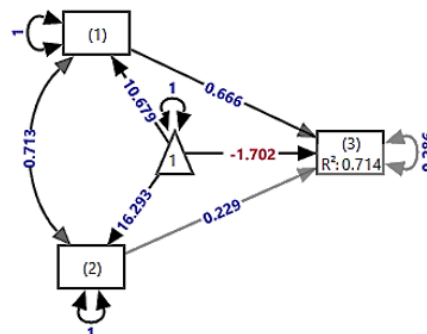
ADDITIONAL DATA

Figure 2. The Defined research framework Non-standard contribution sizes



Source: Authors' research

Figure 3. The Defined research framework Standard contribution sizes



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