Economic Impact of Implementing Mobile Applications in the Business Models of Small and Medium-Sized Enterprises

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Abstract. This article aims to examine the role of mobile applications in the activities of small and medium-sized enterprises of Ukraine with an emphasis on their impact on the efficiency of business processes, competitiveness and adaptability to the challenges of the digital economy. The methodological basis of the study included general scientific methods of analysis and synthesis, a systematic approach, as well as a comparative analysis of practices for implementing mobile technologies in the activities of enterprises. The article analyzes the current use of mobile applications in the Ukrainian business environment and identifies their key advantages, including increased productivity, optimization of communications and reduced transaction costs. At the same time, the study identified the main risks hindering the integration of digital solutions were identified, financial, personnel and infrastructure limitations. Based on business process analysis, the economic impact of mobile applications is reflected in reduced management time, greater planning accuracy, and improved customer interaction. The practical significance of the study lies in developing a set of recommendations for the optimal use of mobile applications.

Keywords: digitalization of business, business processes, competitiveness, digital transformation.

Економічний ефект впровадження мобільних застосунків у бізнес-моделях малих та середніх підприємств

Анотація. Метою статті є дослідження ролі мобільних застосунків у діяльності малих та середніх підприємств України з акцентом на їхній вплив на ефективність бізнес-процесів, конкурентоспроможність та адаптивність до викликів цифрової економіки. У роботі розглянуто питання використання мобільних технологій як інструменту модернізації управління, що дозволяє підприємствам швидше реагувати на зміни ринкового середовища та зростаючі потреби споживачів. Методологічною основою дослідження стали загальнонаукові методи аналізу й синтезу, системний підхід, а також порівняльний аналіз практик інтеграції мобільних застосунків у бізнес-моделі компаній різних галузей. У статті було проаналізовано сучасний стан цифровізації бізнес-середовища України та визначено рівень поширення мобільних застосунків серед підприємців. Окреслено ключові переваги їхнього використання: підвищення продуктивності праці, автоматизація рутинних операцій, оптимізація внутрішніх і зовнішніх комунікацій, зниження транзакційних витрат та формування більшої клієнтоорієнтованості. Разом із тим виявлено й основні бар'єри, які стримують активне впровадження цифрових рішень: обмежені фінансові ресурси малих підприємств, нестача кваліфікованих кадрів, недостатній рівень цифрової інфраструктури, а також побоювання щодо кібербезпеки. На основі аналізу бізнес-

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процесів оцінено економічний ефект від застосування мобільних технологій, який проявляється у скороченні витрат часу на управлінські операції, підвищенні точності планування, зменшенні кількості помилок у взаємодії з клієнтами та зростанні рівня їхньої задоволеності. Практична значимість дослідження полягає у формуванні комплексу рекомендацій для керівників та власників підприємств щодо оптимізації використання мобільних застосунків з метою підвищення стійкості та інноваційності бізнесу в умовах цифрової трансформації економіки.

Ключові слова: цифровізація бізнесу, бізнес-процеси, конкурентоспроможність, цифрова трансформація.

Introduction

Modern small and medium-sized enterprises (SMEs) are rapidly transforming under the influence of digitalization. Digital tools, particularly mobile applications, increasingly serve not only as auxiliary resources but also as strategic elements of business models. They enable the automation of operational processes, the optimization of resource management, and the enhancement of communication efficiency with customers and partners. Mobile solutions open new sales channels and create conditions for service personalization, which is especially important for SMEs in a competitive environment. Despite their obvious advantages, many enterprises have either not integrated mobile applications at all or use them only sporadically, without a clear strategy or systematic approach. This is driven by both limited digital competence and uncertainty about the specific economic benefits of such tools. The main problem lies in the lack of a comprehensive analysis of the economic impact of integrating mobile applications into the business models of SMEs. This creates a barrier to the large-scale use of innovative technologies, which in turn limits the growth and development potential of small and medium-sized enterprises. There is an urgent need for systematic research to assess the impact of mobile applications on key performance indicators of SMEs. Such research would not only fill existing academic gaps but also provide practical recommendations for businesses regarding the selection, implementation, and optimal use of mobile solutions.

The use of mobile applications in small enterprises demonstrates significant potential for improving operational efficiency and profitability. The study by Ramírez J. [1] showed that the application of mobile technologies allows for the optimization of management processes by reducing time and resource costs, while also accelerating decision-making. At the same time, the economic effect depends on the quality of integration and the adaptation of business models to digital solutions, which creates a gap for further empirical research. Another important trend is the clear link between the adoption of mobile business applications and productivity growth in SMEs. Latifah N. et al. [2] established that technological readiness and organizational support determine the level of economic benefits obtained, whereas insufficient digital competence of personnel reduces actual financial benefits. These findings highlight the need for a comprehensive approach to the implementation of mobile solutions, which consider both technological and economic aspects.

Mobile applications also stimulate innovative management strategies and support business scaling. Kholid M. et al. [3] showed that digital tools enable enterprises to significantly increase sales volumes and expand sales markets without a proportional increase in costs. However, specific economic indicators – such as profitability and reduced operating expenses – still require quantitative assessment, creating new avenues for research. An equally important aspect is strategic human resource management in the process of digital transformation. The study by Gadzali S. S. et al. [4] demonstrated that effective adaptation of employees to digital technologies increases productivity and reduces costs associated with retraining and errors. At the same time, the lack of an assessment of the financial effect of

such changes leaves a gap for further research on the economic impact of mobile solutions in SMEs.

From the perspective of sustainable development, mobile applications play a key role in enhancing the efficiency and innovative activity of enterprises. Iakovets A. et al. [5] found that the active use of mobile technologies contributes to the optimization of management processes and adaptation to the conditions of Industry 4.0. However, the economic indicators of this growth remain partially undefined, requiring additional empirical confirmation.

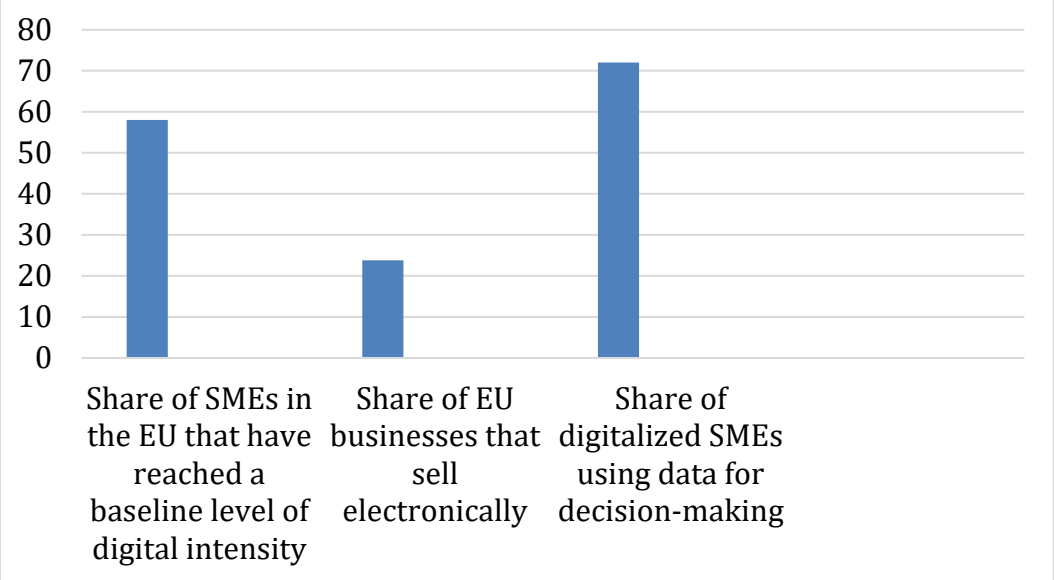
Finally, it is important to highlight the significance of SMEs for the economic development of countries. Pedraza J. M. [6] emphasized that these enterprises provide substantial employment and contribute to GDP, yet the impact of digitalization and mobile applications on their economic performance has not been sufficiently studied. This highlights an urgent need for structured research into the specific economic impact of integrating mobile technologies into the business models of SMEs.

The purpose of this article is to examine the economic impact of implementing mobile applications in the business models of small and medium-sized enterprises and to substantiate their role in enhancing efficiency, competitiveness, and financial resilience.

To achieve this aim, the following objectives are defined: to analyze the current state of mobile application use in the activities of SMEs; to identify the main advantages and risks of integrating mobile solutions into the business models of SMEs; to assess the economic impact of implementing mobile applications using key business processes as examples; and to propose practical recommendations for the optimal use of mobile applications in enterprise operations.

Results

The current level of digitalization of SMEs is characterized by unevenness both between countries and within national economies, by industry and by firm size. In OECD and EU member states, more than 60% of enterprises have reached a basic level of digital intensity. However, another share of SMEs remains at a low or very low level of digitalization, reflecting limited resources and competencies for implementing comprehensive digital solutions. This disparity is crucial for assessing the potential of mobile applications in business models, since basic digital infrastructure and skills are prerequisites for the effective integration of mobile services [7].



Source: compiled by the author based on [8; 9]

Fig. 1. Key indicators of global digitalization

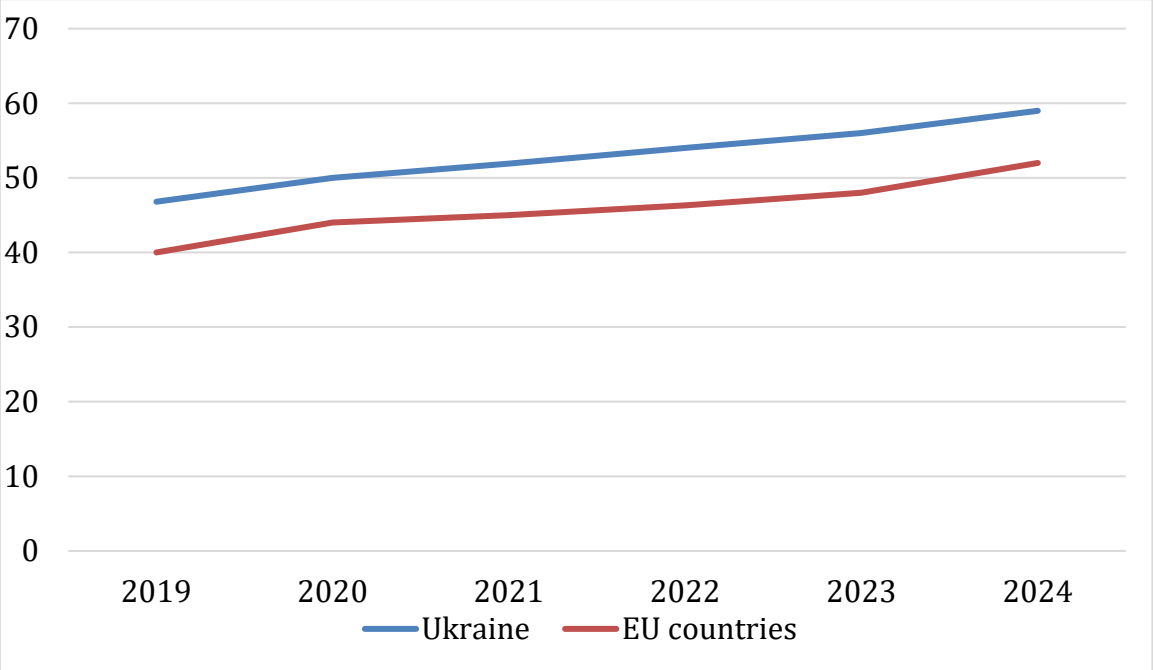
The most intensive penetration of mobile solutions is observed in retail and e-commerce. Small and medium-sized retailers use mobile applications to organize sales (mobile stores), manage customer loyalty programs, control inventories in real time, and provide an omnichannel shopping experience. The growth of mobile commerce (m-commerce) is confirmed both by global market estimates and by consumer behavior studies, which demonstrate a high share of transactions made via smartphones and a significant increase in the time users spend on shopping applications. This makes mobile applications a strategic tool for small retailers seeking to expand their sales markets and increase sales conversion [10].

The service sector (hospitality, restaurant business, private medical practices, beauty salons, courier and logistics services) is also actively adopting mobile solutions. In the hospitality and HoReCa industries, mobile applications are used for booking, order processing, and contactless payment systems; in courier and logistics services, they are used for order tracking, route optimization, and real-time communication with customers. For small service businesses, mobile tools often serve as a cost-effective and rapid alternative to complex ERP systems, allowing them to significantly improve operational efficiency without large capital investments. Most often, it is SMEs that first implement simple mobile solutions, which enable them to quickly achieve returns on investment. The financial sector, particularly financial technologies, demonstrates widespread use of mobile applications among SMEs, both for accepting payments and for managing cash flows. Small businesses actively use mobile POS solutions, digital wallets, and mobile banking applications to conduct transactions and control cash operations. The integration of mobile payment modules into business processes makes financial operations faster and more transparent, which increases the attractiveness of SMEs for customers and simplifies accounting. The growth of mobile financial services also stimulates the adoption of mobile solutions in related sectors, particularly in trade and services [11].

Other sectors with significant potential for mobile integration include healthcare, agribusiness, and professional services. In medicine, mobile applications are used for patient registration, telemedicine, and monitoring, which is particularly relevant for private clinics and individual practices. Small agricultural enterprises use mobile tools for agronomic analytics, supply chain management, and logistics tracking. Professional services (consulting, legal, and accounting firms) benefit from mobile access to client databases, calendars, and documents, which enhances the efficiency of customer service. For these sectors, mobile solutions often serve as a catalyst for broader digital transformation.

The examined examples of sectoral integration of mobile applications align with the overall dynamics of mobile commerce development worldwide and in the European Union and Ukraine. The presented data (Fig. 2) demonstrates a steady increase in the share of m-commerce within the structure of e-commerce. While in 2019 mobile purchases accounted for less than half of the total volume of online orders, by 2024 this figure had grown on average to over 55% globally.

In the EU countries, the trend is characterized by a gradual increase in mobile share; however, the dynamics are somewhat more restrained compared to global indicators. This is explained by a more established market structure, where a significant share of e-commerce is still carried out through desktop solutions. Nevertheless, even in developed European countries, a clear shift in consumer preferences toward mobile channels can be observed, which indicates their strategic importance for the further development of SME business models.



Source: compiled by the author based on [12; 13]

Fig. 2. Dynamics of the share of mobile commerce (m-commerce) in the total volume of e-commerce in EU countries and Ukraine, 2019–2024

In Ukraine, the dynamics are even more pronounced: the share of m-commerce between 2019-2024 grew at a faster pace than on average in the EU. This phenomenon can be explained by the high level of mobile internet penetration, the active use of smartphones as the main tool for online shopping, and the rapid adaptation of the population to mobile payment systems. For small and medium-sized businesses, this creates favorable conditions for attracting customers and increasing sales volumes through mobile platforms, even with relatively lower investments in traditional IT solutions.

The positive dynamics of m-commerce development in Ukraine and the European Union are also confirmed by specific examples of SME activity. While statistical data demonstrate the general trend, case analysis makes it possible to identify the real mechanisms of the economic impact of mobile application integration. Practice shows that mobile solutions are able not only to stimulate sales growth but also to optimize costs, improve customer experience, and provide new channels for market interaction. For this reason, it is appropriate to turn to examples of successful practices in Ukraine and EU countries, where mobile tools have become a key factor in increasing the efficiency of SME business models.

Table 1

Economic impact of implementing mobile applications in SME practice (before and after integration)

Country	Sector of activity	Indicators before implementation	Indicators after implementation
Ukraine	Retail trade (EVA, mobile application of the chain)	Online sales through mobile channels accounted for less than 15% of the total volume	The share of mobile purchases exceeded 45%, with online orders tripling
Ukraine	FoodTech (Glovo, Rocket)	Logistics costs and order processing time remained high	Delivery costs decreased by 20–25%, and the number of orders increased by 40%
Poland	HoReCa (small	Orders were placed mainly	Online orders through

(EU)	restaurants with mobile ordering applications)	offline (≈80%)	applications grew to 35–40%, and the average check increased by 15%
Germany (EU)	Small fashion brands (mobile marketplaces Zalando, AboutYou)	Low reach of the young audience (up to 20%)	Thanks to mobile channels, reach increased to 50%, and sales through applications accounted for more than 30% of the total

Source: compiled by the author based on [13; 14]

The presented data indicates a tangible economic impact of mobile integrations. Ukrainian examples illustrate both large retail chains and local service providers that, thanks to mobile applications, were able to increase the share of online sales and reduce logistics costs. In EU countries, the key outcome was not only the optimization of processes but also the formation of a new segment of consumers oriented toward mobile communication and purchasing formats. This confirms that the implementation of mobile solutions is a universal tool for SME development, regardless of the field of activity or the level of market maturity. Despite the presence of positive examples of integrating mobile applications into the activities of small and medium-sized enterprises, digital transformation of SMEs in Ukraine occurs unevenly. A significant share of businesses express interest in adopting mobile solutions but face several structural, financial, and organizational barriers. Recognizing these limitations is essential for shaping realistic digitalization strategies and for developing state and corporate support programs.

An important aspect of the study is the identification of key barriers that hinder the digitalization of small and medium-sized businesses in Ukraine. One of the most significant obstacles is limited access to financial resources. According to the Finance Access Survey [15], 46% of SME representatives assess access to financing as “difficult,” while another 12% consider it “completely unattainable.” The main reasons cited include high interest rates (62%), collateral requirements (45%), and complex bureaucratic procedures (36%) [15]. The lack of affordable credit and specialized financial instruments makes investments in developing proprietary mobile applications or integrating ready-made technological solutions virtually unattainable for most small entrepreneurs.

A second substantial barrier is the insufficient level of digital competencies among entrepreneurs and their employees. According to a study by the European Business Association [16], 41% of respondents rate the level of digital literacy of their company’s staff as average, while 13% assess it as low [16]. This means that a significant share of SMEs do not possess the necessary knowledge and skills for the effective implementation of modern digital solutions. In the context of rapid technological development, the shortage of qualified personnel becomes a constraining factor that reduces the potential for business digital transformation.

An equally significant barrier is the limited trust of entrepreneurs and consumers in digital technologies. A survey conducted among Ukrainian companies on their readiness for crisis situations revealed that 62% of organizations lack a developed strategy for responding to cyber threats [17]. The low level of data protection and the absence of systematic cybersecurity measures contribute to widespread skepticism both among businesses and consumers, who fear risks of personal data leakage and fraudulent activities.

Another major constraint is the uneven development of digital infrastructure across regions. Although recent years have seen a significant expansion of mobile internet coverage, in remote areas the quality of connectivity remains insufficient for the active use of digital services. In addition, delays in the development of modern payment instruments and the uneven integration of fintech solutions complicate the activities of entrepreneurs in rural and

small urban communities [17]. This results in a “digital divide” between enterprises in large urban centers and those in regional areas.

Finally, but no less importantly, regulatory uncertainty continues to hinder digitalization. According to OECD assessments [18], Ukraine’s system of regulatory support for SMEs in the field of digitalization remains underdeveloped compared to European practices. Entrepreneurs note excessive regulation, the absence of tax incentives, and the lack of clear rules regarding digital business processes [18]. As a result, even companies ready for digital innovations are unable to realize their potential due to the instability of the regulatory framework.

Summarizing the above, it can be argued that the digitalization of SMEs in Ukraine is hindered by a complex set of factors, ranging from financial and personnel constraints to institutional uncertainty and unequal infrastructure development. Overcoming these challenges requires systemic solutions that encompass financial instruments, educational programs to enhance digital literacy, infrastructure development, and the improvement of the regulatory environment.

First, it is necessary to develop flexible financial mechanisms to support digitalization. For entrepreneurs, state grants for digital innovation, preferential loan programs for the development or integration of mobile applications, and partnership programs with fintech companies will be particularly important. The attraction of venture capital and the development of crowdfunding platforms can serve as alternative instruments for financing digital projects.

Second, investment in improving the digital competencies of personnel is essential. Conducting training sessions, educational courses, and acceleration programs will help create a critical mass of specialists capable of effectively using mobile solutions. State institutions and business associations can act as coordinators in establishing SME-oriented educational platforms with a practical focus on real business processes.

Third, it is necessary to build trust in digital technologies. This involves the implementation of cybersecurity standards, the development of certification systems for digital services, and an active information policy that promotes the safe use of mobile applications. State support in the field of cybersecurity, particularly for small enterprises, will help minimize the risks of data breaches and increase the readiness of both businesses and consumers for digital interaction.

Fourth, the development of digital infrastructure should be strengthened. Expanding high-speed mobile internet coverage, integrating modern payment instruments, and supporting local IT providers will create a favorable environment for the operation of mobile services. This is particularly important for regions where the digital divide is most pronounced.

Finally, it is advisable to improve the regulatory environment. Tax incentives for innovation, simplification of procedures for registering digital business processes, and the alignment of Ukrainian legislation with European practices will contribute to reducing regulatory risks and accelerating the integration of mobile technologies into enterprise business models.

Thus, the implementation of these recommendations will not only overcome the existing barriers to digitalization but also ensure the sustainable development of mobile technologies in SME practice. This will enhance their competitiveness, increase productivity, and facilitate their integration into the global digital market.

Conclusions

The study confirmed that mobile applications are becoming an important tool for the digital transformation of small and medium-sized enterprises (SMEs). The analysis of their current use revealed uneven penetration of mobile technologies across different sectors of

SME activity. The most active implementation is observed in retail, e-commerce, food services, and logistics, while healthcare, agribusiness, and professional services remain at an early stage of adoption. This confirms the trend of gradually diversifying mobile solutions to achieve broader sectoral coverage.

The main advantages of integrating mobile applications were identified, including increased efficiency of business processes, cost optimization, improved communication with customers, and the creation of new sales channels. The study revealed several risks, including limited digital skills, cybersecurity threats, uneven infrastructure development, and regulatory constraints. These factors create additional challenges for entrepreneurs and require systemic solutions.

The assessment of the financial outcomes of implementing mobile applications, based on practices in Ukraine and EU countries, confirmed significant growth in sales volumes, increased labor productivity, and reduced costs following the integration of digital tools. Comparative analysis before and after the introduction of mobile solutions shows that even relatively modest investments in digitalization yield substantial improvements in financial performance and competitive advantage.

The study proposes practical recommendations for the optimal use of mobile applications in SMEs. These include the introduction of flexible financial instruments to support digitalization, the enhancement of staff digital competencies, strengthening of cybersecurity, development of infrastructure, and improvement of the regulatory environment.

Thus, the results of the study allow us to conclude that the implementation of mobile applications in small and medium-sized enterprises not only contributes to the optimization of business models but also serves as an important factor in their competitiveness within the global digital economy. The proposed practical recommendations may serve as a guideline for the further digital transformation of SMEs in Ukraine and their integration into the European economic space. A promising direction is a comparative analysis of the experience of EU countries and Ukraine in the field of m-commerce, particularly regarding institutional support for small business digitalization and the creation of a favorable regulatory environment. This will make it possible to develop more effective state policy mechanisms to stimulate digital innovation.

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