

УДК 330.341.1:338.24

DOI: <https://doi.org/10.30838/EP.197.281-286>**Samorodov Borys**

Dr. of Economic Sc.

Kharkiv National University named after V. N. Karazin

**Самородов Б.В.**

доктор економічних наук

Харківський національний університет імені В.Н. Каразіна

<https://orcid.org/0000-0002-5267-1178>**Kotkovskiy Volodymyr**

Dr. of Public Administration Sc.

Kharkiv National University named after V. N. Karazin

**Котковський В.Р.**

доктор наук з державного управління

Харківський національний університет імені В.Н. Каразіна

<https://orcid.org/0009-0005-8259-1936>

## IMPACT OF INNOVATIVE TECHNOLOGIES ON THE DEVELOPMENT OF SMALL AND MEDIUM-SIZED BUSINESSES IN THE DIGITAL ECONOMY

*The digital economy creates significant opportunities for the development of small and medium-sized enterprises (SMEs) by facilitating process automation, cost optimization, expanding markets, and improving customer experience. At the same time, digitalization requires significant financial resources, a high level of digital competencies of staff, and the ability to quickly adapt to technological changes, which are serious challenges for business. The article conducts a SWOT analysis to identify the key advantages, disadvantages, threats and opportunities of digitalization for SMEs.*

*The main ways of adapting enterprises to digital changes, including the development of digital skills of employees, the introduction of modern platforms and technologies, as well as cooperation with other participants in the digital ecosystem, are investigated. Considerable attention is paid to optimizing management, improving the efficiency of business processes, and developing the innovative potential of enterprises. The results of the study show that digital transformation is a key factor in increasing the competitiveness and long-term sustainability of businesses in the digital economy.*

**Keywords:** digital economy, digital technologies, innovative business development, small and medium-sized enterprises, strategic development.

**JEL classification:** L26, O32, O33.

## ВПЛИВ ІННОВАЦІЙНИХ ТЕХНОЛОГІЙ НА РОЗВИТОК МАЛОГО ТА СЕРЕДЬОГО БІЗНЕСУ В УМОВАХ ЦИФРОВОЇ ЕКОНОМІКИ

*Цифрова економіка створює значні можливості для розвитку малих і середніх підприємств (МСП), сприяючи їхній адаптації до сучасних викликів ринку. Впровадження цифрових технологій забезпечує автоматизацію процесів, оптимізацію витрат, розширення ринків збуту та покращення клієнтського досвіду. У той же час цифрова трансформація потребує суттєвих фінансових ресурсів, високого рівня цифрових компетенцій персоналу та адаптації до швидких технологічних змін, що є серйозними викликами для підприємств. У статті проведено аналіз ключових переваг та недоліків цифровізації для МСП, визначено зовнішні загрози та можливості, які формує цифрове середовище, за допомогою методу SWOT-аналізу.*

*Досліджено основні напрямки адаптації підприємств до цифрових змін, включаючи розвиток цифрових навичок працівників, використання цифрових платформ, інвестиції у новітні технології та налагодження співпраці з партнерами у цифровій екосистемі. Значну увагу приділено питанням оптимізації бізнес-процесів, підвищенню ефективності управління та інноваційного потенціалу підприємств. Окремо розглянуто роль державної підтримки у забезпеченні стійкості бізнесу, зокрема через впровадження сприятливих умов для розвитку цифрової економіки та надання інформаційних і фінансових ресурсів.*

*Результати дослідження показують, що цифрова трансформація є не лише ключовим фактором зростання конкурентоспроможності, але й важливим інструментом для забезпечення довгострокового розвитку підприємств. Запропоновані рекомендації спрямовані на мінімізацію ризиків цифровізації та максимізацію її*

переваг, що дозволить підприємствам зміцнити свої позиції на ринку та забезпечити стійкість у динамічному цифровому середовищі.

**Ключові слова:** цифрова економіка, цифрові технології, інноваційний розвиток бізнесу, малі та середні підприємства, стратегічний розвиток.

**Formulation of the problem.** In today's digital economy, innovative technologies have become a crucial factor for the development of small and medium-sized businesses (SMEs). Digital transformation creates new opportunities to optimize business processes, increase the efficiency and competitiveness of enterprises, and create new products and services that meet the needs of modern consumers. As an important component of any country's economy, small and medium-sized enterprises have a significant potential to adapt to changes in the economic environment through the use of innovative technologies.

At the same time, digital transformation requires SMEs to invest heavily in new technologies, which can be a challenge for many businesses that do not have the resources to make such changes. However, those businesses that have been able to effectively implement digital solutions have seen significant benefits, including increased productivity, improved customer experience, and expanded markets.

In this context, there is a need for a comprehensive analysis of the impact of innovative technologies on SME development, including their ability to adapt to digital change, as well as the role these technologies play in supporting and stimulating innovation.

**Analysis of recent research and publications.** Recent research confirms that digital transformation plays a vital role in SME development, boosting competitiveness, productivity, and sustainability. Bayraktar and Algan (2019) highlight SMEs' significant contribution to global job creation and economic growth, noting that digitalization drives efficiency improvements [1]. However, the State Statistics Service of Ukraine reports a decline in innovatively active enterprises, indicating challenges SMEs face in digital transformation [2].

Bradas Hoynik and Hudzek (2023) emphasize the need for adaptability, innovation, and public policy alignment for successful digital technology integration by SMEs [3]. Hall and Rama (2024) stress that investments in digital technologies during the COVID-19 pandemic enabled many SMEs in hard-hit regions to survive [4]. Restrepo-Morales et al. (2024) propose a fuzzy logic approach to overcoming digitalization barriers, offering strategies for implementing technologies to achieve business goals [5].

Romero and Mammadov (2024) identify key factors like technological infrastructure and managerial readiness as determinants of digital transformation, advocating an integrated approach to studying this process [6]. Government initiatives, such as the Cabinet of Ministers' Strategy for Digital Transformation (2020) and the Law on Stimulating the Digital Economy (2021), provide essential support through incentives and favorable conditions for IT and

innovative enterprises [7, 8].

Despite the broad recognition of the importance of digital transformation, unresolved issues persist. Among them are the decline in innovatively active enterprises, limited financial and human resources of SMEs, and the need for a more comprehensive understanding of how government support and internal business adaptability can interact to enhance digital transformation. These aspects remain insufficiently studied, particularly in the context of SMEs operating in economies with significant structural and economic challenges, such as Ukraine.

Thus, the analysis of recent studies shows that digital transformation is a key factor for SME development. However, to fully realize the potential of digitalization, further research is needed to identify effective mechanisms for overcoming existing barriers, such as limited resources, gaps in digital competencies, and inadequate integration of government support measures. This sets the foundation for the purpose of the article, which is to identify the key factors influencing SME success in the digital economy and to develop strategies for addressing the main challenges of digital transformation.

**The purpose of the article** is to identify the key factors that influence the success of small and medium-sized enterprises (SMEs) in the digital economy, as well as to develop strategies and recommendations for overcoming the main challenges associated with digital transformation.

**The main material.** Innovative enterprises are those that develop and sell innovative products or services that account for more than 70% of their turnover. This ability to adapt and implement new solutions is becoming a key factor in remaining competitive in the digital environment.

Innovatively oriented small and medium-sized enterprises (SMEs) play an important role in the development of the digital economy, contributing to productivity, job creation, and support for local economies. Table 1 illustrates the mechanisms of influence of such enterprises at the macroeconomic level, demonstrating their ability to adapt to digital changes and support sustainable economic development.

Studies show that small enterprises face significant difficulties in developing innovation activities, as evidenced by the decline in the share of innovatively active enterprises from 24.2% to 5.8% [2]. This figure is alarming, as innovation is one of the main factors that determine the success of small and medium-sized enterprises. Not only do SMEs contribute to economic growth and job creation, but they are also essential for social stability. However, in order to realize this potential, enterprises need support from the government and other external factors.

Table 1

**The impact of innovatively active SMEs at the macroeconomic level**

Key factors	Mechanisms of influence	Results at the macroeconomic level
Creation of new jobs	Increased demand for highly skilled labor as a result of innovations.	Reduced unemployment, increased employment, and improved welfare.
Developing new markets and niches	Entering new markets through innovative products and services, developing business in the online environment.	Stimulating competition, increasing export potential, and improving the country's balance of payments.
Increasing productivity	Using digital technologies to automate and optimize processes.	GDP growth, more efficient use of resources.
Development of local economies	Investing in local innovative projects, supporting partnerships with local businesses.	Strengthening the regional economy, increasing the income of communities and local businesses.
Increasing competitiveness	Use of advanced technologies to create unique products.	Increasing the level of innovation in the economy, improving the country's position in global competitiveness rankings.
Support for sustainable development	Implementation of environmental innovations, transition to green technologies, and reduction of carbon footprint.	Reducing the environmental burden and achieving sustainable development goals.
Creating an innovative ecosystem	Creation of clusters, technology parks, participation in open innovation and joint research projects.	Increasing the level of cooperation between business, science, and the state, improving conditions for startup development.
Adapting to global trends	Use of artificial intelligence, blockchain, and Internet of Things (IoT) technologies to respond flexibly to market changes.	Ensuring economic stability in the face of global challenges, strengthening integration into the international economy.
Innovative approaches to financing	Attracting venture capital, crowdfunding, and digital platforms for financial transactions.	Increasing access to financial resources and boosting entrepreneurial activity.
Digitalization of business processes	Implementation of CRM systems, ERP platforms, and big data analysis.	Increase transparency, reduce operating costs, and improve interaction with customers and partners.
Promoting economic growth of the country	Increase in tax revenues, intensification of economic activity through support of SMEs.	Accelerating the pace of economic development, improving macroeconomic stability.
Increasing the country's competitiveness	Using SME innovations to develop national industries and strengthen their position in the international market.	Strengthening the country's global image and improving its position in global economic development rankings.
Improving the welfare of the population	Increasing incomes of citizens through the creation of innovative products and services.	Reducing poverty and increasing social stability.
Solving global problems	Implementing innovations to combat climate change, poverty, and resource scarcity.	Participation in achieving sustainable development goals, positive contribution to international initiatives.

Source: compiled by the authors.

Given the rapid development of digital technologies, today's digital economy has such important aspects as access to the Internet, e-commerce, digital infrastructure, and the active use of information and communication

technologies (ICT) in enterprises. These components allow SMEs to adapt to new conditions and use digital technologies to ensure their sustainability and growth (Table 2).

Table 2

**Characteristics of the components of the digitalization level**

Components	Description
Internet connection	A fast and stable Internet connection is the foundation for an efficient digital economy. It enables businesses and consumers to conduct online transactions, access information and resources, and ensure continuous communication. Internet connectivity is critical to supporting digital business models and e-services.
E-commerce	It is the process of buying and selling goods and services through online platforms. It includes not only traditional online stores, but also various business models such as marketplaces, electronic auctions, and subscription services. The development of e-commerce stimulates the growth of global trade relations and provides small businesses with access to international markets.
Digital infrastructure	This is the technical basis of the digital economy, which includes hardware, software, networks, databases, telecommunications, and human capital that allows companies to implement new technologies and automate processes. An efficient digital infrastructure ensures stability and growth in the digital economy.
Employee engagement in ICT	This component covers the degree to which information and communication technologies (ICT) are integrated into the workflow. This includes not only technical skills, but also the ability of employees to adapt to new digital tools to increase productivity. ICT engagement requires ongoing training and skill development of employees, which contributes to the efficiency of organizations.

Source: compiled by the authors.

To develop a development strategy in the digital economy, it is important for SMEs not only to assess their internal strengths and weaknesses, but also to be able to take into account external factors that may affect their operations. This will allow them to use digital technologies more effectively and adapt to the new business environment.

One of the most effective tools for analyzing and evaluating all the factors that can contribute to or hinder the

development of an SME is an integrated SWOT model. The first step in its application is to identify the strengths and weaknesses of the enterprise, as well as opportunities and threats from the external environment. Based on this analysis, a standard SWOT model is built, which allows us to clearly see the main aspects for further actions in the digital economy (Table 3).

Table 3

**SWOT analysis of SMEs in the digital economy**

Factor	Strengths	Weaknesses	Opportunities	Threats
<i>Internal factors:</i>				
1. Innovation	rapid adaptation to new technologies	limited budget for investing in innovation	development of new products and services based on digital technologies	difficulty in maintaining competitiveness due to high competition
2. Technological base	availability of modern digital technologies and tools for small businesses	lack of skills in digital project management	use of new technologies to automate processes and reduce costs	outdated technologies that need to be updated or replaced
3. Business flexibility	ability to quickly change strategies and business models	low scalability for expansion to new markets	attracting new customers through online platforms and digital channels	lack of resources to scale to the global level
4. Human capital	young and digitally-adapted employees	lack of experience in implementing digital technologies at the strategic level	staff development through online courses and digital training	high staff turnover and instability in the IT labor market
5. Management efficiency	simplification of management processes with the help of digital tools	lack of tools to automate management decision-making	use of analytics to improve efficiency and planning	delays in decision-making due to insufficient use of data
<i>External factors:</i>				
1. Competitive environment	increasing competition creates incentives for innovation and service improvement	small businesses cannot always compete with large corporations	small companies can fill vacant niches or create unique products	a lot of pressure from large enterprises that have more resources for investment
2. Market conditions	market expansion due to globalization and the development of online commerce	dependence on changes in international markets and economic crises	development of online platforms for selling goods and services	fluctuations in the economy may lead to a decrease in demand for products/services
3. Technological progress	technological developments are opening up new opportunities for digital transformation	rapid changes in technology can be challenging for small businesses	utilizing new technologies to improve productivity	rapid evolution of technology can lead to outdated systems and technologies
4. Legislative environment	liberalization of legislation could facilitate access to markets and resources	insufficient stability of legal norms in the field of digital technologies	simplifying the rules for starting an online business and e-commerce	regulations that limit digital innovation or create additional costs
5. Access to financing	increase the number of support programs for SMEs in the digital economy	limited access to credit due to high financial risk	attracting investment in digital startups and innovative projects	insufficient funding and lending for small businesses due to economic instability

Source: compiled by the authors.

The results of the analysis indicate the same overall weight of internal and external factors, which emphasizes the equivalence of their impact on the development of SMEs in the digital economy. Strengths, such as business innovation and flexibility, provide an opportunity to adapt

to a rapidly changing environment. Weaknesses, including insufficient technological base and management skills, need to be improved through investments in digital tools and staff training. External opportunities, such as technological advances and increased access to digital markets,

are conducive to growth. Threats, such as competition and difficulties in accessing finance, require adaptive strategies.

To effectively use their capabilities and overcome challenges, SMEs should focus on implementing the latest technologies, upgrading their staff's skills, and developing analytical tools for making management decisions.

Based on the analysis of the matrices of aggregated internal and external factors, as well as the results obtained, it can be concluded that the most effective strategy for small and medium-sized enterprises in the digital economy is to use the opportunities of the external environment to overcome internal weaknesses.

For example, businesses can take advantage of government and non-government grants to increase their resource base, modernize technologies, and expand access to relevant information. Another promising area is cooperation with scientific institutions in research projects and participation in innovation partnership programs, which will help strengthen the position of enterprises in a competitive environment and increase their adaptability to the challenges of digital transformation. These measures will allow businesses to strengthen their capacity and integrate more effectively into the digital economy.

**Conclusions.** The digital economy profoundly influences all aspects of modern life, reshaping industries, societal interactions, and the functioning of small and medium-sized enterprises (SMEs). For SMEs to remain competitive in this rapidly changing environment, they must continually adapt to new technological advancements and

capitalize on the opportunities presented by digital transformation. This includes the adoption of innovative tools, optimizing processes, and expanding their market presence through digital platforms.

Further research in this area is crucial to deepen the understanding of how digital technologies impact SMEs and their transformation processes. Such studies should aim to develop effective strategies, policies, and support mechanisms that enable businesses to navigate the challenges of digitalization while enhancing their sustainability. It is particularly important to explore the influence of the digital economy on enterprises operating in specific sectors and regions, as well as to examine how digitalization intersects with ethical and social considerations, such as data privacy, digital inclusion, and workforce displacement.

Additionally, identifying the critical factors for successful digitalization, such as organizational readiness, leadership capabilities, and access to technological infrastructure, is essential. This knowledge can guide the creation of practical tools and frameworks to support SMEs in overcoming barriers to digital transformation, helping them to thrive in an era of constant innovation and dynamic change.

Thus, the digital economy presents both challenges and opportunities, serving as a powerful driver of innovation and growth. By leveraging digitalization strategically, businesses can unlock new horizons, enhance their competitive edge, and contribute to the broader economic development in an increasingly interconnected world.

#### References:

1. Bayraktar, M., & Algan, N. (2019). The importance of SMEs on world economies. International Conference on Eurasian Economies. Retrieved from [https://www.researchgate.net/publication/345358967\\_The\\_Importance\\_Of\\_SMEs\\_On\\_World\\_Economies](https://www.researchgate.net/publication/345358967_The_Importance_Of_SMEs_On_World_Economies).
2. Innovatsiina diialnist pidpriemstv [Innovative activity of enterprises]. Derzhavna sluzhba statystyky Ukrainy. (n.d.). Retrieved from <https://stat.gov.ua/uk/datasets/innovatsiyna-diyalnist-pidpriemstv-1> [in Ukrainian].
3. Bradač Hojnik, B., & Huđek, I. (2023). Small and medium-sized enterprises in the digital age: Understanding characteristics and essential demands. *Information*, No. 14(11). P. 606. DOI: <https://doi.org/10.3390/info14110606>.
4. Holl, A., & Rama, R. (2024). SME digital transformation and the COVID-19 pandemic: A case study of a hard-hit metropolitan area. *Science and Public Policy*, No. 51(6). Pp. 1212–1226. DOI: <https://doi.org/10.1093/scipol/scae023>.
5. Restrepo-Morales, J. A., Ararat-Herrera, J. A., & López-Cadavid, D. A. (2024). Breaking the digitalization barrier for SMEs: A fuzzy logic approach to overcoming challenges in business transformation. *Journal of Innovation and Entrepreneurship*, No. 13. P. 84. DOI: <https://doi.org/10.1186/s13731-024-00429-w>.
6. Romero, I., & Mammadov, H. (2024). Digital transformation of small and medium-sized enterprises as an innovation process: A holistic study of its determinants. *Journal of Knowledge Economy*. DOI: <https://doi.org/10.1007/s13132-024-02217-z>.
7. Pro skhvalennia Stratehii tsyfrovoi transformatsii sotsialnoi sfery [Approval of the strategy for digital transformation of the social sphere]. Order No. 1353-p. (2020). Kabinet Ministriv Ukrainy. Retrieved from <https://zakon.rada.gov.ua/laws/show/1353-2020-%D1%80#Text>. [in Ukrainian].
8. Pro stymuliuvannia rozvytku tsyfrovoy ekonomiky v Ukraini [On stimulating the development of the digital economy in Ukraine]. Law No. 1667-IX. (2021). Verkhovna Rada Ukrainy. Retrieved from <https://zakon.rada.gov.ua/go/1667-20>. [in Ukrainian].

**Список використаних джерел:**

1. Bayraktar, M., Algan, N. (2019). The importance of SMEs on world economies. International Conference on Eurasian Economies. Retrieved from: [https://www.researchgate.net/publication/345358967\\_The\\_Importance\\_Of\\_SMEs\\_On\\_World\\_Economies](https://www.researchgate.net/publication/345358967_The_Importance_Of_SMEs_On_World_Economies)
2. Інноваційна діяльність підприємств. Державна служба статистики України. Retrieved from: <https://stat.gov.ua/uk/datasets/innovatsiyna-diyalnist-pidpryemstv-1>.
3. Bradač Hojnik, B., Hudžek, I. (2023). Small and medium-sized enterprises in the digital age: Understanding characteristics and essential demands. *Information*, Vol. 14, No. 11. Pp. 606. DOI: <https://doi.org/10.3390/info14110606>.
4. Hall, A., Rama, R. (2024). SME digital transformation and the COVID-19 pandemic: A case study of a hard-hit metropolitan area. *Science and Public Policy*, Vol. 51, No. 6. P. 1212–1226. DOI: <https://doi.org/10.1093/scipol/scae023>.
5. Restrepo-Morales, J.A., Ararat-Herrera, J.A., López-Cadavid, D.A. (2024). Breaking the digitalization barrier for SMEs: A fuzzy logic approach to overcoming challenges in business transformation. *Journal of Innovation and Entrepreneurship*, Vol. 13. Pp. 84. DOI: <https://doi.org/10.1186/s13731-024-00429-w>.
6. Romero, I., Mammadov, H. (2024). Digital transformation of small and medium-sized enterprises as an innovation process: A holistic study of its determinants. *Journal of Knowledge Economy*. DOI: <https://doi.org/10.1007/s13132-024-02217-z>.
7. Про схвалення Стратегії цифрової трансформації соціальної сфери: Розпорядження від 28.10.2020 р. № 1353-р. Кабінет Міністрів України. Retrieved from: <https://zakon.rada.gov.ua/laws/show/1353-2020-p#Text>.
8. Про стимулювання розвитку цифрової економіки в Україні: Закон України від 15.07.2021 р. № 1667-IX. Верховна Рада України. Retrieved from: <https://zakon.rada.gov.ua/go/1667-20>.