

DOI: 10.55643/fcaptp.2.67.2026.5114

Olena Fomina

D.Sc. in Economics, Associate Professor of the Department of Marketing, Lutsk National Technical University, Lutsk, Ukraine;
e-mail: o.fomina@lntu.edu.ua
ORCID: [0000-0002-6737-2189](https://orcid.org/0000-0002-6737-2189)
(Corresponding author)

Nataliya Olentsevych

PhD in Economics, Associate Professor of the Department of Management and Marketing, Kyiv National Linguistic University, Kyiv, Ukraine;
ORCID: [0000-0001-6700-8515](https://orcid.org/0000-0001-6700-8515)

Nataliia Hoholieva

PhD in Physical and Mathematical Sciences, Associate Professor of the Department of Higher Mathematics and Physics, State Higher Educational Institution "Donetsk National Technical University", Drohobych, Ukraine;
ORCID: [0000-0002-3436-5871](https://orcid.org/0000-0002-3436-5871)

Oleksandr Tyshko

PhD Student, Department of Enterprise Economics, State Higher Educational Institution "Donetsk National Technical University", Drohobych, Ukraine;
ORCID: [0000-0009-2683-6870](https://orcid.org/0000-0009-2683-6870)

Valerii Yankovskyi

PhD Student, Department of Enterprise Economics, State Higher Educational Institution "Donetsk National Technical University", Drohobych, Ukraine;
ORCID: [0000-0003-3998-6594](https://orcid.org/0000-0003-3998-6594)

Received: 19/12/2025

Accepted: 27/03/2026

Published: 30/04/2026

© Copyright
2026 by the author(s)



This is an Open Access article
distributed under the terms of the
[Creative Commons CC-BY 4.0](https://creativecommons.org/licenses/by/4.0/)

DIGITALIZATION AS A FACTOR OF SOCIO-ECONOMIC TRANSFORMATION OF SOCIETY

ABSTRACT

Digitalization represents a socio-economic phenomenon that reshapes lifestyles and economic behavior. Its active development allows for the well-grounded and balanced use of economic policy instruments aimed at strengthening the national economy and promoting social development. The purpose of this study is to determine the role of digitalization as a key factor in the socio-economic transformation of society and to substantiate the mechanisms through which it influences the economic system and the economic behavior of society.

Based on the analysis of the Digital Transformation Index and the Telecommunications Infrastructure Index, the current state of digital transformation in Ukraine is assessed. To model the dynamics of the Telecommunications Infrastructure Index and identify digitalization trends, the least squares method is applied to construct a linear time-series model. On the basis of the estimated regression model, a short-term forecast of digitalization processes is developed. The findings indicate that digitalization acts as a socio-economic phenomenon that fundamentally transforms lifestyles and the economic behaviour of citizens. This approach enables the rational and balanced application of economic policy instruments to influence national economic development. At the same time, particular attention is paid to risks associated with digitalization, including threats to information security, disclosure of personal data, and vulnerabilities related to the commercial, technological, and financial activities of firms and companies. The study also identifies the core principles underlying the transformation of social relations under the impact of digitalization.

Given the evolutionary features of the modern digital economy, there is a continuous need to monitor emerging technologies, as well as the benefits and risks associated with their implementation, responding promptly to new challenges. This approach supports the adoption of technologies that have been tested and proven effective in the market for information goods and services.

Keywords: digitalization, socio-economic development, information society, public policy, modeling of digital society, social transformation, telecommunications infrastructure index

JEL Classification: A14, O10, O33, L86

INTRODUCTION

The contemporary world is developing dynamically, and under the influence of digitalization, the processes of production and social interaction are undergoing significant transformation. Today, digitalization acts as a leading factor in the transformation of all spheres of human life, gradually modernizing the principles and mechanisms of their functioning, influencing the economic system and the economic behaviour of society. At an exceptionally high speed, digitalization creates new preconditions and development potential for the economy based on the use of modern digital technologies and enables the collection, processing, and consumption of extremely large volumes of information.

Over the past decade, digital technologies have emerged that contribute to radical changes in the organization of production and ensure increased efficiency in resource

utilization. According to estimates by PwC, the use of such a digitalization tool as artificial intelligence is capable of increasing global output by 15 percent over the next ten years (PwC, 2025). This process is accompanied by the intensification of economic activity and the development of fierce competition among market-based business structures. In sectors that actively adopt new digital solutions, a significant increase in profits is observed. Growing competition and new socio-economic challenges require the restructuring of business processes in line with new social values, priorities, and development benchmarks.

Intelligent technologies influence forms of social interaction, cause changes in communication patterns, and contribute to the transformation of social norms. Interpersonal communication is increasingly shifting from physical space to virtual environments and is more frequently conducted through social networks and messaging platforms. Digital tools help overcome linguistic and geographical barriers, enabling the rapid dissemination of information, new knowledge, and social experience.

Innovative technological solutions stimulate the development of new forms of leisure. In particular, entertainment formats such as streaming services and video games are gaining popularity, which affects the organization of leisure time among different social groups. Due to the rapid dissemination of cultural phenomena through digital technologies, processes of cultural globalization and transformations in the global environment are taking place.

The digitalization of public institutions and governance processes leads to the improvement of administrative practices in society and in business structures. It simplifies interaction between citizens and public authorities, ensures access to a wide range of administrative and social services, and accelerates procedures related to civil and economic activities. At the same time, digitalization conceals certain risks associated with breaches of information security, disclosure of personal and sensitive data of citizens, as well as commercial, technological, and financial aspects of firms' and companies' activities.

The expansion of digital technologies significantly affects the formation of ambiguous trends in the labor market. On the one hand, demand for specialists in new professions is increasing, including AI engineers, data processing specialists, and prompt engineers. On the other hand, millions of jobs may be eliminated or substantially transformed. According to estimates by the International Monetary Fund, approximately 60 percent of jobs in advanced economies and about 40 percent of jobs globally may be affected by the introduction of digital tools, particularly artificial intelligence (International Monetary Fund [IMF], 2024). Every economic agent and national economy pursuing development and progress must be prepared for such risks.

Thus, taking into account the evolutionary features of the modern digital economy and its impact on societal development, there is a need for continuous monitoring of the latest advantages and threats associated with digitalization. This requires timely identification of new risks and rapid responses to them. It is advisable to study both international and domestic experience in order to implement technologies that have already been tested and proven effective in the market for information goods and services. In the context of digital transformation, the structure of contemporary socio-economic systems requires comprehensive rethinking. Digitalization, as a strategic vector of societal development, determines the trajectory of economic modernization and social change in the coming decades. Therefore, research aimed at assessing the impact of digitalization on societal development is highly relevant.

LITERATURE REVIEW

Issues related to the development of information technologies and their impact on economic activity, social consciousness, and societal behavior have been widely examined in contemporary academic literature. Research in this field covers a broad range of topics, from analyses of fundamental philosophical aspects of the information society to empirical studies investigating the applied mechanisms of digital transformation of economic and social systems.

A significant body of research focuses on the conceptual foundations of the information society and the evolving relationship between the economy, society, and culture in conditions where information becomes a dominant factor of production (Rudskoi et al., 2022; Schwab, 2016). These studies emphasize that digital transformation represents one of the key drivers of sustainable economic development. Scholars highlight several major technological paradigms shaping this transformation, including Industry 4.0, digital ecosystems, smart city concepts, and environmentally oriented digital infrastructures. However, the transformation of social relations in the twenty-first century, their increasing network-based character, and the causal links between digitalization and sustainable development remain insufficiently explored. This is largely due to the rapidly changing logic of socio-economic development and the predominantly descriptive nature of many existing studies.

A number of studies analyze the relationship between digital technologies, innovation processes, and sustainable development. In particular, Robertstone and Lapiņa (2023) demonstrate that digitalization facilitates the formation of network-based business models, increases transparency in resource use, and stimulates the development of innovation systems. Empirical research examining the impact of digital technologies on economic growth is often based on multicountry panel models (David et al., 2025; Revenko et al., 2024). These studies reveal a significant positive impact of digital infrastructure development on productivity and economic dynamics, especially in developing countries. The expansion of broadband access and the development of digital skills create a multiplier effect that stimulates innovation and economic growth. At the same time, the effectiveness of digital transformation largely depends on institutional quality, the level of education, and the effectiveness of public policy.

At the global level, digitalization is also transforming the system of international economic relations by strengthening the role of e-commerce, digital logistics, and transnational digital platforms (Mogilna, 2025). Digital integration contributes to the reduction of trade barriers and the formation of new models of international cooperation. At the same time, it raises issues related to cybersecurity, digital sovereignty, and the regulation of digital trade. Existing regulatory frameworks remain fragmented, largely due to the slow adaptation of national legal systems to rapid technological change.

Empirical studies also confirm the systemic impact of digital technologies on socio-economic development. For example, Vărzaru and Bocean (2025) demonstrate a stable relationship between the level of digital transformation, human capital quality, and progress toward sustainable development goals in European Union countries. Their conceptual model integrates the Digital Economy and Society Index (DESI), gross domestic product indicators, and Eurostat statistical data. Similar conclusions are presented in the study by Al-Zoubi (2024), which shows that the development of the digital economy contributes to productivity growth, the emergence of new forms of employment, the acceleration of structural economic changes, and increased competitiveness of national economies. Additional insights are provided by Crișan et al. (2025), who analyze the development of digital infrastructure through bibliometric analysis and highlight its role in fostering international scientific cooperation.

At the same time, differences in the interpretation of digitalization and the uneven socio-economic development of European Union countries complicate the formation of a unified digital policy and a common trajectory of digital transformation. This also hinders the development of standardized approaches to digital service provision and coordinated digital governance systems.

Another important research direction concerns the impact of digitalization on public administration and human capital development. Xholo et al. (2025) propose a digital transformation index based on indicators of human capital development and gross output dynamics in South Africa. Their findings suggest that digitalization acts as an important factor in economic restructuring and human development, particularly in countries seeking to expand the use of intellectual labor. However, the study is limited to a relatively narrow set of indicators and does not account for environmental sustainability, social integration, cultural characteristics, or barriers to technology adoption. Moreover, the geographical focus on South Africa limits the generalization of the findings to other socio-economic systems.

A substantial part of contemporary research also examines the impact of digital technologies on business transformation. Buglea et al. (2025) show that digitalization significantly affects traditional sectors of the economy by increasing productivity and transforming business models, logistics processes, and consumer markets. Similar conclusions are presented by Nyagadza (2022), who argues that digital business models demonstrate higher levels of innovation, environmental sustainability, and adaptability to global crises such as the COVID-19 pandemic. Farfán Chilicaus et al. (2025) emphasize the key role of digital solutions in the post-pandemic recovery of the global economy, highlighting their contribution to market stabilization, the expansion of the online economy, and the development of social services. Nevertheless, the long-term structural consequences of digital transformation for economic systems remain insufficiently studied due to limited empirical data and the specific characteristics of post-pandemic economic dynamics.

Another stream of research focuses on the role of digital entrepreneurship and digital transformation in the development of business ecosystems. Chen and Zhang (2024) analyze the impact of digitalization on enterprise activity and the formation of digital business environments, emphasizing the importance of open data in the development of innovative digital solutions. Based on regression modeling using data from China, the authors demonstrate that open data generated by government institutions contributes to reducing transaction costs and increasing management efficiency, thereby becoming an important factor in business process transformation. However, research in this field still faces several methodological limitations, including fragmented statistical data, the absence of long-term time series, and difficulties in conducting dynamic comparative analyses under conditions of rapid technological change.

Despite the growing number of studies devoted to digital transformation, several important aspects remain insufficiently explored. In particular, limited attention has been paid to issues of digital sustainability, cybersecurity risks, governance of digital development, and the optimization of investments in digital infrastructure. These limitations are associated with the scarcity of reliable statistical data, their high volatility, and the instability of modern economic systems under the influence of global and domestic challenges. Furthermore, the lack of standardized methodologies for measuring digitalization complicates comparative analysis and restricts the application of advanced econometric modeling.

Overall, the existing literature confirms the growing importance of digitalization for economic and social development. However, the relationship between digital infrastructure development and broader socio-economic transformation remains insufficiently explored, particularly in the context of emerging economies such as Ukraine. Therefore, further research is needed to investigate the impact of digitalization on economic behavior, social interaction, and the long-term transformation of socio-economic systems.

AIMS AND OBJECTIVES

The aim of this study is to identify the role of digitalization as a key factor in the socio-economic transformation of society and to substantiate the mechanisms through which it affects the economic system and societal economic behavior. This approach enables the practical application of the identified mechanisms in public and corporate governance, as well as in the development of strategies for digital modernization.

To achieve the stated aim, the following objectives are pursued:

1. To determine the degree and development trends of digitalization processes in the Ukrainian economy.
2. To assess changes in the economic behavior of society resulting from the implementation of digital tools.
3. To identify objective barriers and risks associated with the process of digital transformation of society.
4. To formulate recommendations aimed at improving the effectiveness of digital technology implementation in socio-economic development.

METHODS

The main research hypothesis is that digitalization represents a key factor in the modernization of the socio-economic system and is capable of fostering sustainable socio-economic transformation.

The methodological framework of the study is based on an index-based approach. An assessment of the dynamics of the Digital Transformation Index and the Telecommunications Infrastructure Index is used to analyze the development of digitalization processes in Ukraine. On the basis of the dynamics of the Telecommunications Infrastructure Index, a linear time-series model is constructed using the least squares method.

The estimated regression model makes it possible to confirm the statistical significance of the upward trend in the Telecommunications Infrastructure Index and its close relationship with indicators reflecting the country's overall capacity for digital transformation. The adequacy of the model to the original time series is verified through residual analysis. The hypothesis of zero mean of the residuals is tested using the Student's t-test.

The randomness of deviations from the trend is assessed by analyzing the number of turning points in the residual series, while the independence of residuals is examined using the Durbin–Watson test. The conformity of the residual series to the normal distribution is evaluated using the RS test. The results of these statistical tests indicate that the residuals are normally distributed, independent, and do not exhibit autocorrelation.

Based on the conducted analysis, the examined time series is found to be stationary. The absence of a deterministic trend allows the constructed model to be applied for further analysis and short-term forecasting. On the basis of the estimated regression model, a short-term forecast of the Telecommunications Infrastructure Index is obtained.

In addition, a graphical method is applied to compare the dynamics of the Telecommunications Infrastructure Index and the Human Development Index in order to identify trends in societal change and to assess the relationship between technological infrastructure development and human development outcomes.

RESULTS

Assessment of the Degree of Economic System Transformation under the Influence of Digital Technologies

Since 2014, the European Commission has been monitoring the progress of EU member states in digitalization and publishing annual reports of the Digital Economy and Society Index (DESI). These reports include country profiles that enable member states to identify priority areas for policy intervention, as well as thematic sections providing an EU-level overview of key areas of digital policy (European Commission, n.d.).

Ukraine also conducts an assessment of the digital transformation of the economy and society; however, it applies a methodology different from the European DESI framework. In the Ukrainian context, digitalization is interpreted as an informational factor of production, a foundation of post-economic society, a key element of societal transformation, and a driving force of socio-economic change. The application of digital technologies in public processes contributes to mutual understanding between the state and citizens, strengthens trust, and enhances social responsibility. Digitalization also facilitates public awareness of reforms and supports reputation management and perception of state economic policy.

In Ukraine, the assessment of digital transformation encompasses eight structural components: institutional capacity of regional state administrations; access to the Internet; development of administrative service centers; implementation of a paperless regime; digital education; regional digital identity; penetration of basic electronic services; and sectoral digital transformation (Ministry of Digital Transformation of Ukraine, 2022, 2023).

By contrast, the European DESI methodology is based on four core dimensions. The first dimension relates to connectivity and access to the Internet. The second concerns digital skills and human capital. The third dimension focuses on the use of digital public services by citizens. The fourth dimension reflects the digital transformation of business and public administration, including cybersecurity policy, information protection, e-permitting, and e-democracy (European Commission, n.d.).

The Digital Transformation Index in Ukraine is measured on a scale from 0 to 1. The overall level of digitalization is estimated at 0.651, indicating a moderate degree of digital development. The level of digital public services provided to citizens (0.654) exceeds that of digital services provided to businesses (0.474). At the same time, the level of digital literacy remains relatively low: the indicator for individuals possessing only basic digital skills amounts to 0.460, despite a relatively high level of Internet access (0.683) (Ministry of Digital Transformation of Ukraine, 2022, 2023). This imbalance points to structural disproportions in the digital transformation process.

One of the essential aspects of digital transformation is societal informatization and the transition toward an information-based, post-economic society. Social interaction increasingly relies on the informational factor of production, the application of digital technologies, and the use of information as a means of production, a subject of labor, and a medium of exchange.

To assess the level of digitalization development at the national level, the Telecommunications Infrastructure Index (TII) is applied. This index provides information on the availability and quality of telecommunications services, the development of e-government and electronic services, citizens' access to information technologies, and the expansion of online education. A higher value of the Telecommunications Infrastructure Index indicates a more advanced digital economy and the emergence of new digital business models. This relationship is confirmed by studies published in reports by the United Nations and the World Bank, which emphasize the importance of telecommunications for economic and social development (United Nations, 2003–2024) and identify them as a key factor of economic growth and improvement in quality of life (European Commission, n.d.).

The Telecommunications Infrastructure Index is composed of several parameters, including Internet access, development of mobile networks, availability of high-speed Internet infrastructure, and Internet speed. Internet access reflects the level of broadband penetration and mobile connectivity, which constitute the foundation of digital economic development (United Nations, 2005–2024). Mobile network development indicates the number of subscriptions to mobile networks, particularly 3G and 4G (World Bank, n.d.). High-speed Internet infrastructure reflects the presence and expansion of fiber-optic networks and the deployment of new technologies such as 5G, which ensure high data transmission speeds (United Nations, 2005–2024). Internet speed reflects the average connection speed and the efficiency of Internet usage (World Bank, n.d.).

The analysis of this index enables countries to assess their international position by comparing their level of digital development with that of other states (Huawei, 2014–2020).

For Ukraine, which is actively pursuing digital transformation, the Telecommunications Infrastructure Index serves as an important instrument for evaluating the effectiveness of state strategies in the field of digital technologies. Ukraine has

the potential to improve its position in the Digital Transformation Index through enhanced Internet access, development of digital education, and improvement of digital services for both citizens and businesses (United Nations, n.d.).

Based on the analysis of the dynamics of the Telecommunications Infrastructure Index for Ukraine over the period 2005–2024 (Table 1), a linear time-series model is constructed using the least squares method (United Nations, n.d.).

Table 1. Telecommunications Infrastructure Index of Ukraine (TII).

Year	Telecommunications Infrastructure Index of Ukraine (TII)
2005	0,1161
2008	0,2336
2010	0,2487
2012	0,3535
2014	0,3802
2016	0,3968
2018	0,4364
2020	0,5942
2022	0,7270
2024	0,8428

The linear time-series model has the following form (Figure 1).

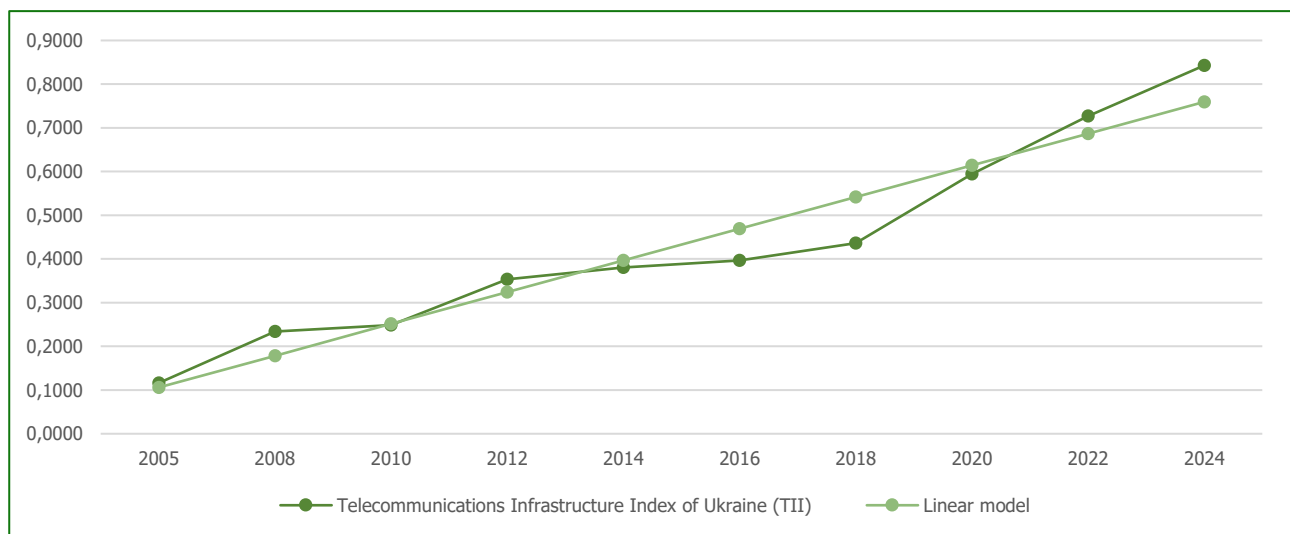


Figure 1. Linear model of the dynamics of the Telecommunications Infrastructure Index.

The linear time-series model takes the following form:

$$y = 0,0334 + 0,0726t. \quad (1)$$

The adequacy of the model (1) to the original time series is verified through residual analysis. In particular, the equality of the mathematical expectation of the residual series to zero is tested using the Student's t-test. The calculated value $t_{\text{факт}} = 2,67517\text{E-}14$ is lower than the critical value $t_{\text{табл}}(0,05, 9) = 2,262$, which confirms that the hypothesis of zero mean of the residuals is satisfied.

$$d > \left\lceil \frac{2}{3}(n-2) - 1,96 \sqrt{\frac{16n-29}{90}} \right\rceil = [2,96] = 2,$$

where d denotes the actual number of turning points in the random series; 1.96 is the quantile of the normal distribution corresponding to the 5% significance level. Square brackets indicate the integer part of a number.

As shown in Figure 1, the number of turning points is $d = 4$; therefore, the inequality is satisfied. Consequently, the examined series can be considered random.

The condition of independence of deviations from the parameters of the growth model is verified using the Durbin–Watson test, which indicates the absence of autocorrelation in the residuals.

The conformity of the residual series to the normal distribution is tested using the RS criterion:

$RS_{\text{факт}} = 3,29 \in (2,67; 3,69)$. It is concluded that the residuals of the examined series are normally distributed.

The constructed regression model (1) adequately describes the dynamics of the analyzed telecommunications infrastructure index, which is confirmed by statistically significant regression coefficients, a high coefficient of determination $R^2 = 0.9365$, and the absence of residual autocorrelation according to the Durbin–Watson criterion. The developed forecast demonstrates acceptable accuracy, as confirmed by the comparison of actual and forecasted values and by residual analysis.

Based on the conducted analysis, it is established that the examined time series (Table 1) is stationary. Statistical tests did not reveal the presence of a deterministic trend. This indicates that the level of the series does not change systematically over time, and its variation is explained by random factors. This property allows the model to be applied for further analysis and forecasting.

On the basis of the constructed regression model, a short-term forecast of the values of the telecommunications infrastructure index is obtained. The forecasted values are consistent with the previous dynamics of the series, indicating sufficient accuracy and practical applicability of the model for short-term forecasting. Thus, the model can be used to assess expected changes in the near future.

The rapid diffusion of information technologies and the digitalization of all spheres of human existence represent a global trend that significantly transforms modern society and its economy.

A comparative analysis of the growth rates of the telecommunications infrastructure index and the human development index of Ukraine over the period 2006–2024 is conducted (Table 2). Such a comparison provides information on the contribution of telecommunications development to human development.

Table 2. Comparison of the dynamics of the telecommunications infrastructure index of Ukraine and the human development index over the period 2006–2024. (Source: United Nations, n.d.; United Nations Development Programme [UNDP], n.d.).

Year	Telecommunications Infrastructure Index of Ukraine (TII)	Human Development Index (HDI)	TII growth rate	HDI growth rate	TII growth index	HDI growth index
2006	0,1161	0,762	–	–	–	–
2008	0,2336	0,776	101,206	1,837	201,206	101,837
2010	0,2487	0,782	6,464	0,773	106,464	100,773
2012	0,3535	0,789	42,139	0,895	142,139	100,895
2014	0,3802	0,788	7,553	–0,127	107,553	99,873
2016	0,3968	0,78	4,366	–1,015	104,366	98,985
2018	0,4364	0,784	9,980	0,513	109,980	100,513
2020	0,5942	0,783	36,159	–0,128	136,159	99,872
2022	0,727	0,772	22,349	–1,405	122,349	98,595
2024	0,8428	0,779	15,928	0,907	115,928	100,907

Growth of the Telecommunications Infrastructure Index was observed in 2008, 2012, 2020, and 2022. A significant surge in development occurred in 2008 (+101.2%), while a slowdown was recorded in 2016 (+4.37%). It can be noted that in the most recent analyzed period, the growth rate decelerated, decreasing from 22.3% to 15.9%.

In contrast to the Telecommunications Infrastructure Index, the Human Development Index exhibits four periods with negative growth rates. The deepest decline was observed in 2022 (–1.40%), as well as in 2016 (–1.02%). The highest growth rate of the Human Development Index was recorded in 2008 (+1.84%).

The average annual growth rate (CAGR – Compound Annual Growth Rate) is determined using the geometric mean formula. When substituting the actual series values, the average growth rates of the Telecommunications Infrastructure Index (TII) and the Human Development Index (HDI) are calculated using the following formula (Pyrozhevskiy et al., 2020):

$$CAGR_{TII} = \left(\frac{TII_{2024}}{TII_{2006}} \right)^{\frac{1}{n-1}} = 1,2464, \quad CAGR_{HDI} = \left(\frac{HDI_{2024}}{HDI_{2006}} \right)^{\frac{1}{n-1}} = 1,0024,$$

where: $CAGR_{TII}$ – the average growth rate of the Telecommunications Infrastructure Index; $CAGR_{HDI}$ – the average growth rate of the Human Development Index; TII_{2006} , TII_{2024} – the values of the Telecommunications Infrastructure Index for 2006 and 2024, respectively; HDI_{2006} , HDI_{2024} – the values of the Human Development Index for 2006 and 2024, respectively; n – the number of periods (in this study, $n = 10$).

The average annual growth rate of the Telecommunications Infrastructure Index (CAGR) over the entire observation period amounts to 12.64%, compared to 10.02% for the Human Development Index.

The calculated average growth rates indicate that during the period 2006–2024, the Telecommunications Infrastructure Index increased by a factor of 1.246 over a two-year interval, whereas the Human Development Index exhibited growth of only 1.002 over the same period.

The growth rate charts of the Telecommunications Infrastructure Index and the Human Development Index (Figure 2) illustrate the dynamics of changes in these indicators. The data presented in Table 2 and Figure 2 reflect the instability of the dynamics of the Telecommunications Infrastructure Index: periods of moderate growth alternate with periods of decline.

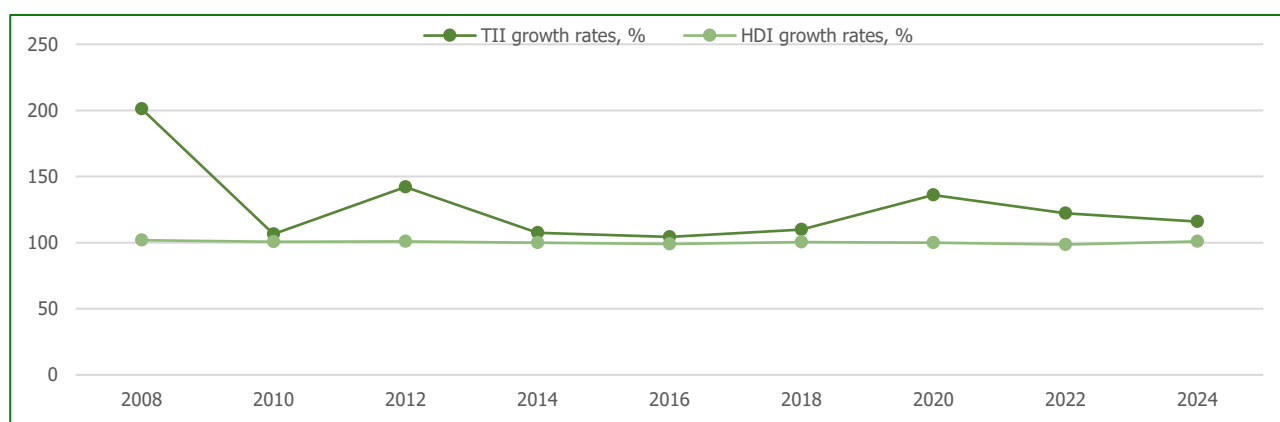


Figure 2. Dynamics of the growth rates of the Telecommunications Infrastructure Index and the Human Development Index.

The Telecommunications Infrastructure Index grows significantly faster and with a greater amplitude of fluctuations than the Human Development Index. The highest surge is observed in 2008 (over 200%), which can be attributed to the intensive development of information and communication technologies after 2006. Subsequently, growth rates stabilize but remain relatively high in 2012 and 2020. The declining fluctuations after 2022 may indicate the impact of external crises (military and economic) and investment constraints.

In comparison with the European assessment model (DESI), the Ukrainian approach is broader in structure, although it reflects the same key directions of digitalization. The value of the integrated Digital Transformation Index (0.651) indicates a moderate level of digitalization. Its strengths include Internet access and digital services for citizens, while its weaknesses relate to the level of digital literacy of the population and the availability of digital services for businesses.

The dynamics of the Telecommunications Infrastructure Index (TII) demonstrate stable and substantial growth over the period 2005–2024, which is confirmed by a statistically reliable regression model. Infrastructure emerges as a key driver of digital transformation, and its development constitutes a necessary condition for the implementation of digital services, e-government, and the formation of a post-economic society.

The Human Development Index in Ukraine can be assessed as relatively stable, as it exhibits only minor fluctuations around the 100% level. A comparison of the Telecommunications Infrastructure Index with the Human Development Index (HDI) shows that technological progress significantly outpaces socio-economic development. Despite the advancement of technological infrastructure, no substantial improvements in the quality of life, education, healthcare, or other socio-economic indicators have been observed in Ukraine. This suggests that the current growth of digital infrastructure has not yet been sufficiently translated into improvements in quality of life, education, and social standards.

A comparison of the Telecommunications Infrastructure Index with the Human Development Index (HDI) shows that technological progress significantly outpaces socio-humanitarian development. This implies that the current growth of digital infrastructure has not yet been sufficiently converted into improvements in quality of life, education, and social standards.

Thus, the degree of transformation of Ukraine's economic system under the influence of digital technologies can be assessed as progressive and intensive, yet uneven. The practical impact of digitalization will increase provided that technological development is balanced with the development of human potential, digital competencies, and integrated digital services for both businesses and the population.

Directions of Changes in the Economic Behavior of Society under the Influence of Digitalization

Since 2020, Ukraine has embarked on a full-scale course toward the digitalization of its economy. The digitalization of the economy requires not only the digital transformation of the public sector, but also an adequate level of knowledge among the population, which acts as the largest consumer of digital services. The key aspects of forming an effective digital system of the country are laid down in the Sustainable Development Strategy "Ukraine-2020" and further elaborated in the Sustainable Development Strategy up to 2030.

In this context, the sphere of administrative services is of particular importance, as it serves as an indicator of the effective functioning of the state apparatus. Over the past five years, Ukraine has actively developed a regulatory and legal framework for the digitalization of the economy. Furthermore, with the support of European partners, the country's development strategy has identified the main directions of digital development and IT products that are expected to become competitive not only in the domestic market but also internationally (Buglea et al., 2025).

In 2022, Ukraine's ICT sector generated USD 7.3 billion, accounting for 4.5% of GDP, which indicates its significant contribution to the national economy even under wartime conditions. In 2023, IT services accounted for 42% of the country's total exports of services, surpassing traditional sectors such as agriculture and energy. The information and communication technology sector demonstrates stable growth, increasing IT service exports by an average of 18.7% per year over the past ten years (Rudskoi et al., 2022; VoxUkraine, 2024; CSIS, 2024).

According to the findings of an independent study conducted by the Ukrainian Centre for European Policy, Ukraine's integration into the EU digital market could add between 2.4% and 12.1% to the country's GDP (USD 3.1–15.8 billion). This GDP growth would result from increased productivity, expansion of digital services exports, and reduction of trade barriers (Ukrainian Centre for European Policy [UCEP], 2024).

In the ranking of the E-Government Development Index (EGDI), Ukraine has improved its position by 45.5% over the past eight years, making it one of the best-performing countries among low- and middle-income economies (Table 3) (United Nations, n.d.).

Table 3. Dynamics of the E-Government Development Index (EGDI) and real GDP growth rates of Ukraine for 2016–2024. (Source: IT Ukraine Association, 2024; State Statistics Service of Ukraine, n.d.)

Year	Ranking position	EGDI value	Description of progress and achievements	Real GDP growth rates of Ukraine, %
2016	62	0.6073	Initial development of digital services	+2.4
2018	82	0.6165	Development of digitalization strategies	+3.5
2020	69	0.7119	Launch of the "Diia" portal, expansion of e-services	-3.8
2022	46	0.8029	Active digitalization despite wartime challenges	-28.8
2024	30	0.8841	Leadership in e-government, further development of "Diia"	+2.9

The growth of Ukraine's E-Government Development Index (EGDI) over the period 2016–2024 indicates increased efficiency and the active implementation of e-government instruments within the public administration system, which has a

direct impact on the country's financial and economic performance and overall economic development. The development and implementation of e-government contribute to the optimization of budget expenditures and expand access to public investment projects, thereby improving the overall investment climate. Simplification of state registration procedures and interaction with tax and regulatory authorities stimulates entrepreneurial activity and enhances the resilience of the economy under crisis conditions.

In particular, the digitalization of public services affects the dynamics of gross domestic product by increasing resource-use productivity and reducing transaction costs, while also stimulating investment inflows through enhanced transparency and institutional capacity of the state. The data indicate that after the severe GDP decline in 2022 (approximately –28.8%), Ukraine's economy began to recover, with growth of +2.9% recorded in 2024 (State Statistics Service of Ukraine, n.d.). At the same time, the EGDI continued to increase, indicating intensified digitalization of public services, which supported more efficient economic functioning, business activity, and administrative procedures under crisis conditions. Growth in the E-Government Development Index (EGDI) reflects not only the digital maturity of public administration but also indirectly affects financial and economic outcomes, particularly through the reduction of transaction costs, the lowering of administrative barriers for business, increased transparency of budgetary processes, and the stimulation of investment activity. The dynamics of EGDI in Ukraine correlate with real GDP indicators, confirming the economic feasibility of digitalizing public services even under crisis shocks.

According to research findings, the share of the IT sector in Ukraine's economy (approximately 5%) is already approaching the indicators of leading countries worldwide. For example, in Poland, the IT industry accounts for about 7% of GDP (VoxUkraine, 2024; IT Ukraine Association, 2024). Integration into the European Digital Single Market (DSM) will contribute to an increase in Ukraine's exports of goods to the EU by 11.8–17% and exports of services by 7.6–12.2% through the reduction of digital barriers (UCEP, 2024).

Digitalization significantly transforms population behavior by influencing consumer habits, expectations, and decision-making processes. The main aspects of this influence include the growth of online shopping, increased use of mobile devices, personalization of consumer experience, the impact of social networks, higher levels of awareness and consumer demands, and changes in consumption structure.

Thus, digitalization not only modernizes economic processes but also fundamentally transforms the behavior of society, shaping new models of consumption, communication, and participation in social processes. The depth of these changes is determined by the state's ability to adapt to global trends and to effectively integrate digital technologies into governance, service provision, and social development.

Barriers and Risks of Digital Transformation of Society

Ukraine ranks 54th out of 64 countries in the Digital Competitiveness Index (2022). The main reasons for this position are limited funding for innovation and weak support for startups. Although young people actively use digital services, 48% of individuals aged over 60 do not use the Internet at all, which creates digital inequality (VoxUkraine, 2024). According to data from the National Council for the Recovery of Ukraine from the Consequences of War, it is planned that by 2025, 95% of Ukraine's population will have access to high-speed Internet (CSIS, 2024). The expansion of high-speed Internet networks is therefore a key priority, as it enables the development of digital services in all regions of Ukraine, including rural areas.

An important component of digital transformation is the modernization of educational programs in digital technologies to ensure the availability of qualified personnel in the IT sector. Currently, about 20% of specialists acquire knowledge through non-formal education (VoxUkraine, 2024; IT Ukraine Association, 2024). Another critical issue concerns the creation of national grant programs and support for startup development. At present, startup support in Ukraine remains one of the weakest in Europe.

Thus, digitalization acts as a key catalyst of socio-economic change and becomes the foundation for the modernization of Ukraine's economic system. A comparison of the dynamics of the Telecommunications Infrastructure Index and the Human Development Index demonstrates that technological progress occurs at a much faster pace than improvements in social development parameters. This indicates the existence of a "digital gap" between the pace of infrastructure modernization and the capacity of the population and social institutions to fully utilize its potential.

The regression model confirms the statistical significance of the upward trend in the Telecommunications Infrastructure Index and its close relationship with indicators reflecting the country's overall capacity for digital transformation. It is revealed that the development of digital technologies correlates with institutional changes and the effectiveness of public administration. To scale digital transformation processes, there is an urgent need to improve parameters of human capital

development and to modernize social infrastructure. Therefore, the digital transformation of Ukraine's economy is a structural and systemic process, the successful implementation of which is possible only under conditions of synchronized development of technological, educational, and social components.

Recommendations for Increasing the Effectiveness of Digitalization of Socio-Economic Development

The development of the physical space of human life as a result of advances in science, engineering, and technology leads to the formation and expansion of information and communication technologies, which enhance coordination and digitalize the modes of informational influence on individuals. Digitalization as such forms a fundamentally new social reality in which social networks predominantly function as instruments of cognition, governance, and production. A key characteristic of these processes is the reduction or even replacement of previously dominant forms of direct interpersonal interaction, through which knowledge and experience, including behavioral experience, were transmitted, by predominantly technology-mediated forms of collective activity.

The digitalization of Ukraine's socio-economic development primarily manifests itself in the transformation of economic relations, mechanisms of production, distribution, exchange, and consumption, as well as in changes in financial and managerial processes. The digitalization of socio-economic relations is carried out on the basis of such principles as equality, quality, efficiency, comprehensiveness, and security. The principle of equality manifests itself in ensuring equal access for every economic entity and every member of society to services and information provided through the use of digital technologies. The principle of quality implies the provision of high-quality services and information, as well as their continuous improvement. In particular, through the application of digital communications, it becomes possible to obtain services in healthcare, education, culture, employment, entrepreneurship, and public support.

The principle of efficiency assumes that the use of digital technologies contributes to increased productivity and competitiveness, drives the transformation of economic spheres of activity, and changes the foundations of economic relations. The principle of comprehensiveness presupposes that, with state support, a holistic and progressive development of various levels of social interaction takes place, whereby the state creates favorable conditions for this development through the application of digital technologies in areas such as the educational environment, entrepreneurial activity, and the digital economy.

The principle of security provides for the implementation of information security measures, cybersecurity, protection of personal data, respect for privacy, and safeguarding of users' rights in the digital environment. All these principles are reflected and implemented within the Digital Transformation Index, which provides information on changes in the economic behavior of society under the pressure of digitalization.

The digital transformation of social reality determines a new quality of relations in production, distribution, exchange, and consumption. It enables time savings in the execution of transactions accompanying these processes and leads to changes in the economic behavior of a social type. Economic behavior under new conditions facilitates a more comfortable existence of society, as the availability of information promotes the alignment of interests in accordance with mutual orientations and expectations, while individual benefits derived from achieving goals increasingly converge with societal benefits.

Thus, digitalization makes it possible to level the conditions of interaction among all economic actors and to satisfy individual and collective needs at various levels.

Social transformations occurring under the influence of digitalization have both positive and negative aspects. On the one hand, they create new opportunities for the development and self-realization of members of society. On the other hand, they entail risks of social isolation, dependence on technology, and loss of privacy.

Digital technologies are actively used by governments to enhance the participation of economic actors and to ensure feedback mechanisms in the implementation of state socio-economic policy. At the macro level of social interaction, information policy is implemented, and a corresponding information space is formed, aimed at organizing processes of information creation, dissemination, and storage within social systems, as well as ensuring control over these processes and maintaining information security in society. A significant influence on these processes is exerted by social Internet networks, which serve as instruments of social communication and an important element in the implementation of state information and socio-economic policy. State information policy acts as a universal social mechanism for defining goals, objectives, principles, and conditions for implementing societal development priorities through the formation of a unified information space that takes national interests into account and ensures information security at various levels of social relations.

An important factor in ensuring a high level of digital transformation is a strong legal and regulatory framework that guarantees public access to official documents. In practice, any document passing through government institutions—except for those classified due to national security considerations and explicitly defined by law—is publicly accessible. This creates a positive feedback loop between the population and the government, fostering public trust and contributing to the country's internal development.

Investment in future-oriented technologies promotes the development of medical research, healthcare systems, carbon-free energy, responsible agriculture, sustainable transport infrastructure, as well as culture and creative industries. As a result, favorable conditions are created for scientific research and the emergence of new areas of entrepreneurial activity. Economic systems that actively implement digital technologies generally provide higher-quality public services due to advanced ICT infrastructure, widespread Internet access, and accumulated experience of digital transformation across both the public and business sectors.

DISCUSSION

The linear model of the dynamics of the Telecommunications Infrastructure Index demonstrates an upward trend in the scale of economic digitalization and can be used to assess future changes in business organization and social relations. However, forecasts based on the proposed model are time-limited, as they are adequate only for short-term periods of socio-economic dynamics. In addition, the application of this model is relevant for countries with a medium or below-average level of digitalization, such as Ukraine, whereas reproducing the proposed analytical methodology for leading digital economies (e.g., Singapore, Denmark, South Korea) would be methodologically inappropriate. It is also necessary to consider the possibility of changes in index calculation methodologies and in the set of indicators monitored by the Ministry of Digital Transformation of Ukraine and analyzed in this study. This entails interpretative risks and the risk of changes in the projected development trend. At the same time, digitalization represents a continuous process that affects all spheres of social life and constitutes a complex system of interrelated economic, technological, and institutional factors.

A substantial increase in the Telecommunications Infrastructure Index is observed over the period 2005–2024, which can be explained by the convergence of public and private interests in the development of digital infrastructure and by increased investment in this area. The dynamics of the index are presented in Table 1 and graphically illustrated in Figure 1. The investment effect is consistent with the findings of (Huawei, 2014–2020), which demonstrate a relationship between the development of communication networks, the Telecommunications Infrastructure Index, and a country's level of digital maturity, and is further confirmed by the linear regression model (Equation 1). Moreover, the dynamics of the Telecommunications Infrastructure Index support classical economic theory concepts regarding the transition of society to the post-industrial stage based on the development of information networks and technologies. Empirical results confirm the hypothesis that technological infrastructure in Ukraine is developing faster than the socio-economic components of the system, while digital skills are improving more slowly than the pace of innovation adoption and digital infrastructure expansion (European Commission, n.d.).

After 2019, digital transformation became an integral part of state policy in Ukraine. The Ministry of Digital Transformation was established, the "Diia" project was introduced and effectively implemented, and digital services for the population were expanded. As a result, the index of digital public services increased, and the accessibility of digital services for citizens improved. The results of this study are consistent with previous research (Rudskoi et al., 2022), international reviews (World Bank, n.d.; United Nations, n.d.), and reports (European Commission, n.d.; UCEP, 2024), which emphasize the leading role of public policy in the implementation of digital transformation. The findings indicate that progress in digital public services in Ukraine outpaces the digitalization of business and the development of human capital.

The conducted research is comparable to studies on digitalization in South Africa (Xholo et al., 2025), which apply different analytical tools under varying conditions of societal digitalization. This study compares the Human Development Index with the Telecommunications Infrastructure Index. Differences in the dynamics of these indicators can be explained by the slower pace of social change, as infrastructural breakthroughs occur rapidly, whereas society requires time to adapt to these changes. The level of digital skills, education quality, and income growth increase gradually against the background of technological change; therefore, the introduction of innovations and infrastructure development leads to gradual improvements in quality of life. Conclusions regarding the prioritization of digitalization of the public sector and the advanced development of public services in Ukraine are consistent with and further supported by the findings of (VoxUkraine, 2024; CSIS, 2024).

The war in the country contributes to the digitalization of social relations and to the improvement of Ukraine's position in global rankings. Digitalization facilitates changes in social norms, communication practices, and forms of social relations.

Digital communication platforms, social networks, and instant messaging applications have a revolutionary impact on interpersonal communication by eliminating temporal and geographical barriers, which is of particular importance during external shocks. Digital technologies enable the exchange of messages and information on a global scale within seconds, transforming the dynamics of human interaction and creating new forms of social ties. Online presence influences human behavior by reshaping social identity and social norms. A study (European Commission, n.d.) assesses the digital world in the context of COVID-19 and the development of the post-COVID economy; however, it does not account for the war in Ukraine, as it evaluates only EU member states with established socio-economic relations.

An important aspect of the present study is the analysis of societal development during periods of crisis, in particular in 2014, 2016, and 2022 in Ukraine, and the visualization of these processes in Figure 3. This is consistent with (CSIS, 2024) and the indicators presented in (United Nations, n.d.), which are explained by military and political shocks, a decline in infrastructure investment, and confirm the hypothesis regarding the sensitivity of digital indices to external influences.

Traditional approaches are commonly applied to assess the impact of digitalization on societal development. However, they are valid only under conditions of stable governance models and a stable institutional environment. When applied to economies under crisis conditions and external shocks, difficulties arise due to uncertainty in the behavior of economic agents and the influence of digital technologies on decision-making processes.

The proposed method for assessing the impact of digitalization on societal development, in contrast to approaches presented in (European Commission, n.d.; United Nations, 2003–2024; Huawei, 2014–2020), incorporates social components of the Human Development Index, enables the comparison of infrastructural and social indicators, and is formalized through a regression model. The analysis of a 20-year period of digital change, taking human development into account, allows for a deeper examination of transformations in societal development using econometric methods.

The limitations of the study include the potential non-linearity of real processes, in particular S-shaped development trajectories, as well as the absence of long-term forecasts.

Prospects for further research include expanding the set of indicators, in particular by incorporating assessments of the impact of artificial intelligence on societal development, as well as analyzing data on the digital skills of the population.

CONCLUSIONS

Digitalization acts as a socio-economic phenomenon that transforms lifestyles and the economic behavior of citizens. Its active development enables the reasoned and balanced use of economic policy instruments for strengthening the national economy and promoting the social development of society.

1. The assessment of the degree of transformation of Ukraine's economy based on the analysis of digital transformation indices demonstrates that digital technologies constitute a key factor in the modernization of the economic system. An analysis of the dynamics of the Telecommunications Infrastructure Index (TII) of Ukraine for the period 2005–2024 reveals stable growth, which can be adequately described by a linear model. Statistical tests confirm that the model satisfies the main statistical requirements: the mathematical expectation of residuals equals zero, the residual series is random, autocorrelation is absent, and the residual distribution follows a normal law. The high value of the coefficient of determination confirms the quality of the model and its ability to adequately describe the dynamics of the Telecommunications Infrastructure Index.
2. Stationarity tests indicate the absence of a deterministic trend, which confirms the stability of the series and the possibility of applying the model for forecasting purposes. In Ukraine, as well as in EU countries, a steady growth of digital indicators is observed, reflecting the active development of digital infrastructure, online services, and digital platforms. A comparison with European methodologies reveals structural differences but confirms the general trend toward deepening digital integration in production and governance processes.
3. The implementation of digital tools has significantly transformed the economic behavior of society by increasing the role of online interactions, fostering the development of digital competencies among the population, and facilitating the introduction of digital business models and e-government. An analysis of the dynamics of the E-Government Development Index (EGDI) for 2016–2024 indicates that the IT sector is gradually becoming one of the key drivers of Ukraine's economic development. It demonstrates high resilience and growth capacity, increasing by 45.5% over the past eight years, even under crisis conditions.
4. The rapid improvement of Ukraine's position in e-government rankings and the projected economic benefits from integration into the EU digital market confirm the strategic importance of digitalization. This is evidenced by the

growth of exports of goods from Ukraine to the EU by 11.8–17% and exports of services by 7.6–12.2%. Behavioral changes are manifested in the growth of Internet consumption, the development of e-commerce, digital services, data mobility, and the increased participation of citizens in social and political processes through digital channels.

5. Theoretical analysis and the examination of practical experience make it possible to identify objective barriers and risks accompanying the digitalization of economic activity and social interaction. These are primarily driven by the lag of human development and professional skills behind technological processes and the demands of the digital economy, as well as by the slow adaptation of legislation, education systems, and governance to the progressive requirements of contemporary development. As a result, the potential of digitalization is not fully utilized.
6. Overcoming these challenges requires continuous monitoring, scientific justification, and practical solutions, starting from public policy and extending to the entrepreneurial sector and the population. The development of digitalization should contribute to strengthening social integration, enhancing the competitiveness of the national economy, and ensuring sustainable socio-economic development.
7. To increase the effectiveness of digital transformation, it is recommended to ensure compliance with the key principles of digitalization: equality, quality, efficiency, comprehensiveness, and security. It is necessary to intensify efforts aimed at minimizing the risks of digital inequality, cyber threats, loss of privacy, technological dependence, and strengthening information security. This requires the activation of state information policy, further improvement of the regulatory and legal framework, and ensuring transparency and openness of government institutions. Support should be provided for attracting investment into knowledge-intensive digital production and innovative technologies. There is also a need for the continued development of digital infrastructure and the expansion of online service provision.
8. The proposed recommendations make it possible to expand the set of parameters used to assess the impact of digitalization on societal development and, in the long term, to evaluate the potential for the implementation of the digitalization process in Ukraine in comparison with other countries worldwide.

Prospects for further research include expanding the analytical toolkit by incorporating indicators of population digital skills, the use of artificial intelligence, the level of business digitalization, and the assessment of the impact of digital technologies on labor productivity and the financial sustainability of the economy. The application of nonlinear models and panel data analysis is appropriate for cross-country comparisons and for evaluating the long-term effects of digital transformation.

ADDITIONAL INFORMATION

AUTHOR CONTRIBUTIONS

All authors have contributed equally.

FUNDING

The Authors received no funding for this research.

CONFLICT OF INTEREST

The Authors declare that there is no conflict of interest.

REFERENCES

1. Al-Zoubi, W. K. (2024). *Economic development in the digital economy: A bibliometric review. Economies*, 12(3), 53. <https://doi.org/10.3390/economies12030053>
2. Buglea, A., Cișmașu, I. D., Gligor, D. A. G., & Jurcuț, C. N. (2025). *Exploring the impact of digital transformation on non-financial performance in Central and Eastern European countries. Electronics*, 14(6), 1226. <https://doi.org/10.3390/electronics14061226>
3. Chen, K., & Zhang, S. (2024). *How does open public data impact enterprise digital transformation? Economic Analysis and Policy*, 83, 178–190. <https://doi.org/10.1016/j.eap.2024.06.007>
4. Crișan, G.-A., Belciu, A., & Popescu, M. E. (2025). *Digital transformation – One step further to a sustainable economy: A bibliometric analysis. Sustainability*, 17(4), 1477. <https://doi.org/10.3390/su17041477>
5. CSIS. (2024). *Digital will drive Ukraine's modernization. https://www.csis.org/analysis/digital-will-drive-ukraines-modernization*

6. David, L. K. et al. (2025). *Digital transformation and socio-economic development in emerging economies. Technology in Society*, 81, 102834. <https://doi.org/10.1016/j.tech-soc.2025.102834>
7. European Commission. (n.d.). *Digital Economy and Society Index (DESI)*. <https://digital-strategy.ec.europa.eu/en/policies/desi>
8. Farfán Chilicaus, G. C., Licapa-Redolfo, G. S., Arbulú Balles-teros, M. A., Corrales Otazú, C. D., Apaza Miranda, S. J., Flores Castillo, M. M., Castro Ijiri, G. L., Guzmán Valle, M. D. L. Á., & Arbulú Castillo, J. C. (2025). *Digital transformation and sustainability in post-pandemic supply chains: A global bibliometric analysis of technological evolution and research patterns (2020–2024)*. *Sustainability*, 17(7), 3009. <https://doi.org/10.3390/su17073009>
9. Georgieva, K. (2024, January 14). *AI will transform the global economy. Let's make sure it benefits humanity*. International Monetary Fund. <https://www.imf.org/en/Blogs/Articles/2024/01/14/ai-will-transform-the-global-economy-lets-make-sure-it-benefits-humanity>
10. Huawei. (2014–2020). *Global Connectivity Index (GCI)*. <https://www.huawei.com/en/industries/ict-ecosystem/global-connectivity-index>
11. IT Ukraine Association. (2024). *Digital Tiger: The power of Ukrainian IT–2023*. <https://itukraine.org.ua>
12. Ministry of Digital Transformation of Ukraine. (2022). *Digital transformation index of Ukrainian regions: 2022 summary*. https://drive.google.com/file/d/1a-tOr16Ahzl_BSk1M7bif4y3CRIfmFRC/view
13. Ministry of Digital Transformation of Ukraine. (2023). *Digital transformation index of Ukrainian regions*. <https://thedigital.gov.ua/storage/uploads/files/page-community/reports/Індекс-цифрової-трансформації-регіонів-України-2023.pdf>
14. Mogilna, L. (2025). *The impact of digitalization on the transformation of international economic relations. Economy and Society*, 72. <https://doi.org/10.32782/2524-0072/2025-72-64>
15. Nyagadza, B. (2022). *Sustainable digital transformation for ambidextrous digital firms: Systematic literature review, meta-analysis and agenda for future research directions. Sustainable Technology and Entrepreneurship*, 1(3), 100020. <https://doi.org/10.1016/j.stae.2022.100020>
16. PricewaterhouseCoopers. (2025). *A look at using artificial intelligence without fear: The global AI employment barometer*. <https://www.pwc.com/ua/uk/survey/2025/vv-korystannya-shtuchoho-intelektu-vplyv-na-rynok-pratsi.html>
17. Pyrozkhov, S. I., Ryazantseva, V. V., Motoryn, R. M. et al. (2020). *Statistics*. Kyiv National University of Trade and Economics. <https://doi.org/10.31617/p.knute.2020-164>
18. Revenko, D., Romanenkov, Y., Polozova, T., Lebedchenko, V., & Molchanova, K. (2024). *The impact of digitalization on the economic growth of the European Union: An empirical study. Eastern-European Journal of Enterprise Technologies*, 3(13(129)), 46–56. <https://doi.org/10.15587/1729-4061.2024.304256>
19. Robertsons, G., & Lapina, I. (2023). *Digital transformation as a catalyst for sustainability and open innovation. Journal of Open Innovation: Technology, Market, and Complexity*, 9(1), 100017. <https://doi.org/10.1016/j.joitmc.2023.100017>
20. Schwab, K. (2016). *The fourth industrial revolution*. World Economic Forum. https://law.unimelb.edu.au/data/assets/pdf_file/0005/3385454/Schwab-The_Fourth_Industrial_Revolution_Klaus_S.pdf
21. State Statistics Service of Ukraine. (n.d.). *Gross domestic product*. <https://stat.gov.ua>
22. United Nations. (2003–2024). *E-Government Development Index (EGDI)*. <https://composite-indicators.jrc.ec.europa.eu/explorer/indices/egdi>
23. United Nations. (2005–2024). *Telecommunication Infrastructure Index (TII)*. <https://www.un.org/development/desa/dpad/>
24. United Nations. (n.d.). *United Nations e-Government Survey*. <https://publicadministration.un.org/en/Research/UN-e-Government-Surveys>
25. United Nations Development Programme. (n.d.). *Ukraine: Human Development Index*. <https://hdr.undp.org/data-center/human-development-index>
26. Värzaru, A. A., & Bocean, C. G. (2025). *Systemic interactions among digital transformation, sustainable orientation, and economic outcomes in EU countries. Systems*, 13(10), 914. <https://doi.org/10.3390/systems13100914>
27. VoxUkraine. (2024). *Digital economy of Ukraine: Key development factors*. <https://voxukraine.org/digital-economy-of-ukraine-key-development-factors>
28. World Bank. (n.d.). *Information and communication technologies*. <https://www.worldbank.org/en/topic/ict>
29. Xholo, N., Ncanywa, T., Garidzirai, R., & Asaleye, A. J. (2025). *Promoting economic development through digitalization: Impacts on human development, economic complexity, and gross national income. Administrative Sciences*, 15(2), 1–27. <https://doi.org/10.3390/admsci15020050>

Фоміна О., Оленцевич Н., Гоголева Н., Тишко О., Янковський В.

ДИДЖИТАЛІЗАЦІЯ ЯК ФАКТОР СОЦІАЛЬНО-ЕКОНОМІЧНОЇ ТРАНСФОРМАЦІЇ СУСПІЛЬСТВА

Мета дослідження полягає у визначенні ролі диджиталізації як ключового фактора соціально-економічної трансформації суспільства та обґрунтування механізмів її впливу на економічну систему й економічну поведінку соціуму.

На основі аналізу Індексу цифрової трансформації та Індексу телекомунікаційної інфраструктури було здійснено оцінку стану цифрової трансформації в Україні. Для побудови лінійної моделі динаміки Індексу телекомунікаційної інфраструктури та оцінки тенденцій диджиталізації було застосовано метод найменших квадратів. На основі побудованої регресійної моделі розроблено нетривалий прогноз процесів диджиталізації. Установлено, що диджиталізація функціонує як соціально-економічне явище, що трансформує спосіб життя та економічну поведінку громадян. Такий підхід дозволяє раціонально та збалансовано застосовувати інструменти економічної політики для впливу на розвиток національної економіки. Також звернута увага на певні ризики, пов'язані з процесом диджиталізації, зокрема пов'язані з порушенням інформаційної безпеки, розкриттям персональної інформації й особистих даних громадян, комерційних, технологічних і фінансових аспектів діяльності фірм і компаній. Визначено принципи, що лежать в основі трансформації соціальних відносин під впливом диджиталізації.

Диджиталізація є соціально-економічним феноменом, який трансформує спосіб життя та економічну поведінку громадян; її активний розвиток дозволяє обґрунтовано й зважено використовувати інструменти економічної політики для розбудови національної економіки й соціального розвитку суспільства. Ураховуючи особливості еволюції сучасної цифрової економіки, потрібно постійно проводити моніторинг новітніх технологій, переваг і загроз їх упровадження, оперативно реагуючи на нові ризики, і так упроваджувати у власну діяльність лише ті технології, що вже пройшли випробування та зарекомендували себе на ринку інформаційних товарів і послуг.

Ключові слова: диджиталізація, соціально-економічний розвиток, інформаційне суспільство, державна політика, моделювання цифрового суспільства, трансформація суспільства, індекс телекомунікаційної інфраструктури

JEL Класифікація: A14, O10, O33, L86