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KEY FACTORS AND STRUCTURES OF THE DEVELOPMENT OF THE DIGITAL TRANSFORMATION OF THE ECONOMY

Abstract. The article explores the impact of technological innovations on the economy and business in the context of digital transformation. It is investigated that key technological trends, such as 5G, Wi-Fi, energy-efficient processing, advanced data recognition, and intellectual data processing, cloud, and edge computing, converge to form the technological foundation necessary for successful digital transformation. As a result, digital transformation is often accompanied by significant losses, and costs exceeding the planned ones, and many projects lead to changes that do not justify expectations from the use of information technologies. Investments in analytics are necessary but do not guarantee a global restructuring of the business, its core transformation, during which even a minor error can halt the supply chain, destroy a product, or even put an end to the business. It is noted that to achieve success, it is necessary to prioritize strategy over technology. Under these conditions, the task of goal-setting comes to the forefront – it is necessary to start with defining the ultimate goal of the business (profit, perspective, strengthening market position, etc.) and only then move on to the search for technology that will allow achieving it. As businesses focus on providing greater mobility for employees, moving most corporate workflows to cloud storage, digitization provides staff with access to what they need and when they need it, supporting a high level of productivity regardless of location. The article also examines the constructs of economic development in the context of information technologies, focusing on the development of ecosystems of crypto assets, metaverses, and non-fungible tokens (NFTs), central bank digital currencies (CBDC), institutional investments in the digital economy, and tokenization of traditional funds. It is emphasized that these



technological and economic transformations define new directions of development and require increased attention to cybersecurity, technological infrastructure, and collaboration between business and technical teams.

Keywords: digital transformation, technological innovations, economic impact, cloud computing, crypto assets, NFT, cybersecurity.

Problem statement. The global economy has entered a period of incredible development in new technologies that are transforming human economic activities and shaping the direction of future generations. Breakthroughs in communication, biotechnology, quantum computing, artificial intelligence, the metaverse, industrial robotics, and elements of space economics open up exceptional prospects for the development of humanity, changing the principles of management and determining the high-productivity target function of direct production. In such circumstances, the investigation of key factors and constructs of the digital transformation of the economy is determined by the importance of adapting modern society to new realities and challenges brought about by digital transformation. Significant changes in the economic landscape give rise to a series of complex problems that require the attention of researchers, policymakers, and practitioners.

Analysis of recent research and publications. The interdisciplinary exploration of factors and constructs in the development of digital transformation in the economy has been the focus of numerous domestic and international experts. Notable scholars such as S. Obikhod, M. Rudenko, I. Tokmakova, S. Malov, A. Khediger, W. Ganemann, T. Bush, S. K. Singh, and others have delved into the overarching concept of digital transformation in economic systems. Researchers like N. Kovalenko, Z. Gambarov, V. Komandrovskaya, E. Abad-Segura, M. D. Gonzalez-Zamar, and others have scrutinized the impact of digitization on industrial growth.

A considerable body of scientific works presents the outcomes of fundamental and empirical studies on the greening of the economy, facilitated through economic business processes. Scholars such as O. Shevchenko, A. Strilets, Zh. Md. Khudzari, G. Kurian, B. Tartakovsky, G. Raghavan, and others contribute to the discourse on ecological aspects. However, according to the authors, the question of the opportunities and benefits of simultaneous industrial, digital, and economic development remains open.

Article objective. The aim of this article is to examine and analyze key aspects of the digital transformation of the economy in the context of the modern world undergoing intensive development of new technologies.

Presentation of the main material. Digital technologies permeate all aspects of life, transforming traditional sectors of the economy, education, healthcare, and culture [1, p.161]. Information technologies are capable of reshaping almost every element of a business process, providing an opportunity to discover new methods of



conducting business and expanding its scope. In turn, such a trend can pose serious threats, as competitors and innovators introduce similar new technological business models, and internal restructuring processes may lead to self-disruption and a reevaluation of how value is created.

Many companies today are focusing on core business strategies and unique value propositions, constructing improvements aimed at confronting competitors and creating a positive image in the eyes of the public. The importance of these transformations is higher than ever because they can alter the fundamental basis of a company's value creation, impacting its worth and directly influencing brand perception, relationships with customers and suppliers, product sales, and much more.

Numerous transformations have already taken place, but even more lie ahead, as a significant portion of businesses is directing their focus towards next-generation opportunities [2, p.135]. To achieve this, many companies are laying the foundations for future production, constructing the necessary digital infrastructure, attempting to align digital investments with strategic value, and seeking their approval and acceptance from both customers and employees.

As a result, digital transformation is often accompanied by significant losses, costs exceeding planned estimates, and many projects lead to changes that do not justify the expectations of using information technologies. Investments in analytics are necessary but do not guarantee a comprehensive business overhaul, a pivotal transformation that, if not carefully executed, can disrupt supply chains, destroy products, or even bring an end to the business itself.

Currently, to achieve success, it is essential to prioritize strategy over technology. Under these conditions, goal-setting becomes paramount – one must start by defining the ultimate goal of the business (profit, perspective, market position strengthening, etc.) and then proceed to search for the technology that enables achieving those objectives. The deployment of a communication system is indispensable, as it is the only means to ensure the effectiveness of collaboration between business leaders and technology experts. Without a mutual understanding, the strategy may stall, and the transformation may become overly dependent on technology, leading to short-term gains but lacking the necessary long-term dynamics essential for rethinking business processes.

As an illustrative example, consider a standard foundational transformation project involving analytics and artificial intelligence. A common issue faced by these projects is information distortion and data incompleteness: the inability to obtain the required level of understanding and forecasting of clients due to scattered data; using different databases as information sources; divergent priorities and differentiated strategies; and varying terminological apparatus. In these conditions, the risk of misunderstanding is very high. Consequently, the resolution of such complex projects typically involves the collaboration of multiple stakeholders,



collectively aiming to find a superior operational analytics model and a new data-centric thinking approach.

When business and technology teams fail to understand each other, and their incentives do not align, the business is prone to compromising decision-making through information technology. Without collaboration between business teams and technical experts, the endeavor may be reduced to data processing technologies rather than the necessary management for streamlining decision-making. Once the new data infrastructure is deployed, the challenge arises in sustaining project adoption, mainly because the analytics strategy often needs to be more balanced with artificial intelligence, as it is typically part of machine learning.

The technological foundation required for digital transformation is shaped through the convergence of high-speed 5G and Wi-Fi connections, energy-efficient processing, advanced data recognition, and intelligent data processing, as well as cloud and edge computing [3, p.252]. Together, these innovations significantly impact various industries, enabling automakers to create future cars with software control, allowing manufacturing companies to enhance their automation and control capabilities, providing access to new levels of real-time data for making more informed decisions across operations and empowering the logistics business to elevate intelligence and efficiency in supply chain management.

As businesses focus on ensuring greater employee mobility by moving most corporate workflows to cloud storage, digitization provides staff with access to what they need, when they need it, supporting high levels of productivity regardless of location.

Based on this data, we can identify constructs of economic development and transformation under the influence of information technologies:

1) Development of the cryptocurrency ecosystem. The evolution of the digital

asset ecosystem has become a powerful force. As of 2023, the market capitalization share of Bitcoin reached its minimum, dropping to 40%, amid the active growth of new digital instruments such as IoT services, machine learning, robotics, cloud computing, virtual reality, etc [4]. This shift highlights the strengthening positions of companies with existing market recognition and the restructuring of less successful ones attempting to improve their market positions in the long run. Economic Darwinism is becoming prevalent, leading only companies with good management and public recognition to survive. Reputation change and restoration continue to be determined by institutional investors who demand greater control, risk management, transparency, and reality verification.

2) Development of metaverses and non-fungible tokens (NFTs) positioned as

modeled digital environments incorporating augmented, virtual, and extended realities, as well as blockchain with social network elements, are on the rise. New



applications in production, healthcare, education, culture, and other environments require advancements in identification technologies and even AR/VR devices (e.g., Apple XR project).

Similarly, the NFT market is experiencing a revival. Moving beyond being a standalone source of value in the digital art and collectibles field, it is now focused on digital proofs of origin and authenticity. This technology allows anyone to claim ownership of any digital art object, with its value determined solely by what it represents. As of 2023, the global NFT market is estimated at \$26.9 billion [4]. The scope of NFT applications has expanded from supply chain and logistics to healthcare, real estate, and retail, playing an increasingly significant role in the digitization of operations.

3) Rise in the concentration of central bank digital currencies (CBDC).
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increase in the concentration of digital currencies, particularly Central Bank Digital Currencies (CBDCs), is notable as central banks collaborate with commercial banks and technology providers to strengthen their positions for testing, launching, and implementing unique digital currency strategies. Currently, over 80% of the world's central banks are considering the possibility of launching CBDCs [5;6], indicating that CBDCs are becoming a reality, and the establishment of a global standard is plausible in the near future. Furthermore, commercial banks are showing growing interest in this space, collaborating with central banks and software providers to ensure the success and widespread adoption of this application of information technologies.

4) There has been a significant surge in institutional investments in the digital

economy. Beyond cryptocurrencies, these investments are closely intertwined with traditional market movements and the overall economy, as the productivity of the domain heavily depends on global economic trends. Irrespective of market tendencies, the volume of tokenization of traditional "blue-chip" funds (such as Kohlberg Kravis Roberts & Co and Hamilton-Lane partnering with Securitize) is increasing, making them more accessible to investors. Moreover, an increasing number of high-capitalization market players are venturing into the tokenization space (including JPMorgan, HSBC, Fidelity, and Goldman Sachs), leading to a notable spike in merger and acquisition activity in the sector [7;8].

Investments in venture capital funds focused on the blockchain ecosystem (not cryptocurrency funds) are expanding due to the fact that they become the most attractive during the recession. In addition, due to the recent stabilization of the cryptocurrency market, the popularity of profitability estimation in the blockchain ecosystem is increasing.

Conclusions. In conclusion, we note that the automation of the processes of the domestic economy is determined by the outlined directions, the provision of



which will require an increase in appropriations for cyber security, the development of technological infrastructures, innovative solutions, and the promotion of interaction between business and technical teams.

References:

1. Bobro N. (2023). New trends in economics: digitization. *Nauka i tekhnika sohodni - Science and technology today*, 14(28), 160-167. [https://doi.org/10.52058/2786-6025-2023-14\(28\)-160-167](https://doi.org/10.52058/2786-6025-2023-14(28)-160-167) [in English].
2. Syam, N., Sharma, A. (2018). Waiting for a sales renaissance in the fourth industrial revolution: Machine learning and artificial intelligence in sales research and practice. *Ind. Mark. Manag.* 69, 135–146. [in English].
3. Hanemann, U. (2019). Examining the application of the lifelong learning principle to the literacy target in the fourth Sustainable Development Goal (SDG 4). *Int. Rev. Educ.* 65, 251–275. [in English].
4. Statista.com. Retrieved from: <https://www.statista.com/statistics/377382/bitcoin-market-capitalization/> . [in English].
5. Bush, T. (2018). Research on educational leadership and management. *Educ. Manag. Adm. Leadersh.* 46, 359–361. [in English].
6. Singh, S.K. (2019). The human side of management. *Int. J. Educ. Manag.* 33, 2–4. [in English].
7. Rifkin, J. (2011). The third industrial revolution: How lateral power is inspiring a generation and transforming the world. Basingstoke: Palgrave Macmillan. 256 p. [in English].
8. Towards the circular economy. Accelerating the scale-up across global supply chains. Ellen MacArthur Foundation. Retrieved from: <https://www.ellenmacarthurfoundation.org/assets/downloads/publications/Towards-the-circular-economy-volume-3.pdf> (data zvernennia: 25.11.2023). [in English].