

Characteristics of the digital transformation of innovation processes in the modern economy

Kateryna Lavrukhina, PhD in Economic Sciences, Associate Professor of Construction Economics Department¹ (ORCID: 0000-0003-2417-7153), **Oleksandr Kravchuk**, PhD in Technical Sciences, Associate Professor of Water Supply and Water Disposal Department¹ (ORCID: 0000-0001-6578-8896), **Oleksii Paharskyi**, student¹ (ORCID: 0000-0002-5538-0018)

¹ Kyiv National University of Construction and Architecture, 31, Povitryanykh Syl Avenue, Kyiv, Ukraine

ABSTRACT

The article examines the main characteristics of digital transformation in information processes within the modern economy, which serves as a key factor in economic development amidst global digitalization. Digital transformation affects all aspects of economic activity, including data digitization, process automation, the use of big data, artificial intelligence (AI), and machine learning. Additionally, cloud technologies significantly alter approaches to data management, providing flexibility and mobility to business processes.

Particular attention is given to information security, which is becoming an increasingly pressing issue due to the rapid growth in digital information volumes. The article analyzes new trends in the use of decentralized systems, such as blockchain, which ensure transparency and security in data exchange. Additionally, the potential of digital platforms as drivers of change in traditional business models and as enhancers of market interaction efficiency is discussed.

Keywords: digital transformation, artificial intelligence, innovation, innovative technologies, automation.

1. INTRODUCTION

The digitalization of information processes in the modern economy represents the implementation and integration of digital technologies across various sectors of economic activity. It encompasses the use of information technologies, digital platforms, data analysis, artificial intelligence, and other innovations to improve business processes and enhance resource management efficiency. Digitalization expands business capabilities, stimulates innovative development, and impacts all aspects of economic activity, transforming approaches to business operations and competition in global markets.

2. MAIN FEATURES OF THE DIGITAL TRANSFORMATION OF THE ECONOMY

Data Digitization: process automation, use of big data, artificial intelligence and machine learning, cloud technologies, information security, decentralization and blockchain, digital platforms - these features reflect fundamental changes in business practices and management approaches driven by digitalization, fostering innovation and sustainable economic development.

The development of artificial intelligence and automation technologies can significantly boost the global economy and enhance global prosperity at a time when aging populations and declining birth rates are slowing growth [3].

Innovation is the cornerstone of economic growth. It is often discussed in the context of information technologies, for example, ChatGPT became a central topic this year. However, innovation is also crucial in the manufacturing sector. This is especially critical for small and medium-sized enterprises (SMEs) as it allows them to grow faster and enter new markets.

New technologies and production processes help to increase productivity. This includes both modern equipment and new approaches to management and work organization.

Creating new products or services that meet the growing needs of consumers helps to expand a company's audience, both domestically and internationally. SMEs can successfully compete in foreign markets.

The growth of competitiveness becomes possible thanks to differentiation among competitors and the creation of unique offers, high-quality service and optimization of processes.

Resilience or the ability to adapt to changes is a key advantage of innovation in today's conditions, and this quality of Ukrainian enterprises will help them adapt to challenges even in the future.

Manufacturing companies around the world are facing extreme volatility, from the effects of the pandemic to disruptions in supply chains amid the full-scale conflict in Ukraine. For Ukrainian entrepreneurs, this storm, of course, turned out to be even stronger. However, there are many examples that testify to the readiness of Ukrainian companies to quickly adapt to new conditions.

At the same time, the development of technologies opens up new opportunities for solving many problems faced by manufacturing enterprises in conditions of economic instability. For example, artificial intelligence and machine learning are strengthening automation and allowing machines to perform more complex tasks without human intervention [4].

Undoubtedly, Ukraine and Ukrainian entrepreneurs face challenges that go beyond technology. However, the critical situation became a test for many businesses, which made it possible to reveal hidden potential even in difficult conditions. After overcoming these obstacles, this creative energy will find innovative applications that will help restart Ukraine's economy at a new level.

3. PRINCIPLES OF DIGITALIZATION OF THE ECONOMY

The digital economy is a type of economy where the key factors and means of production are digital data (binary, information, etc.) and network transactions, as well as their use as a resource, which allows to significantly increase the

efficiency and productivity of activities and the value for the products and services received.

Digitization should be considered as a tool, not as an end in itself. With a systemic state approach, digital technologies will stimulate the creation of jobs, increase productivity, rates of economic growth and the quality of life of Ukrainian citizens.

The principles of digitization include [5]:

- ✓ Ensuring equal access to services, information and knowledge with the help of digital technologies for all citizens.
- ✓ Creating benefits in various areas of life such as health care, education, jobs, entrepreneurship, agriculture and others.
- ✓ Use of digital technologies to increase the efficiency and competitiveness of the economy.
- ✓ Development of information society and mass media for social, cultural and economic development.
- ✓ International cooperation for integration into European and world markets.
- ✓ Standardization of digital systems and infrastructure for global competitiveness.

Active public administration for effective digital transformation of the country.

These principles determine the main directions and requirements for the development of the digital sphere in Ukraine, aimed at improving the quality of life of citizens, the development of business and the economy of the country as a whole.

3. KEY DIGITAL TRENDS IN UKRAINE

Digital technologies have become the basis for creating new products, values, properties and, accordingly, the basis for obtaining competitive advantages in most markets.

Transformations in industry are taking place according to the concept of "Industry 4.0" and with the emergence of cyber productions, cyber systems and cyber machines.

Opportunities created by the trend for Ukraine:

- ✓ Increasing the competitiveness of economic sectors.
- ✓ Development of digital economy, labor market, etc.
- ✓ Emergence of new industries (cross-platform with digital industry).
- ✓ Development of innovative entrepreneurship.

Digitization has given small companies and project teams the ability to create new products and bring them to market quickly on par with the big companies out there. This led to the beginning of the placement of "innovation centers" from large companies to small ones (startups, etc.) [5].

The main goal of the development of the digital economy in Ukraine:

- ✓ Make a technological leap in the Ukrainian economy. Move from consumption to creation of resources (key resources are data and electronic transactions).
- ✓ To significantly increase the competitiveness of the Ukrainian economy on global markets.
- ✓ Create new opportunities for businesses and citizens, namely:

1) the opportunity for Ukrainians to create their own business, using their intelligence and knowledge, due to the use of digital infrastructures and digital platforms;

2) the opportunity for every Ukrainian to become a generator of "own GDP" as part of the country's GDP [6].

Insufficient support for experts in the field of innovation systems and lack of unity among them are serious issues that

negatively impact the country's innovation potential and its sectors. It is worth noting that all components of Ukraine's innovation system—government, public institutions, and business associations—are highly developed, indicating their quality and creativity. However, the presence of strengths in some cases is offset by weaknesses, such as fragmented efforts or lack of coordination and strategic planning. Additionally, a global shortcoming is the absence of an effective national innovation strategy to support overall development across all sectors and industries [1].

Furthermore, it is important to meet the basic needs of the population living in conditions of wartime, which requires significant efforts. Therefore, in light of the current situation, innovation becomes one of the main sources of support for the functioning and development of Ukraine as a whole [2].

In summary, it should be noted that state support, along with international programs and experience, is extremely important for ensuring the development and effective operation of national enterprises through innovation activities.

Digitization will significantly increase labor productivity in Ukraine and become a powerful multiplier capable of launching the Ukrainian economy in the shortest possible time and ensuring its real growth.

Reference list

- [1] Lavrukina K., Tytok V., Shpakova H., Ivanova T., Shevchuk O., Biloshchytskyi A. Innovative Communication Technologies as a Factor in the Development of the Post-War Economy of Ukraine. *2024 IEEE 4th International Conference on Smart Information Systems and Technologies (SIST)*, Astana, Kazakhstan, 2023. P. 149–157
- [2] Lavrukina K., Tytok V., Chupryna K., Biloshchytska S., Novykova I, Maksyuta A., Scientific research of the impact of globalization challenges on the process of innovative and informational development of cluster structures of the construction industry of Ukraine. *2024 IEEE 4th International Conference on Smart Information Systems and Technologies (SIST)*. Astana, Kazakhstan, 2024, P. 62–69, DOI: 10.1109/SIST61555.2024.10629519. URL: <https://ieeexplore.ieee.org/document/10629519>
- [3] Program "Access to financing and support of sustainability of MSMEs in Ukraine". URL: <https://mmsp.bdf.gov.ua/>
- [4] Digital Spillover. Measuring the true impact of the digital economy. URL: https://www.huawei.com/minisite/gci/en/digital-spillover/files/gci_digital_spillover.pdf
- [5] Стратегія розвитку сфери інноваційної діяльності на період до 2030 року: затверджена постановою Кабінету Міністрів України від 10 липня 2019 року № 526-р. URL: <https://zakon.rada.gov.ua/laws/show/526-2019-%D1%80#Text>