

INFORMATISATION OF THE DIGITAL ECONOMY AS THE MAIN TREND OF EXPONENTIAL DEVELOPMENT

Victoria Marienko¹, Vitalina Nikitenko², Valentina Voronkova³

Abstract. The *relevance* of studying the informatisation of the digital economy as the main trend of modern development is beyond doubt, since the digital economy represents the main trend of digitalisation. Therefore, the world's largest developed countries consider the development of the digital economy as one of the important strategies for increasing national competitiveness, promoting economic growth and social development. The digitalisation of the economy is a fundamental and transformative trend in the world of technology and business. It encompasses the convergence of digital technologies with economic activity, leading to a profound impact on industries, societies and people's lives. The *purpose of the study* is to examine the theoretical and practical aspects of digitalisation of the digital economy as the main trend of modern development. *Methodology.* The paper uses the following methods and approaches: cross-cultural, systemic, structural-functional, institutional, anthropological and axiological, as well as general scientific methods – allowing to effectively analyse the ways of using digitisation to create new benefits. The article uses a data-centric approach to the analysis of information provision at an enterprise for the purpose of change management, which includes methods of collecting, structuring, documenting and reusing basic data generated by the change management processes. *Results.* The article elaborates on the directions of development of the digital economy as an economic form of big data; the directions of exponential development of information and trust in information sources; reveals the informatisation of the digital economy as the main trend of modern digital development. *Practical implication.* The informatisation of the digital economy creates both opportunities and challenges. Companies, governments and individuals must proactively adapt to this trend by adopting technology, prioritising data management, developing digital skills and adhering to ethical and responsible practices to unlock the full potential of the digital economy. The digitalisation of the economy is a transformative force with far-reaching implications. It represents a new era of rapid change and innovation, offering opportunities for growth and efficiency, but also creating challenges that require careful navigation. As this trend continues to evolve, it will shape the future of industries, economies and societies around the world.

Key words: informatisation, digital economy, big data, digitisation, information technology.

JEL Classification: O14, D83, O32

1. Introduction

The relevance of the research topic is that human society is rapidly entering the digital economy. About 38% of global GDP is accounted for by digitalisation, and by 2030, this share may exceed 70%. While disrupting many traditional industries, the digital economy has also opened up new channels for quality economic development. The digital economy is not only the fastest growing and most

dynamic new economic form in today's national economy, but also represents the future direction of industrial development that can effectively enhance economic resilience and risk management capabilities. In a sense, the speed and level of development of the digital economy will directly affect the economic structure and dominance of industrial development in the world in the future. That is why the world's largest developed and developing countries consider

¹ Engineering Institute of Zaporizhzhia National University, Ukraine
E-mail: marienko1987v@gmail.com

ORCID: <https://orcid.org/0000-0002-7727-2579>

² Engineering Institute of Zaporizhzhia National University, Ukraine (*corresponding author*)

E-mail: vitalina2006@ukr.net

ORCID: <https://orcid.org/0000-0001-9588-7836>

³ Engineering Institute of Zaporizhzhia National University, Ukraine

E-mail: valentinavoronkova236@gmail.com

ORCID: <https://orcid.org/0000-0002-0719-1546>

Researcher ID: T-2057-2017



the development of the digital economy to be one of the most important strategies for enhancing national competitiveness, promoting economic growth and social development, and are actively implementing big data, the Internet of Things, artificial intelligence and other areas.

2. Analysis of Recent Research and Publications

The article examines the theoretical and practical aspects of informatisation of the digital economy as a major trend in modern development based on the introduction of digital technologies, a concept that offers enormous benefits for improving health, efficient energy use, business and company development. In this case, it is important to focus on the study of these problems in the paper "Digitalization of society: implications and perspectives in the context of the psycho-dimensionality of social reality / psychosynertics" (2013) by Yershova-Babenko I., Kozobrodova D., Seliverstova A., Lysakova I., Oleksenko R.

An important role in this is played by the foreign experience of regional economic development (innovations, ecosystem, local self-government), presented in the article by Azhazha M. A., Fursin O. O., Wenger O. M. The analysis of the digital (network, platform) economy is presented in the paper "Machine, platform, crowd. How to tame our digital future" (2019) by McAfee A., Brynjolfsson E., which played a fundamental role in the analysis. The study was conducted in the context of the evolution of digital technologies of the industrial revolution from 4g to 5g and the challenges of digital globalisation, as reflected in Russell Stewart's work "Human Compatible: Artificial Intelligence and the Problem of Control" (2020).

The systematic analysis of the digital economy informatisation as the main trend of modern development is based on the article by Nambisan S., Zahra S. A., Luo Y. "Global platforms and ecosystems: Implications for international business theories" (2019). It has been proven that digitalisation and digital transformation have a special impact on companies, their culture, ways of working, and society, and digital platforms as new intermediary mechanisms, as well as the big data market, are among the key structural components of the digital economy (Polyakov & Kovshun, 2021).

Task statement. The aim of the study is the theoretical and practical aspects of information support for organisational management in the context of digitalisation. Objectives of the study: 1) to analyse the directions of using digitisation to create new benefits in the context of the development and implementation of the digital economy era; 2) to clarify the nature

and directions of development of the digital economy as an economic form, the key factor of production of which is data.

Materials and methods. The methods of analysis of information support of the digital economy include the method of system analysis and synthesis, structure-functional, Agile method and data-centric method, which are necessary for the implementation of information support of the digital economy. The data-centric approach is aimed at analysing the information provision at the enterprise for the purpose of change management. It is aimed at facilitating information exchange, data visualisation and information management, the database provides functions for queries, forms, reports. It can be used to provide useful business intelligence and decision support information for change management. A data-centric approach is required to analyse the information support for change management in an enterprise, including methods for collecting, structuring, documenting and reusing key data such as strategies, actions and events that are typically generated by change management processes. Other details such as attributes, primary and foreign keys, data types, and constraints can be configured (or defined by users) to meet their specific data requirements and business cases. To achieve enterprise agility, it can be useful for stakeholders to observe the environment in which the enterprise is located. To identify, capture, document and communicate changes in the driving forces in a timely manner. In this way, changes and indicators of change can be tracked and analysed.

3. Using Digitalisation to Create New Advantages in the Development of the Digital Economy

Ways to accelerate the development of the digital economy, use digitisation to create new development benefits and implement the digital economy have become the focus of global attention. The digital economy has such important characteristics as technological innovation, industrial integration, green development and information exchange. The elements of technological innovation represented by the digital economy are becoming the main driving force behind the new development momentum. Against the backdrop of slow growth and even recession in the global economy, digital transformation is essential, promising huge benefits for better health, more efficient energy use, business expansion and company prosperity (Andrushchenko, Yershova-Babenko, Kozobrodova, et al., 2022). Many Chinese companies have achieved global innovation capabilities in 5G communications, the Internet of Things and artificial intelligence. The digital economy is in a period of historic opportunity for vigorous

development. The next 5-10 years will be a period of significant development of Ukraine's digital economy, as well as a period of expanding digital opportunities in more areas and transforming traditional industries. The digital economy has become an important source of leadership in innovation and the development of the global digital economy, which is influenced and interconnected with digital education (Buhaichuk, Nikitenko & Voronkova, 2023).

At the same time, digital transformation has become an important driving force for enterprise modernisation and environmental change, and digitalisation with innovation as the "main theme" is becoming a key driver of economic and social development. It is necessary to promote the transformation of the "new infrastructure" to modernise traditional industries, accelerate the construction of new infrastructure such as large data centres and artificial intelligence, and create an efficient, intensive, affordable, safe and reliable modern infrastructure system. At the same time, it is necessary to promote the sharing of new infrastructure resources and joint construction of facilities, the sharing of space, and the increase of new kinetic energy of economic development. In the digital economy, information resources have become the main factor of production, so the open exchange of information resources should be given great importance. It should also be noted that the importance of network security has become more prominent with digital transformation and the rapid development of the digital economy, represented by foreign experience of regional economic development in the context of innovation, ecosystems and local governance (Azhazha, Fursin, Wenger, 2022).

It is necessary to strengthen the protection of key information infrastructure, promote the implementation of laws on personal data protection, etc., and build a strong line of defence for network security. The development of the digital economy is of great importance, as it means understanding the new opportunities of the new round of technological revolution and industrial transformation. During the pandemic, the digital economy suffered much less damage than the non-digital economy, and leading digital companies were less affected. A valuable lesson that businesses have learned from the pandemic is that digitalisation is not optional, but mandatory. Compared to other information resources, numbers can be reproduced, transmitted and calculated. In recent years, the issue of digitisation has been widely discussed, and it has unique benefits. Digitalisation involves the collection, transmission, storage, computation and application of data and refers to the process of converting a variety of complex and changing information into measurable data and

processing it. The digital transformation of an enterprise is a process in which an enterprise uses a new generation of digital technologies to link physical information about a specific production and operational link and even the entire business process to form valuable digital assets, as well as through calculations and feedback. Effective information, a process that ultimately increases the value of the company's business. Modern enterprises use digital technologies and tools to facilitate enterprise transformation in order to add digital value to the business value of enterprises and increase their competitiveness based on the platforms of the digital (network) economy presented in (McAfee & Brynjolfsson, 2019). Digital economy with data as a key factor for exponential development.

The digital economy is an economic form with data as a key factor of production, a modern information network as an important carrier and the use of big data. The digital economy not only plays an important role in expanding domestic demand, modernising consumption and making production more demand-driven, but also creates a wide range of efficient supply, structural optimisation and qualitative impact on development from the demand side. The healthy development of the digital economy contributes to building a new development model based on big data, artificial intelligence, quantum computing and the Internet of Things. Digital technologies and the digital economy can facilitate the rapid movement of various elements of resources, accelerate the integration of different market participants, help market participants restructure their organisational models, achieve cross-border development, overcome time and space constraints, and expand industrial and supply chains. The digital economy has a high level of innovation, high penetration and wide reach. A high level of innovation means that the digital economy can stimulate the innovative vitality of the modern economic system, create new products and services, and generate a double productive effect. Strong penetration means that the digital economy can penetrate widely into all parts of production, distribution, exchange and consumption. Because of the accelerated development of innovative technologies such as the Internet, big data, cloud computing, artificial intelligence and blockchain, digital technologies are fully integrated into the economy, politics, culture, society and the construction of ecological civilisation with new ideas and new formats. The effective development of the digital economy contributes to the construction of a modern economic system and the creation of an innovative and coordinated industrial system. It is conducive to the construction of a unified, open, competitive and orderly market system and the construction of

a multi-balanced, secure and efficient integrated open system. The economic system plays the role of the government, implements an effective market mechanism, the viability of micro-enterprises and the degree of macro-control in the context of the evolution of digital technologies of the industrial revolution from 4G to 5G.

If the database data standardisation work is done well, it will save a lot of effort in the data cleansing work. The study of data cleansing work is mainly based on methods to identify and eliminate similar duplicate records, and the recall rate and accuracy level used are also used. Most of the existing cleansing methods are used in isolation, and different cleansing algorithms are executed sequentially or alternately as a black box, and this method does not consider the interaction between different types of cleansing and simplifies the complexity of the problem, but this simplification may affect the quality of the final data cleansing. There is a lot of research on big data cleansing systems, not only on data consistency and object matching, but also on optimising a MapReduce-based data cleansing system. Specific application technologies and corresponding data cleansing algorithms are analysed below. Many data in the database violate the originally defined integrity constraints, there is a lot of inconsistent, contradictory and noisy data, so it is necessary to identify this incorrect data and then perform error cleansing. Qualitative error detection technologies are classified according to the degree of human involvement and stages of involvement. Most of the detection processes are fully automated, while some technologies require human involvement. The systematic analysis of the informatisation of the digital economy as the main trend of modern development is based on the paper "Information support of management in organisations as complex systems in the context of digitalisation" (Marienko, 2023).

4. Effective Development of the Digital Economy as a Factor of Informatisation and Big Data

The effective development of the digital economy contributes to the creation of new advantages in national competition. The accelerated integration of next-generation digital technologies such as big data, cloud computing, artificial intelligence, blockchain and the Internet of Things with the real economy has created endless opportunities for new industries and new models. These information technologies reflect a certain nature of business, but since they focus on general business problems, they do not affect the core systems of different industries, so the characteristics of the industry are not obvious, therefore, this reflects

the cross-sectoral characteristics of this type of software used to implement various types of recycling, circular economy as a factor of sustainable development.

With the continuous development of construction informatisation, the software has also begun to provide relevant information solutions aimed at the general problems of a certain industry, so this type of software and hardware has begun to show more obvious industry characteristics, such as government affairs, legal affairs, water conservation. With the further deepening of informatisation construction, information technology products begin to solve the company's own unique problems, and information technology products are gradually tied to specific business needs, thus demonstrating very strong business matching and customer differences. The business of the online industry is based on information technology, so from product creation, product marketing, product sales, product delivery, return collection, to the continuous operation of the business, appropriate technical systems are required to support it. Digitalisation and digital transformation have a particular impact on companies, their culture, ways of working, and society, and digital platforms as new intermediary mechanisms, as well as the big data market, are among the key building blocks of the digital economy (Polyakov & Kovshun, 2021).

Technology and technological progress play a crucial role in this regard. It should also be noted that different experts use these two terms ("digitalisation" and "digital transformation") in different contexts. For some, this difference may be trivial or even insignificant, but when it comes to a company and its strategy, these terms are very important. That's why every leader needs to understand the important difference between pure digitalisation and digital transformation. Tools such as forms, emails, websites, etc. often help to digitise existing analogue processes. Digitalisation is also often used synonymously with automation. Processes can be simply digitised or automated.

In this way, the entire digital process can be transformed into a single information process, which is crucial for the effectiveness of digital transformation, stimulating the economy, creating jobs and ensuring social progress (Safonov, Usyk & Bazhenkov, 2022).

5. Conclusions

Many people often confuse a data-centric approach with a data-driven approach. A data-centric approach is a method of collecting, analysing and extracting information from data. It is sometimes referred to as "analytics". A data-centric approach, on the other hand, is about using data to determine what one should build in the first place. A data-driven architecture

Table 1

Main directions of exponential development of information and trust in information sources

Development directions	Definition of the essence of exponential development
Social media	The emergence of social networks and online forums has greatly simplified the exchange of information. People can express their opinions, share their experiences and feedback. In this environment, the role of influencers and online influencers has grown exponentially.
Development of the information theory of power, known as information power	The exponential development of the information theory of credibility reflects the growing importance of this concept in the world of information technology and communications. Information credibility theory studies how information becomes authoritative and reliable in the eyes of information consumers, and how this affects decision-making and public opinion.
Dissemination of information	Due to the rapid dissemination of information on the Internet through social media, publications, blogs and other online resources, information can reach a wide audience very quickly. This can amplify the impact of authoritative sources and topics discussed.
Filtering information	The growing amount of information available on the Internet creates a need for tools to filter and assess the reliability of sources. The development of search algorithms and recommendations, as well as tools for determining the reliability of information, help users make better decisions.
Fighting disinformation	The exponential development of information theory means that measures to combat disinformation and fake news are becoming more effective. There is a growing emphasis on fact-checking, source analysis and tracing the origin of information.
Expanding role of personalities and influencers	The Internet allows people to build their own brand and become an authority in a particular industry or on a particular topic. This can lead to increased influence and credibility.
Data analytics and artificial intelligence	Data analytics and artificial intelligence can help determine the popularity and credibility of specific information sources and identify trends in authority.
Changing the paradigm of perception of power	With the development of information technology and access to a variety of information, the concept of authority can change. Some users may trust traditional sources, while others may consider online experts and bloggers to be authoritative.
Manipulation of the authorities	In a world where information is spreading faster than ever, there is a threat of manipulation of the authorities and fake sources of information. This underscores the importance of critical thinking and developing skills in evaluating sources.
Development of recommendation algorithms	Companies developing online platforms are increasingly focusing on recommendation algorithms. These algorithms can influence what information users see and shape their opinions about the credibility of certain sources.
Greater importance of source credibility	Due to the general availability of information, users are increasingly paying attention to the credibility of the source. This may include checking the reputation, assessing the objectivity and reliability of the source.
Role of education and media literacy	The growing volume of information and changes in its perception require the development of media literacy skills. People need to learn how to distinguish truthful information from disinformation and identify authoritative sources.
Increasing importance of the fact selected	In many cases, users are looking for information that aligns with their own beliefs or desires. This can affect the perceived credibility of a source, especially if it supports their views.
International dimension	The exponential development of information theory in defining credibility also takes into account the global nature of information and credibility. Information can quickly cross borders and influence the global public, and the issue of information reliability is of international importance.
Increased role of factors that determine trust	It is important to understand that trust can be determined by a variety of factors, such as expertise, experience, reputation, community support, and many others. Developing more precise methods for determining these factors can help ensure that trust is measured objectively.
Strengthening the emphasis on dialogue and openness	Through social media and interactive platforms, dialogue and openness are becoming key aspects of building trust. Openness to feedback and a willingness to listen to users can increase the credibility of authoritative sources.
Greater emphasis on dialogue and openness	It can increase critical thinking and help users make informed decisions in a world overloaded with information.

Source: compiled by the authors

is a system in which data is the primary and constant asset and applications are changing. Data-driven architecture means building technologies, skills and environments by ingesting massive amounts of data. For data analysts and machine learning engineers, a model-centric approach may seem more appealing. Data is crucial for modern machine learning. The best approach is a hybrid approach that focuses on both data and model. The key to informatisation and digitalisation is technology, and the integrated use of digital technologies serves to create profits and competitive outcomes through innovative strategies, products and experiences.

1. The transformative power of digitisation in shaping the landscape of the digital economy is thus undeniable. As businesses, governments and individuals continue to adopt digital technologies, new opportunities for growth, innovation and efficiency are emerging. To remain competitive in this evolving ecosystem, organisations must take a proactive approach to harnessing the potential of digitisation, whether through digital transformation initiatives, data-centric decision-making or cybersecurity measures.

2. The article emphasises that digitisation is not just a technological shift, but a strategic imperative for modern enterprises. By using data analytics, cloud computing, artificial intelligence and other digital tools, businesses can gain a competitive advantage in the digital economy. Moreover, the importance of

developing a culture of innovation and adaptability cannot be overstated, as the pace of technological change shows no signs of slowing down.

3. One of the key findings is that the digital economy is not limited to a specific industry or sector; it permeates all aspects of society. Governments also play a key role in shaping the digital landscape by creating a favourable regulatory environment and investing in digital infrastructure. Cooperation between the public and private sectors is essential for sustainable growth in the digital age.

4. While digitalisation offers enormous opportunities, it also brings challenges, especially in terms of cybersecurity and data privacy. Therefore, it is crucial for organisations to prioritise cybersecurity measures and follow ethical data practices to build trust with customers and stakeholders.

5. Thus, the digital economy is a dynamic and evolving ecosystem that offers numerous benefits to those who can harness its potential. Embracing digitisation as a strategic driver of growth and innovation is essential for businesses and governments alike. As this digital journey continues, the ability to adapt, innovate and prioritise security will be key to success in the ever-expanding digital economy.

These conclusions summarise the key points and ideas of the article, emphasising the importance of digitisation in the context of the digital economy and the need for proactive strategies to harness its benefits while addressing the challenges it presents.

References:

- Andrushchenko, V., Yershova-Babenko, I., Kozobrodova, D., Seliverstova, A., & Lysakova, I. (2022). Digitalization of society: implications and perspectives in the context of the psycho-dimensionality of social reality / psychosynetics. *Amazonia Investiga*, vol. 11(56), pp. 183–195. DOI: <https://doi.org/10.34069/AI/2022.56.08.19>
- McAfee, A., & Brynjolfsson, E. (2019). *Machine, platform, crowd. How to tame our digital future*. Kyiv: Nash Format, 336 p.
- Voronkova, V., Nikitenko, V., Oleksenko, R., Andriukaitiene, R., Kharchenko, Ju., & Kliuinenko, E. (2023). Digital Technology Evolution of the Industrial Revolution From 4G to 5G in the Context of the Challenges of Digital Globalization. *TEM Journal*, vol. 12, issue 2, pp. 732–742. Available at: https://www.temjournal.com/content/122/TEMJournalMay2023_732_742.pdf
- Education of Ukraine under martial law (2022): management, digitalization, European integration aspects: Book of Abstracts of the IV International Scientific and Practical Conference (electronic scientific publication), October 25th. Kyiv: SSI "Institute of Educational Analytics", 2022, 360.
- Marienko, V. Y. (2022). Information support of management in organisations as complex systems in the context of digitalisation. Modern scientific strategies of development: collective monograph / Compiled by V. Shpak; Chairmen of the Editorial Board S. Tabachnikov. Sherman Oaks, California: GS Publishing Services, pp. 62–81. DOI: <https://doi.org/10.51587/9781-7364-13395-2022-008>
- Nambisan, S., Zahra, S. A., & Luo, Y. (2019). Global platforms and ecosystems: Implications for international business theories. *Journal of International Business Studies*, vol. 50(9).
- Polyakov, M., & Kovshun, N. (2021). Diffusion of innovations as a key driver of the digital economy development. *Baltic Journal of Economic Studies*, vol. 7(1), pp. 84–92. DOI: <https://doi.org/10.30525/2256-0742/2021-7-1-84-92>
- Russell Stuart (2020). *Human Compatible: Artificial Intelligence and the Problem of Control* / translated from English by V. Zengan. Kyiv: Force Ukraine, 416 p.

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