УДК 330.1
JEL Classification: A1
DOI: https://doi.org/10.20535/2307-5651.30.2024.313030

Vovk Olha
Doctor of Economics, Professor,
Professor of the Department of Economic Cybernetics
(corresponding author)
ORCID ID: 0000-0002-1680-1959
National Technical University of Ukraine
"Igor Sikorsky Kyiv Polytechnic Institute"

Popova Liubov
PhD in Economics, Associate Professor at the
Department of Finance and Credit
ORCID ID: 0000-0001-7015-5567
Yuriy Fedkovych Chernivtsi National Uiversity

Вовк О. М.
Національний технічний університет України
«Київський політехнічний інститут імені Ігоря Сікорського»
Попова Л. В.
Чернівецький національний університет імені Юрія Федьковича

RESEARCH CONCEPTS IN DEFINITION OF THE DIGITAL ECONOMY

НАУКОВІ КОНЦЕПТИ У ДЕФІНІЦІЇ ПОНЯТТЯ «ЦИФРОВА ЕКОНОМІКА»

The subject of this study is the digital economy: theories and approaches to defining the concept. The article examines the definitions of the concept of "digital economy", conducts a terminological analysis of the concept and pays attention to the main practical aspects describing this phenomenon. It should be noted that there is a variety of approaches to the definition of the concept of "digital economy" in legislative documents, scientific research and practical activities. The author builds a logical scheme of interaction and interpenetration of processes arising in the course of creation of the digital economy, which allowed forming the author's vision of the essence of the definition for its further use in science and practice. The article also examines the main elements related to the conceptualisation of this concept, the aspects of the digital economy that distinguish it from the conventional economy, and focuses on the advantages of the digital economy.

Keywords: *digital economy, definitions, digital technologies, national economy, digitalization, elements of digital economy*

Предметом даного дослідження є цифрова економіка: теорії та підходи до визначення поняття. Цифрова економіка є важливою складовою розвитку національної економіки, що має вплив на трансформацію всіх сфер діяльності, зміна яких відбувається під впливом цифрових технологій. Застосування цифрової економіки в більшості країн сьогодні стало одним з пріоритетів економічного розвитку. Метою дослідження є розкриття дефініції поняття «цифрова економіка». Актуальність процесів трансформації національної економіки під впливом цифрових технологій на сучасному етапі розвитку економіки, важливість чіткого розуміння поняття «цифрова економіка» зумовили мету та предмет дослідження. Дослідження базується на загальнонауковій методології, яка передбачає системний підхід до вирішення проблем. Основою є фундаментальні праці вітчизняних та зарубіжних вчених з цифрової економіки. Досліджено значний спектр наукових концептів та підходів до дефініції поняття «цифрова економіка», які мають місце у законодавчих документах, наукових дослідженнях та практичній діяльності. Проведено термінологічний аналіз поняття та приділено увагу основним практичним аспектам, що описують дане явище. Вибудована логічна схема взаємодії та взаємопроникнення процесів, що виникають при створенні цифрової економіки, яка дозволила сформувати авторське бачення сутності дефініції для його подальшого використання у науці та практичній діяльності. Також досліджено основні елементи пов'язані з концептуалізацією даного поняття, аспекти цифрової економіки, що відрізняють її від звичайної економіки, акцентовано увагу на перевагах цифрової економіки. Узагальнення та систематизація накопиченого світового досвіду та вітчизняної практики реалізації цифрової економіки, розвиток теоретичних основ та понятійно-категоріального апарату, зокрема в уточненні низки дефініцій є важливим в економічній науці. Сьогодні цифрова економіка набула особливо прискореного розвитку після глобальної пандемії, орієнтована на зростаючу активність, що використовує високі інформаційні технології в усіх секторах ринку, є новим типом економічних відносин.

Ключові слова: *цифрова економіка, дефініції, цифрові технології, національна економіка, цифровізація, елементи цифрової економіки.*

Problem statement. The problem of the formation and development of the digital economy is extremely relevant both in theory and practice. After all, digital technologies are currently playing a crucial role in the development of the country. The development of science and economic thinking around the world, the use of digital technologies and artificial intelligence in economic processes have led to structural changes in economic relations. Globalisation processes are also deepening in the national economy. In the mid-1990s, Canadian financial expert Don Tapscott

said in his book The Digital Economy that the Internet and digital information could change business in the future. As we can see, today technology has changed not only the rules of doing business but also personal finance. Thus, it is important to develop the theoretical foundations and conceptual and categorical apparatus to clarify the definition of the "digital economy".

Analysis of recent research and publications. Researchers are currently studying various aspects of digitalisation at different levels of the economy. Today, considerable attention is paid to the study of the concept of 'digital economy' and its main elements [1-4].

The peculiarities of the transformation of economic systems and the new conditions of the digital economy are discussed in the works of the following scholars: Tulchynska S., Popelo O., Kholiavko N. [5]; Vovk O., Kostynyuk O. [6], Shkarlet S., Dubyna M. [7], Zhavoronok A., Cosmulese, C.G., Grosu [8]; Veretyuk S., Pilinsky V. [1], Kuznetsova A. [6], etc.

Formulating the purposes of the article. Generalisation and systematisation of the accumulated world experience and domestic practice of the definition of "digital economy", development of theoretical foundations and conceptual and categorical apparatus.

Presentation of the main research material. The concept of "digital economy" has long been part of the lexicon of lawyers, economists, experts and politicians. This term was first introduced by Professor Nicholas Negroponte (Massachusetts Institute of Technology, USA) [9], but there is still no clear definition, which is a significant obstacle to its conceptual justification. According to Jim Yong Kim, President of the World Bank Group, humanity is currently experiencing an information and communication revolution. The number of the poorest households with mobile phones is higher than the number of those with access to comfortable living conditions. At the moment, there is no single definition of the "digital economy". A number of scholars equate the concepts of "digital" and "electronic" economy, which is characterised by the maximum satisfaction of the needs of all market participants through the use of huge amounts of information and information technology.

According to the American economist and statistician Thomas Mesenburg, the digital economy is distinguished from the conventional economy by three components:

– e-business (the availability of various computer applications, online tools, and digital platforms through which business processes are carried out)

– infrastructure, which shows that enterprises have software, equipment, qualified specialists and other resources;

– e-commerce (sale of goods and services online).

In 2017. In their study "Defining, Conceptualising and Measuring the Digital Economy" [10], Ruman Bucht and Hicks Richard from the Institute for Global Development (UK) analysed the existing interpretations of the concept of "digital economy". The result of their analysis was the construction of a three-level model of the economy, including the digital sector, the digital economy, and the digitalised economy; the use of the concept of information and communication technologies (ICT). The researchers gave a fairly flexible definition of the digital economy, which includes possible future technological changes: "the digital economy is a part of the total output that is wholly or mainly produced on the basis of digital technologies by firms whose business model is based on digital products or services" [10].

The definition of 'digital economy' has also been addressed in the works of domestic scholars. Table 1 below summarises the definitions of the essence of the digital economy, authored by both domestic and foreign scholars.

It should be noted that according to the Concept for the Development of the Digital Economy and Society for 2018-2020, in the classical sense, the term 'digital economy' means an activity in which the main means (factors) of production are digital (electronic, virtual) data, both numerical and textual [18]. Analysing the definition of the digital economy (Table 1), a number of perspectives can be distinguished:

– The resource perspective (processing of data or information, as well as the use of human resources (knowledge, creativity, skills));

– process/flow perspective (use of technology to support specific business processes, such as transactions/commerce);

– Structural perspective (economic transformation, new web-based structures emerging as part of the digital economy);

– business model perspective (introduction of new business models (e-business, e-commerce, digital platforms).

Based on the above, it can be stated that the digital economy is the processes and methods of economic activity based on the use of digital technologies related to e-business and trade, which allow the sale of digital goods and services in cyberspace.

In other words, it is a system of transactions by means of electronic means of transmission, exchange and storage of information (fixed and mobile Internet) using electronic means of payment, cryptocurrency and digital currency. In the broadest sense, the digital economy is the creation of a networked, system-organised spatial structure of economic relations between business entities, which includes the sectors of creation and use of new information, digital technologies and digital products, telecommunications services, e-business, e-commerce (Internet commerce), electronic markets, remote transaction mechanisms, remote services, remote education and a number of other components.

Based on the definition of "digital economy", we can identify the following elements related to the conceptualisation of this concept

– goods: production of consumer goods such as computer equipment and digital telecommunications, capital goods, intermediate goods;

– software: development, production, marketing of packaged and customised software;

– infrastructure: development and operation of network infrastructure, additional network services.

– Services: professional services not covered by other categories, such as consulting, training and technical services

– Retail: The sale, resale and distribution of ICT goods, software and infrastructure and related services;

– Content: production and distribution of data content, including back-office processing and digitalisation.

It is worth noting that digital technologies are the basis for the digital economy. In its broadest, most general definition, the digital economy encompasses all economic activities related to digital means.

Table 1

Approaches to defining the concept of "digital economy"

Author	Definition
Veretiuk S.M., Pilinskyi V.V. [1]	The digital economy is part of an economy dominated by knowledge and intangible production.
Hrytsenko O.A.	The digital economy is defined as activities carried out in any real industry (industry, construction, agriculture, education, medicine, etc.) using new technological products.
Kit L.Z. [3]	The digital economy is the transformation of all areas of the economy through the transfer of information resources and knowledge to a computer platform for the purpose of their further use (including, where possible, on this platform).
Lane N. [4]	The digital economy is defined as the convergence of computing and communication technologies on the Internet and the flow of information, which is driving all e-commerce and huge organisational changes.
Kuznetsova A., Chmeruk H. [2]	The digital economy is defined as an economic activity that has emerged only thanks to the latest digital technologies and is based on the use of new digital business models, and in which the main means (factors) of production are digital (electronic, virtual) data, both numerical and textual.
Australia's Digital Economy: Future Directions, 2009 [11]	A global network of economic and social activities supported by platforms such as the Internet and mobile and sensor networks
Bukht R., Heeks R. [10]	The digital economy, however, we understand it more as the conduct of business transactions in markets that are located on the Internet.
Challenges for Competition Policy in a Digitised Economy [12]	A complex structure consisting of several levels/layers interconnected by an almost infinite and constantly growing number of nodes
Fayyaz S. A review on measuring digital trade & e-commerce as new economic statistics products [13].	Digital-based markets that facilitate trade in goods and services through online e-commerce
Deloitte. What is Digital Economy? 2019 [14]	A form of economic activity that arises from billions of examples of networked interactions between people, businesses and organisations, devices, data and processes.
Expert Group on Taxation of the Digital Economy. *European Commission* [15]	A digital-driven economy
ICT Innovation Vouchers Scheme for Regions. *European Commission*, 2018 [16]	The digital economy is a major source of growth. It will stimulate competition, investment and innovation, leading to better services, more choice for consumers, and new jobs
Oxford Living Dictionaries [17]	Digital economy – an economy that primarily operates with the use of digital technologies, especially electronic transactions that are carried out using the Internet

Source: compiled by the author

We believe that the digital economy will become more and more developed due to the rapid development of the Internet of Things, artificial intelligence (AI), virtual reality, blockchain technologies, self-driving cars and other technologies. Let us consider the main advantages of the digital economy:

– Information component. Consumers can get more information not only from manufacturing companies, but also from other companies and consumers in various forums to make decisions about goods and services;

– proximity. Direct customer service channels allow customers to resolve issues and problems with a manufacturer or service provider more quickly;

– global presence. The fact that goods and services are available to consumers at any time and in any place provides an opportunity to expand into more markets;

– Security component. Digital technologies provide a higher level of transaction security.

Today, the development of the digital economy is transforming a number of industrial sectors. Agriculture has already begun to benefit from technological innovation. Mobile apps are connecting crops with farmers, providing them with real-time updates on soil quality and irrigation to help them make management decisions.

The term "digital economy" was coined in the 1990s, when the internet was just a supplement to analogue products and services. At the time, the focus was on how new digital channels could affect consumers and businesses [15].

The differences between the traditional and digital economies are that technology and automation have replaced manual processes, digital services are gradually replacing traditional products and services, e-commerce is replacing traditional commerce, and non-cash payments are replacing cash.

The digital economy is multifaceted and constantly evolving. Based on the data collected about their customers and website visitors, companies can personalise experiences and recommend content, and integrate data into product planning and sales processes. Such strategies can help to obtain the information needed to re-engage customers.

Smartphones and the Internet make it possible not only to make purchases wherever and whenever you want, but also to track your health and fitness. By combining mobile connectivity with the Internet of Things, ordinary products such as refrigerators, vacuum cleaners and cars are becoming smart.

From chat-bots on websites to product suggestions based on previous purchases, automation saves companies time and money, and enables them to deliver exceptional customer experiences. Leading companies are using artificial intelligence to improve product discovery, demand and trend forecasting.

The digital economy is built on the ever-increasing interconnectedness between people, organisations and machines, which is the result of the development of the

Internet, mobile technologies and the Internet of Things. According to Visa, by 2026, when Generation Z fully matures, almost 60% of the world's adults will be born in a world where the Internet will be an integral, permanent feature of everyday life [19].

The rapid development of the digital economy is being driven by new technologies, including cloud and edge computing, the Internet of Things, artificial intelligence, and blockchain.

Companies participating in the digital economy can achieve great success through automation. Thanks to robotics and related technologies, businesses have the potential to increase productivity and create new, better products and services.

While the digital economy creates enormous new opportunities, its changing nature raises questions about cybersecurity, privacy, sustainability, economic inequality and the persistent digital divide.

As the digital economy thrives, companies are increasingly responsible for how they collect and use consumer data. Companies need to take additional measures to protect customer data, especially as cybersecurity threats are becoming more sophisticated. To avoid the serious consequences of such attacks, security needs to be built into digital platforms to deliver personalised experiences while complying with global security, privacy and governance standards.

Advanced security can give companies an edge in the digital economy, which is inherently competitive. In the traditional economy, consumer choice was limited by geography. Now, people can easily compare prices for their phones online or in stores.

The flip side of this new reality is that a small number of large enterprises can use their resources to dominate the market. With the right digital experience platform, it is possible to connect with customers faster and more accurately.

While the digital economy is promoting more sustainable practices, data centres and data networks account for 2% of global electricity demand, and data storage is expected to contribute 14% of global emissions by 2040. In addition, there is an excess of product waste [19].

More and more people are using smartphones, tablets, smartwatches and bracelets, as well as other mobile internet devices to connect to the global environment anytime and anywhere. Millions of people around the world can participate in the digital economy by buying or selling goods and services.

Conclusions. The digital economy refers to the use of information technology to create or adapt, market, or consume goods and services. Digital innovations include digital banking, e-commerce, virtual education, smartphone applications and collaboration platforms. Today, the digital economy is essentially any economic activity that takes place online. In other words, it is a data-driven economy based on the ability to collect, use and analyse vast amounts of information to provide more personalised and meaningful experiences. The digital economy allows companies to create new business models. The importance of developing the digital economy has led to a study of the definition of the concept of "digital economy", consideration of various approaches and interpretations.

References:

1. Veretyuk S. M., PIlInskiy V. V. (2016) Viznachennya prioritetnih napryamkiv rozvitku tsifrovoyi ekonomiki v Ukrayini [Determination of priority directions of development of digital economy in Ukraine]. *Naukovi zapiski Ukrayinskogo naukovo-doslidnogo Institutu zv'yazku – Scientific notes from the Ukrainian Telecommunication Research Institute*, no. 2 (42), pp. 51–58.

2. Kuznetsova A., Chmeruk H. (2019) Teoretychni pidkhody do vyznachennia tsyfrovoi ekonomiky [The toretical approaches to determining the digital economy]. *Problemy systemnoho pidkhodu v ekonomitsi – Problems of the systemic approach in the economy,* is. 6(74), pp. 34–41

3. Kit L. Z. (2014) Evolyutsiya merezhevoyi ekonomiki [Evolution of network economy]. *Visnik Hmelnitskogo natsionalnogo universitetu. Ekonomichni nauki – Bulletin of Khmelnitsky National University. Economic sciences,* no. 3, vol. 2, pp. 187–194.

4. Lane N. (1999) Advancing the digital economy into the 21st century. *Information Systems Fron-tiers*, no. 1(3), pp. 317–320.

5. Kholiavko N., Popelo O., Tulchynska S. (2021) Priority Directions of Increasing the Adaptivity of Universities to the Conditions of the Digital Economy. *Revista Tempos E Espaços Em Educação*, vol. 14, no. 33. DOI: https://doi.org/10.20952/revtee.v14i33.16383

6. Tulchynska S., Vovk O., Popelo O., Saloid S., Kostiunik O. (2021) Innovation and investment strategies to intensify the potential modernization and to increase the competitiveness of microeconomic systems. *IJCSNS International Journal of Computer Science and Network Security*, no. 21(6), pp. 161–168. DOI: https://doi.org/10.22937/IJCSNS.2021.21.6.22

7. Shkarlet S. M., Dubyna M. V. (2017) Essence and features of information society development. *Scientific bulletin of Polissia*, no. 1(2(10), pp. 152–158.

8. Cosmulese C. G., Grosu V., Hlaciuc E., & Zhavoronok A. (2019) The Influences of the Digital Revolution on the Educational System of the EU Countries. *Marketing and Management of Innovations*, no. 3, pp. 242–254. DOI: http://doi.org/10.21272/mmi.2019.3-18

9. Negroponte N. (1995) Being Digital. NY: Knopf, 256 p.

10. Defining, Conceptualising and Measuring the Digital Economy. (2017) *Development Informatics Working Paper*, no. 68. Available at: https://ssrn.com/abstract=3431732

11. Australia's Digital Economy: Future Directions. (2009). Available at: http://ict-industry-reports.com.au/wp-content/uploads/sites/4/2012/08/ 2009-Digital-Economy-Future-Directions-Snapshot-DBCDE-2009.pdf

12. Challenges for Competition Policy in a Digitised Economy. Available at: https://www.europarl.europa.eu/RegData/etudes/STUD/2015/542235/IP OL_STU(2015)542235_EN.pdf

13. Fayyaz S. (2018) A review on measuring digital trade & e-commerce as new economic statistics products. The 16th Conference of IAOS. Available at: https://www.oecd.org/iaos2018/programme/IAOS-OECD2018_Fayyaz.pdf

14. Deloitte. What is Digital Economy? (2019) Available at: https:// www2.deloitte.com/mt/en/pages/technology/articles/mt-what-is-digitaleconomy.html

15. Expert Group on Taxation of the Digital Economy. *European Commission*. (2014). Available at: https://ec.europa.eu/taxation_customs/sites/taxation/files/resources/documents/taxation/gen_info/good_governance_matters/digital/report_digital_economy.pdf

16. ICT Innovation Vouchers Scheme for Regions. *European Commission*, 2018 Available at: https://ec.europa.eu/information_society/newsroom/image/document/2019-32/member_states_use_of_voucher_schemes_0D31F683-AA92-B7FF-684433BCBD8A4F3A_61225.pdf

17. Oxford Living Dictionaries. Available at: https://en.oxforddictionaries.com/definition/digital_economy

18. The Concept for the Development of the Digital Economy and Society of Ukraine for 2018-2020. Available at: http://zakon3.rada.gov.ua/laws/show/67–2018-%D1%80

19. IMD World digital competitiveness ranking. Available at: https://imd.cld.bz/IMD-World-Digital-Competitiveness-Ranking

Стаття надійшла до редакції 12.09.2024
Стаття опублікована 09.10.2024