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Digital Economy as a Driver of Innovative Development

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ABSTRACT

The research reveals that theoretical foundations, stages, driving forces, efficiency factors of modern digitalization are considered as digital economy. The key components of the term "digital economy" are presented: digital technologies, ecosystems and transformations, taking into account their interconnection and interdependence, as well as continuity with the previously developed conceptual series - informatization, intellectualization and robotization. Also, the article presents a clear understanding of the object and subject of research, the importance of the essence of the digital economy phenomenon and the stages of its development. It is noted that the digital economy is an integral part of the information (digital) environment, forming in accordance with the needs of the real sector of the economy and the needs of society, changing under the influence of technological innovations.

Keywords: digitalization, digital technologies, digital economy, digital ecosystems, information and communication technologies, digital company.

1. INTRODUCTION

Nowadays, the term "digital economy" is widely used both in theory and in practice, according to well-known statements by Stan Kaplan in his methods of risk analysis, 50% of problems in the world arise from situations when the same words are used to denote different concepts, and the same amount appears because the same concepts are interpreted in different words [1]. The relevance of the problems of the formation of the digital economy is due to both the growth in the scale of social communications through social networks and the efficiency of digital platforms that increase the speed and variety of exchanges (through the use of technologies that built with using of signs of discreteness, programmability).

The father of the digital economy - Don Tapscott, the professor of St. Petersburg Polytechnic University - A.V. Babkin explore the features of digitalization of the economy from various points of view and refer, give a versatile, comprehensive definition of the digital economy: "a type of economy is characterized by active implementation and practical use of digital technologies for collecting, storing, processing, transforming and transmitting information in all spheres of human activity; the system of socio-economic and organizational-technical relations, based on the usage of digital information and telecommunication technologies; it is a complex organizational and technical system in the form of a set of various elements (technical, infrastructural, organizational, software, regulatory, legislative, etc.) with distributed interaction and mutual using by economic agents for exchanging knowledge in the conditions of permanent development" [2].

The digitalization of the economy can be defined as a modern innovative stage of economic development, which is based on the integration of physical and digital resources in the field of production and consumption, in the economy and society. It is characterized by new methods of

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generating, processing, storing, transmitting information in all spheres of human activity.

Returning to the term "digital economy", it should be noted that the directions, forms and types of activities associated with the use of ICT, digital technologies and the analysis of big data are developing so rapidly that even definitions cannot keep up with them. In this regard, both the clarification of the conceptual apparatus of digitalization and the assessment of its current state and prospects are relevant, which requires appropriate theoretical substantiation of this phenomenon. It should be pointed out to its two main aspects: digitalization and digital economy. The first is a long, complex and multifaceted process of transferring production, management technologies and information resources into a state suitable for the effective use of digital devices and technologies and involves achieving the following goals:

- Cheaper and more reliable collection, systematization, transmission and analysis data (due to discrete sensors - the Internet of Things, RFID tags, etc.);
- Cost reduction and simplification of communications in the economy and society (digitalization of content and communication channels);
- Creation of a system for multi-interaction of people and business processes vertically and horizontally (inter-organizational of digital systems)

Reaching a critical milestone, business process in digitalization (or the enterprise as a whole) leads to its qualitatively new state (transformation), characterized by a higher efficiency. In addition to information systems, it is necessary to introduce an appropriate "digital" culture in the company. This complex makes the company "digital", ensures its efficiency, productivity, business growth potential, then there are competitive points.

2. LITERATURE REVIEW

The concept of the "digital economy" is originated in the last decade of the 20th century. The introduction of this phrase, using this term in 1995 by Nicholas Negroponte from the University of Massachusetts. Over the past period in the scientific environment, there are many approaches to the disclosure of the term "digital economy".

So, M.L. Kaluzhsky defines the digital economy as the communication environment of economic activity on the Internet, as well as forms, methods, tools and results of its implementation [7]. The Digital Economy Outlook (OECD) regards this concept as a general term for describing markets that are focused on digital technologies and include, as a rule, trade in information goods and services through e-commerce [6]. In this case, digital technologies mean the Internet, mobile phones and all other means of collection, storage, analysis of information and exchange in digital form [1].

Thomas Mesenburg identified three main components of the digital economy [8]:

- e-business infrastructure (technical means, software products, telecommunications, networks, human capital, etc.);
- e-business (a way of doing business, any process is implemented by the organization with using information and communication networks);
- e-commerce (transfer of goods, for example, the on-line sale, on-line booking).

According to V. Katasonov, in the most general form, the digital economy can be present as the part of economic relations that is mediated Internet, cellular communication, ICT [9]. Digital technologies in modern the world create fundamentally new opportunities for building interaction between the state, business and the population, excluding long chains of

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intermediaries and speeding up various transactions and operations. For successful functioning business, in the digital economy there is not three elements or composite elements are passed by parts of infrastructure.

Based on this understanding of the digital economy, the authors in the many studies come to the conclusion that this model of the economy will provide "digital dividends" to society in the form of increasing access to markets and market coverage, growing domestic and market efficiency, including higher labor productivity, reducing transaction costs, employment growth (unemployment reduction), full satisfaction of human needs, productivity of working hours, poverty reduction and even weakening (or completely overcoming) the social polarization of society [1, 10,12].

3. RESEARCH METHODOLOGY

The main content of the functioning of the digital economy is a global network of economic and social activities that implemented through such platforms like the Internet, mobile and sensor networks. Digital economy tools - information and communication technologies (ICT), whose composition can be seen in Table 1. In 2017, the volume of sales in the global ICT market is valued at 4 trillion U.S dollars [10].

Table 1

Sales volumes in the global ICT market in 2017, billions of dollars		
1.	Computer equipment	368.7
2.	Telecommunication services	608.1
3.	Software	634.2
4.	Technical outsourcing and hardware maintenance	475.8
5.	Telecommunication equipment	331.8
6.	Technical consulting and services system integration	573.3

For the successful functioning of the business, three elements or components are required in the digital economy parts: infrastructure (Internet access, software, telecommunications), e-business (conducting business through computer networks), e-commerce (trade, distribution of goods through the Internet). We can say that they are electronic business technologies, internal driving forces. But the development of the digital economy directly depends from the introduction of such "external", are advanced science-intensive technologies as nanotechnology, biotechnology, technology of energy systems, quantum technologies, etc. Conversely, further development of ICT, including: cloud computing technologies, processing technologies, big data, mobile technologies, internet, technologies, geo-location technologies, technologies of distributed communication networks, gives impetus, the development of high technologies in the real "traditional" economy. Let us explain these new concepts.

CLOUD TECHNOLOGIES CALCULATION - provision of services: resource and infrastructure; the application development platforms; using the software for specific customer requests. The development of cloud services in the EU is determined by the strategy of the EU Digital Single Market, that is, the "European cloud", which should unite all digitized information

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and store in European databases for the purpose of ensuring access to it for all interested parties. Cloud creation secured by public and private investments, which are estimated at 6.7 billion Euros over 5 years.

TECHNOLOGIES OF LARGE DATA is not a very accurate name, it is used to indicate ways for processing "hypervolumes" of information, the characteristic of the digital economy. The expected growth in the digital economy volumes of digitized information, development of cloud technologies, requires the availability of modern Data Processing Centers (DPC), providing reliable storage of big data and the implementation of various clouds, including public, hybrid and private [2].
Data center is a key component of a unified technological infrastructure of e-government [9].

MOBILE TECHNOLOGIES - a segment of the digital economy based on the creation of cellular networks, meeting the needs of the cloud calculations for indicators such as data transfer rate, traffic volume, client network capacity, power consumption. In Uzbekistan, mobile technologies are implemented by telecom operators, they allow you to collect and process information (in a single data center), both for managing household appliances and for managing individual production facilities and entire enterprises. As a tool base, the Internet things can use, adapt or universal software and hardware complexes: for the automation of production processes in industry, agricultural production, telecommunications, household sphere of households [10].

E-LOCATION TECHNOLOGIES have opened up new opportunities for the provision of information services, with taking into account the location of the client (user), for example, satellite tracking services for transport and people: GPS, GLONASS. Using business application satellite tracking makes it possible to determine deviations from routes, unauthorized stops, misuse of transport, control of fuel consumption, etc. High precision autographic software products are used to
indoor use: airports, stadiums, train stations, etc. [2].

THE DISTRIBUTION TECHNOLOGIES, THE COMMUNICATION NETWORKS - the basis of the business model of the data center operation: the expansion of capacity and the creation of mega-data centers, are united in the distributed network that connected by channels with a large bandwidth. Due to economies of scale, maximum reliability is ensured, information safety, fault tolerance, high standards of service agreements and attractive cost of services.

ECOSYSTEM – unites Data centers, backbone network infrastructure, traffic exchange points, own import-independent cloud new platform [9]. The infrastructure digital economy – the elements of external digitalization cookies: managerial, legislative and regulatory acts, supplying organizations: energy sky, communication, educational points, housing and communal services enterprises, etc.

The efficiency of the transition to digital economy is determined by the available
and the ability to use tools, formation that created in one sphere for the life of people, in others spheres and industries. With this mind, the key, necessary condition is to provide compatibility of the elements of its ECOSYSTEM: the implementation platforms and services, applications, elements of electrical networks communication, software applications, provision. The solution to

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this problem is the result of the well-coordinated work of the entire IN- FRASTRUCTURES of the digital economy, the creation and the function of the state.

The digital economy is underdeveloped not only digitalization, but also society, business and government, therefore, its development consists in accelerating processes of penetration of digital relations at all levels of interaction, its participants - from state to personal.

4. ANALYSIS AND RESULT

There is a rapid development in digital technology in the past decade. The population with accessing to the Internet increased between 2005 and 2016 from 1 to 3.4 billion people, while covering more than 40% of the total population of the planet [13]. The number of households in developing countries, those who have a mobile phone are higher than those who have access to electricity or clean drinking water. Almost 70% of those in the bottom quintile of the population own mobile phones, while in high-income countries this figure is 98% [1].

Digitalization is changing the face and structure of the economy, breaking the usual business models, leading to the expansion of markets and opportunities, increasing competition and growing competitiveness, and both among individual business entities and entire countries. A striking example of this is the data provided in the Report.

McKinsey Global Institute, according to which, after 20 years of growth (from 1987 to 2007), the share of traditional flows of goods, services and finance in global GDP fell from 53% in 2007 to 39% in 2014, while the volume of cross-border data exchange in the period from 2005 to 2014 increased 45 times. In 2014, about 12% of world merchandise trade was carried out through international e-commerce, about 50% of world trade in services is already digitalized. That is why many experts agree that digital transformation is becoming one of the key drivers of global economic growth. So, according to one of the authoritative experts in the field of digital economy, The Boston Consulting Group (BCG), the share of the digital economy in the developed countries has grown since 2010 by 1.2 percentage points. In developing countries, this indicator increased from 3.6 to 4.9% (Table 2).

Table 2

Growth dynamics of the share of the digital economy in the different countries, G20,%

Country	2010	2016
Great Britain	8.3	12.4
The South Korea	7.3	8
China	5.5	6.9
European Union	3.8	5.7

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India	4.1	5.6
Japan 4.7 5.6	4.7	5.6
USA	4.7	5.4
Mexico	2.5	4.2
Saudi Arabia	2.2	3.8
Australia	3.3	3.7
Canada	3	3.6
Argentina	2	3.3
Russia	1.9	2.8
South Africa	1.9	2.5
Brazil	2.2	2.4

The high level of development of e-commerce in China is noteworthy. According to the same BCG company, in 2011 the turnover of e-commerce in the PRC was amounted to 18 billion US dollars, and at the end of 2016. Chinese consumers spent on purchases through the Internet is in the order of 750 billion US dollars, which is more than the figures for the United States and Great Britain combined. In general, according to the Ministry of Commerce of the PRC, the share of China in international e-commerce by the end of 2016 was 39.2% [15]. At the same time, according to the sectoral development program adopted in the country for 2016–2020, the volume e-commerce will grow in 5 years to 5.8 trillion. US dollars [16].

According to estimates of the McKinsey Global Institute [17], by 2025, digital technologies will drive China's GDP growth up to 22%, and Russia - up to 34%. The expected Value added by Digital Technologies in the United States by 2025 may amount to 1.6-2.2 trillion US dollars. These economic forecasts are predetermined not only by a high level of automation of existing processes, but also by the introduction of fundamentally new, breakthrough business models and technologies. Among them, digital platforms, digital ecosystems, in-depth analytics of big data, Industry 4.0 technologies (3D printing, robotization, Internet). According to the McKinsey Global Institute [17], the annual investment in the global economy of the Internet of Things will be from 4 to 11 trillion US dollars until 2025. Another trend in e-commerce is the increasing activity and role of small and medium-sized businesses in global trade.

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Digitalization has allowed the most active and entrepreneurial representatives of small and medium-sized businesses to transform into “micro-multinational” organizations, including by providing them accessing to the infrastructure of digital platforms that operate on the so-called ""onnect and play” principle; and unprecedented access to the platform’s built-in global customer base.

The most extensive databases of potential customers are contained in social media platforms. So, according to the calculations of the company Facebook [18], only for 2013–2017. the number of small and medium-sized businesses are registered on its platform increased by more than 2.5 times. The share of their foreign subscribers is about 30%. This fact characterizes social media platforms as a powerful marketing tool, especially for companies interested in exporting growth, indicators.

Meanwhile, e-commerce is an important for the component of the digital economy. In some countries, for example, electronic banking is relatively well developed. BCG specialists [14] in 2016 made an attempt to assess the level of development of digital economy, taking into account all its sectors. They expressed the results in indices that take into account many parameters (“BCG indices”). All countries were ranked in descending order of the BCG indices. Among the leaders

turned out to be: Denmark (1); Luxembourg (2); Sweden (3); South Korea (4); Netherlands (5); Norway (6); Great Britain (7). The lower levels of the rating were taken by the UAE (30); China (35); Russia (39); India (80th).

BCG specialists divide the diverse digital economies into 5 groups. The grouping criteria were the relative level of development of digital transactions and GDP per capita. BCG experts classify the countries with the highest percentage of “digitization” of economic transactions and the highest level of technologies that used for such “digitization” to the group of leaders. These are: South Korea, Denmark, Great Britain, Sweden, Norway and the Netherlands.

The second (main) group includes most of the countries with developed economies, in particular, Germany, the USA, Japan, and the countries of the European Union.

The third group covers countries with a high level of prosperity (GDP per capita), but with relatively lower rates of “digitization” of operations. These are the countries of the Middle East, primarily the UAE and Saudi Arabia. BCG experts emphasize that the number of countries of the third group, there are themes of the development of digital operations, which is why in the future they can rise to the second or even the first group.

The fourth group is represented by “emerging leaders”. In these countries, the level of development of digital operations is higher than the level of development of the economy. The most prominent representative of this group is China. All other countries are classified by BCG experts as lagging behind in the development of the digital economy.

In Uzbekistan, since the establishment of independence, special attention has been paid to the intensive development of information and communication technologies. The country is implementing large-scale digital infrastructure projects, including the development of public electronic services, the expansion of the electronic procurement system, the involvement of citizens in the process of making socially significant decisions.

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According to Internet Live Stats [19], in the terms of the number of Internet users, our country is currently ranked the first place in Central Asia, and the 37th place in Asia. As of 2016, the speed of access to international information networks reached almost 35 Gbps (at the end of 2015 - 26.4 Gbps), mobile communication covers 92% of the republic's settlements, the number of subscribers was 20.8 million people. At the same time, according to the Program for the Development of the Service Sector for 2016-2020, based on the active trend of growth in the number of users mobile communications, by 2020 this indicator is projected to reach 27 million people [20].

Nevertheless, despite the positive dynamics in development information technologies and communications, require their solution to the problem of their more active implementation in the economy. The rapid development in the world of digital technologies and the expansion of their role in the global economy, on the one hand, open up new opportunities and horizons for further development, and on the other hand, they give rise to serious challenges and threats for countries and companies that have not learned to live in a dynamic world of permanent innovation.

5. CONCLUSION AND RECOMMENDATION

One of the key trends in the global economy over the past decades is its rapid digitalization. Digital transformation is changing shape and structure of economies, breaking the usual business models, lead to the expansion of markets and opportunities, become the most important engine of world economic growth.

The results of the analysis allow us to believe that with the high degree of probability in the near future, the level of digitalization will determine the competitiveness of not only business, but also entire countries. At the same time, only those countries and companies can adapt most quickly and maximize the benefits of these changes.

To adopt successfully to change and reduce technological gap with the leading players, Uzbekistan needs to develop effective responses to the challenges of the digital age. In particular, the development of long-term evidence-based strategies is required. In this context, the outstripping pace of development should imply the gradual "catch-up" introduction of technologies of the previous generation. This approach will not only place the country and business in the position of perpetually lagging behind, but also lead to significant risks, since players with fundamentally new business models may enter the market. For advanced development, it is important to identify trends in the field of digital technologies that the most affect the appearance and structure of the economy as a whole and on individual industries, in particular, and also determine which of them will allow the greatest benefits over the next 5-10 years.

According to the Decree, the President of the Republic of Uzbekistan dated June 30, 2017 №UP-5099, today the necessary favorable conditions have been created in the country for this purpose. The development of sectoral programs for the modernization of the country's industry on the basis of the principles of "Industry 4.0" with the introduction of financial and non-financial mechanisms to stimulate demanding from enterprises for technologies. At the same time, it is important to motivate industrial enterprises to attract specifically domestic suppliers, engineering companies and research centers for the development and implementation of these technologies.

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Thus, the digital economy is a powerful innovation, growth and social well-being and its development in Uzbekistan is a requirement of the modern era. Deepening and expanding digitalization will increase the competitiveness of domestic economy in the world arena, to provide conditions for a gradual transition to the level of innovation economy and knowledge economy, as well as increasing the quality and standard of living of the population.

REFERENCES

1. Bukht R., Hicks R. Definition, concept and measurement of the digital economy // https://iorj.hse.ru/data/
2. Cisco. - Access mode: https://www.cisco.com/c/dam/m/ru_ru/internet-of-everything-ioe/iac/assets/pdfs/Cisco_Financial_ru.pdf. -Access date: 12.01.2019.
3. Digital dividends. Review [Electronic resource] / World Development Report. International Bank for Reconstruction and Development / World Bank. - 2016 .- 43 p. - Access mode: https://data.gov.ru/doklad-o-mirovom-razvitii-cifrovye-dividendy-2016-obzor-vsemirnogo-banka-2016-god. - Date of access: 26.11.2018.
4. Digital technologies // https://ru.wikipedia.org/wiki. Word Bank. World Development Report 2016: Digital Dividends / Word Bank Group, 2016
5. Digital Transformation Initiative. In collaboration with Accenture. Unlocking $ 100 Trillion for Business and Society from Digital Transformation. https://www.accenture.com/t20170116T084450__w__/usen/_acnmedia/Accenture/Conversion-Assets/WEF/PDF/Accenture-DTI-executive-summary.pdf
6. Efimushkin V. A. The concept of digital economy //https://bi.hse.ru/
7. Guzikova, L.A. Digital economy: in anticipation of dividends [Electronic resource] / L.A. Guzikova // Innovative clusters of the digital economy: drivers of development: works of scientific and practical. conf. with int. participation; ed. Dr. econ. sciences, prof. A.V. Babkina. - SPb .: Publishing house of Polytechnic. University, 2018 .-- 535 p. - Access mode: http://inecprom.spbstu.ru/files/inprom-2018/
8. Kalechits, D.L. Priority directions of digital transformation of the banking sector of the Republic of Belarus [Electronic resource]. - Access mode: https://www.nbrb.by/top/pdf/doklad-kalechits-10-2018.pdf. - Date of access: 08.01.2019.
9. Kaplan S. The Words of Risk Analysis // Risk Analysis. 1997. №17 (4). P. 407-417.
10. Katasonov V. Digital economy - the bright future of mankind or the stock market bubble? [Electronic resource]. - Access mode: http://www.kramola.info/vesti/novosti/cifrovaya-ekonomika-svetloe budushcheechelovechestva-ili-birzhevoy-puzyr (date accessed: 13.08.2017).
11. Kronk, J. Digital transformation of financial services - a reliable investment in the future [Electronic resource] / J. Kronk //Cisco. - Access mode: https://www.cisco.com/c/dam/m/ru_ru/internet-of-everything Access date: 12.01.2019.
12. Lenchuk, E.B. Formation of the digital economy in Russia: problems, risks, prospects / E.B. Lenchuk, G.A. Vlaskin // Bulletin of IE RAS. - 2018. –№ 5. - P. 9–21.
13. Naisbitt J., Eburdin P. What awaits us in the 90s. Megatrends. Year 2000. M., 1992.
14. Sagynbekova, A.S. Digital economy: concept, prospects, development trends in Russia / A.S. Sagynbekova // Theory, practice, innovation. - 2018. - №. 4. - P. 255–267
15. Smorodinskaya N.F. Complication of the organization of economic systems under conditions of nonlinear development. spkurdyumov.ru//uslozhnenieorganizacii-

ekonomicheskix-sistem.

16. Sokhanenko I.E// Innovation clusters of the digital economy: development drivers: works of scientific and practical. conf. with int.participation; ed. Dr. econ. Sciences, prof. A.V. Babkina. - SPb .: Publishing house of Polytechnic. University, 2018 .- 535 p. -Access mode: http: //inecprom.spbstu.ru/files/inprom-2018/inprom-2018.pdf. - Date of access: 28.11.2018.
17. Shkvarun, I. Where does digitalization begin? [Electronic resource]. - Access mode: http://delo.by/news/~shownews/schego-nachinaetca-cifrovizacia. - Date of access: 08.01.2019
18. Shumilin, A.G. Priority - innovative development / A.G. Shumilin // Belaruskaya Dumka. - 2018. - №. 11. - P. 3–12.
19. www.accenture.com/t20170116T084450__w__/usen/_acnmedia/Accenture/Conversion-Assets/WEF/PDF/Accenture-DTI-executive-summary.pdf
20. The number of Internet users has exceeded 13 million // [Electronic resource]. - Access mode: https://www.gazeta.uz/ru/2016/09/20/subscribers/ (date of access: 18.08.2017).