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**RESEARCH ON OPPORTUNITIES AND DEVELOPMENT
DRIVERS FOR THE DIGITAL ECONOMY**

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Abstract

In the modern world of scientific and technological progress, developed digital technology, expansion of country borders, and economic globalization contributed to informational explosion and transition from the third industrial revolution to the fourth one. The main resources of the world economy are information, knowledge (intellectual resource) and innovation. Information is transformed into a system of knowledge and skills, while relations in the socio-economic sphere are reoriented into the network space. Implementation of digital technology and tools of the digital (new) economy is a lever for innovative development of the economic environment.

The basic technologies of the digital economy are the Internet, artificial intelligence and mobile communication. Today, the digital economy is a priority area of the Strategy for Russia's Scientific and Technological Development. Innovation is the most promising lever of influence on long-term economic development of the Russian Federation, since the possibilities of other well-known tools are restricted by objective and subjective factors.

In the future, comprehensive digitalization of the Russian economy will form a platform for high-quality transformation and implementation of potential opportunities. The above listed factors and features determine the relevance of the study of opportunities and drivers for development of the digital economy. The study determines the level of digital economy development and institutionalization in Russia.

The article discusses the concept of digital economy and prerequisites for its development, analyzes the best practices of implementing programs for economic digitalization, digitalization development opportunities and trends.

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Keywords: Digital economy, drivers, innovations, strategy, national priorities.



1. Introduction

In developed countries, the level of economic innovation and digitalization is determined by new knowledge and high-tech product market capacity. Their share is more than 90% of the scientific potential of the global economy, and more than 80% of the global high-tech market.

At present, the concept of the digital economy is being successfully implemented in many countries, including Norway, Sweden, Denmark, South Korea, the USA, the United Kingdom and others. The innovative system and knowledge economy in developed countries are the basis for development of a digital economy model for developing countries. Russia is included in the list of countries with a high growth rate of the digitalization indicator, but with insufficient capacity and a low level of infrastructure development which lags far behind world rates (Naumkin, 2018).

Interest in the digital economy is due to the fact that modern foreign and domestic studies show the importance of information resources and digital technologies in world economic development. It was mentioned in the World Bank's World Development Report 2016: Digital Dividends (World Bank Report 2016). Mass use of digital technology provides society with digital dividends (an increase in the national welfare, profitability, transparency and openness of the public administration system). Digital technologies change the very model of economic activity, the relationship between the government and companies, increase the efficiency of invested funds and expenses, and provide new market opportunities (Sagynbekova, 2018).

The 2016 Message of the President of the Russian Federation to the Federal Assembly contributed to development and implementation of key elements of the digital economy. The President emphasized the need for updating a large-scale system program for economic development, the need for developing the digital economy. Transition of the Russian economy to innovative development, increasing competitiveness of the national economy sectors and foundation of innovative organizations and active use of technological platforms, organization of new high-tech enterprises on the basis of existing ones are enshrined in the Long-Term Socio-Economic Development Concept (Avdeeva, 2017). A program document "Digital Economy of the Russian Federation" (Order of the Government of the Russian Federation, 2017) was adopted. Its implementation is a turning point in the modern history of economic relations in Russia. The need for digitalization of the economy was actualized due to new economic realities, modern challenges and threats, among which transformation of human intelligence in coexistence with artificial, digital inequality of territories and humans should be highlighted.

Professor B. Panshin (Panshin, 2016) believes that an increasing economic digitalization zone is due to the growing transaction sector which includes public administration, consulting (information services), finance, trade and services (the share of the sector is 70 % of the GDP).

At the same time, the key aspect of implementation of digital economy elements is maintaining the optimal state of the system of information and economic security at various levels (government, enterprises, individuals) in the context of widespread digital space. In order to work for social well-being, innovative technologies must be safe and cost-effective.

Table 01. Key technological trends in economic sectors using digital technology

Industry	Key technological trends
Industry	Mass implementation of robotic technologies, intelligent (quantum) sensors in equipment and production lines; transition to innovative production with a minimum number of people employed; widespread automation of production cycles and their integration with management processes into a single information and analytical system; application of technologies for digital design and modeling of production processes and cycles; application of satellite communication technologies for monitoring, data collection, analysis, control, planning, forecasting and management of business processes
Energy industry	creation and implementation of intelligent electrical systems; increase in the production of high-intelligence products; development of new market relations by involving consumers into the energy market as active participants in sales transactions (sale of alternative energy)
Housing and utilities sector	Implementation of information and communication technologies, sensor systems for monitoring water and electricity consumption, network traffic systems and autonomous transportation options; an increase in the number of "smart cities", etc.
Agriculture	transition to a model of a circular (waste-free) economy and principles of sustainable development, farming using innovative intellectual technologies (including during making management decisions) and alternative energy sources; application of automated systems and robotics, new technologies for developing environmentally-friendly production
Electronic trade	leveling risks and difficulties of trading operations; creation of favorable conditions for national markets and improvement of the business climate
Communication	development of digital technologies and digital infrastructure, mobile communication systems; implementation of a new generation mobile network
Finance technology	creation of digital banks; financing digitalization; development of a cross-border financial services system

2. Problem Statement

The concept of digital economy was introduced into practical use by a Canadian entrepreneur, consultant and executive director of the Tapscott Group, Don Tapscott in 1994. In his book ‘Digital Economy’, a virtual business system was described. In his later publications, the author substantiates the need for transition to new business models (Tapscott, 1997) and proves that the growth of digital technologies contributes to transition to the next economic cycle (Tapscott, 1999). The basic principles of the digital economy were formulated by the founder of the Media Labs MIT Media Labs of the Massachusetts Institute of Technology N. Negroponte in 1995 (Neogronte, 1995). The third industrial revolution and transition period to the fourth one demanded scientific research on the “digital economy” phenomenon and related concepts, including digital technologies, information resources, technological breakthroughs, etc.

Dobrynin A.P., Chernykh K.Yu., Kupriyanovsky V.P., Kupriyanovsky P.V., Sinyagov S.A. (Dobrynin, 2016), Averyanov MA, Evtushenko S.N., Kochetkova E.Yu. (2016), Sagynbekova A.S. (Sagynbekova, 2018), Baller S., Dutta S., Lanvin B. (Baller, 2016), Brynjolfsson E., Kahin V. (2000), Dosi G. (1982), Babkin A V, Burkaltseva DD, Kosten D.G., Vorobyev Yu.N. (Babkin, 2017a) and others (Bisultanov, 2018) deal with the issues of economic digitalization. In particular, Brynjolfsson E. and Kahin B. define digital economy as “transformation of all economic sectors using computerized digitization of

information” (Brynjolfsson & Kahin, 2000). Babkin A.V. defines digital economy as “a set of social relations emerging through the use of electronic technologies, electronic infrastructure and services, technologies for analyzing large amounts of data in order to optimize production, distribution, exchange, consumption and increase the level of social and economic development of nations” (Babkin, et al, 2017b). Vap Gorp N. & Batura O. (Vap Gorp & Batura, 2015) define digital economy as “a complex multi-level structure whose elements are interconnected by an endless and ever-growing number of nodes”. The authors pay attention to a technological component of the “digital economy” phenomenon.

At the seminar of the World Bank in Russia which took place on December 20, 2016, the nature of the digital economy was characterized as a set of tasks to enhance economic development using digital technologies.

According to Dosi G. (1982), the procedures and nature of «technologies» are similar to those which characterize «science». In particular, there are «technological paradigms» (or research programs) performing similar roles.

R. Meshcheryakov (Meshcheryakov, 2011) believes that there are two definitions of the “digital economy”. According to the traditional approach, digital technology is applied in the e-commerce (telemedicine, distance learning, sale of media-content, etc.). According to the extended approach, the digital technology is used for economic production (Meshcheryakov, 2017). At the same time, there are technological and organizational gaps between the economies of different countries. This is due to the fact that the share of countries in the sectoral market is mainly determined by technological factors, while the cost advantages (disadvantages) do not play a significant role (Dosi, 2015). The government program “Digital Economy of the Russian Federation” (Order of the Government of the Russian Federation, 2017), approved on the basis of the Information Society Development Strategy for 2017-2030 (Order of the President of the Russian Federation, 2017) defines digital economy as a system “in which digital data are a key factor of production in all social and economic areas which increases country's competitiveness, living standards, contributes to economic growth and national sovereignty. ”

The digital economy in Russia is still developing. Its formation leads to global changes in all social areas. The study of world practice of digital economy development makes it possible to use and develop the existing innovative potential of the country, create conditions for economic growth and improve national well-being.

3. Research Questions

The article deals with opportunities for development of the digital economy in Russia and its advantages.

4. Purpose of the Study

The purpose of the article is to explore the nature and main components of modern digitalization, modern paradigm of development of the national economy using world's best practices of society digitalization; to identify opportunities and drivers for digital economy development in Russia.

5. Research Methods

Conclusions were made and results were obtained using the methods of empirical and theoretical knowledge, conceptual, logical and operational components. The methods of in-depth knowledge of reality (scientific abstraction), comparison, quantitative and qualitative analysis, systematization, and graphical interpretation were used.

6. Findings

The concept of digital economy can be defined as a form of organization of economic activity of society and socio-economic relations resulting from the scientific and technological progress by using technology of the sixth technological mode and ensuring long-term sustainable economic development.

The digital economy has a multi-level structure. All the levels are closely interacted due to active government regulation. Development of markets and sectors of the national economy is due to availability of high-quality digital platforms and technologies, modern innovation infrastructure. To this end, key institutions (educational environment, legal support, technological reserves) and infrastructure (information, security) are needed at every stage of digital economy development.

Currently, development of the digital economy in Russia is carried out in a step-by-step way. At the first stage (2017-2018), the concept of legal regulation of the digital economy is developed. At the second stage (2019-2020), legal infrastructure is created. At the third stage (2021-2024), the system of regulatory documents ensuring effective digitalization of society is developed.

Prerequisites for development of the digital economy in Russia are as follows: the significant potential of the national educational system, training of highly skilled creative professionals; availability of sufficient infrastructure for creation of the organizational and technological platform of the digital economy; effects of sanctions which slow down development of the digital economy due to a lack of Western innovation technologies and digital business models; synergy in the system of institutional and infrastructural support for digital economy development.

Among advantages of the digital economy are distance management, market and industry accessibility, simplification of calculations, electronic document management, an increase in labor productivity, cost reduction, a decrease in shadow economic activities, an increase in budget revenues due to transaction transparency, expansion of information opportunities for citizens, electronic control, creation of new jobs due to development of new markets.

Among disadvantages of the digital economy are security violation, violation of personal data confidentiality, clogging of the information space, a shortage of highly educated personnel, increasing unemployment.

At present, when the digital economy is actively and successfully developing around the world, Russia needs to implement digital technologies and tools in order to be competitive in the global market. There are two main concepts for development of the digital economy:

- a platform concept based on the digital platform. It assumes using a business model that provides business and people with specific services for synchronizing actions of market participants;
- a concept of the cyber-physical system which is a single complex of computing resources and physical processes.

According to Brynjolfsson E. & Kahin B. (Brynjolfsson & Kahin, 2000), Dosi G. (Dosi, 1982), Perez C. (Perez, 2010), target indicators of the digital economy are the share of e-commerce in the GDP and the level of digital economy in the GDP.

The percentage of the digital economy in the GDP of developed countries increased from 4,3% in 2010 to 5,5% in 2016. In the GDP of developing countries, this share is lower, but tends to increase from 3,6% to 4,9%. The UK is a world leader in digital economy with a GDP of 12,4%. The UK is a leader by the share of e-commerce in the GDP as well (13,5% of all purchases were made on the Internet in 2013, and 23% - in 2016). Active development of e-commerce is observed in China (5,5%), Japan, the USA (4,7%). In Russia, the Internet segment amounted to 1,9% of the GDP in 2010, and 2,8% - in 2016

According to the International Data Corporation, the global economy's expenses on developing and introducing digital technologies will increase by 16,8% every year. In 2019, they will amount to \$2,1 trillion. The forecasts of the consulting company Accenture are also quite optimistic: in 2020, the GDP of developed countries will increase by 1,8% and the GDP of developing countries will increase by 3,4% due to economy digitalization. Calculation carried out by The Boston Consulting Group shows that by 2035, the volume of the global digital economy will have been \$ 16 trillion rubles.

The developing digital economy is being implemented into all spheres: agriculture, education, medicine, and public administration. The main technological trends in digital transformation of enterprises are presented in Table 1. Development of these trends will help the industry adapt to requirements of the digital economy. At the same time, under stable progressive development, the digital economy needs new opportunities and development drivers (determining factors).

The main drivers of economy digitalization are new products, services, "subversive" technology, innovative business models, and reduced communication cost. In addition, in commerce, logistics and industry sectors, the concept of "Industry 4.0" and "smart factory" are a digitalization driver.

In Russia, the share of the digital economy in the GDP is 2,8% (approximately \$ 75 billion), much of which falls on the sphere of consumption as a form of virtual commerce. In 2016, the share of online commerce in all commercial areas was 3,2% (\$ 43 billion) (in 2010, it was 1,8% (\$ 12 billion)). About 80% of the e-commerce market in Russia is e-commerce of various goods (exportation of digital technologies is only about 1,2%). Despite positive results of digital economy development, Russia is far behind (the lag period is 5-8 years) leaders of economy digitalization. In the Russian economy, digital transformation should have a very positive effect on various industries. By 2025, due to the digital economy, the share of digital technologies in the GDP will have increased (up to 34%) (Avdeeva, 2017).

7. Conclusion

To conclude, the digital economy is a more sophisticated type of economic relations in all world industries. Development of the digital economy is hyperactive. High technology can become a key type of commodity-money exchanges in the world market. Trends and prospects for digitalization of the economy say that it is necessary to enter information and technological flows of innovation activities and apply them everywhere using potential opportunities.

The digital economy focuses on the consumer, place of sale and price. The latter has to correspond to the quality of the service provided. The global space is being transformed into a post-industrial society

for which information is a key resource. In this society, there are no restrictions on trade, and competitiveness is increasing. Russia is not among the countries leading in economy digitalization, but digital technologies are actively developing.

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