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DIGITAL TRANSFORMATION OF RUSSIAN ECONOMY: CHALLENGES, THREATS, PROSPECTS

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Abstract

Digital transformation is one of the main modern factors of economic growth. In this regard, the article examines the features of the digital transformation of the Russian economy. On the basis of the analysis of statistical data, assessment of: expenses of the organizations, households in the digital sphere and also shares of the public expenditures on digitalization in GDP is carried out, which allowed to determine the level of digitalization of domestic economy and degree of readiness of domestic economy for digital transformation. The article highlights the main directions of creating conditions contributing to the formation of the ecosystem of the digital economy of Russia. Digital transformation of business, digital transformation of the government and digital transformation of the labor market are considered as such conditions. The main threats arising from the digitalization of production are allocated and potential areas of organizations development are identified, due to the promotion of industry 4.0 into the economy, based on a multifactorial increase in the operating performance of companies. The paper identifies the key priorities of the transformation of public administration in the conditions of transition to digital government. The main threats and advantages formed as a result of introduction of digital technologies in the labor market are defined. On the basis of the conducted research the priority directions of development of the national digital economy are established.

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Keywords: Digital economy, digital transformation, level of digitalization, digital transformation.

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1. Introduction

As practice shows, in the modern world, the boom of digital technologies leads to improved interaction among different sectors of the economy in the electronic sphere, stimulates economic growth in all sectors of the economy, creates opportunities and increases the efficiency of services, as well as provides economic and social benefits for the population, enterprises and government agencies (Doucek, Fischer, & Novotny, 2017). Governments need to take structured actions to create, use and develop the advantages of the digital economy to ensure increased competitiveness both within the country and abroad, effective job creation, promotion of innovative approaches in the provision of services, diversification of the economy.

The Russian Federation is on the threshold of positioning itself as a new world leader in the digital economy. The digital transformation of the national economy has been announced as one of 12 new national projects of social and economic development of Russia, formulated by the President in May Decrees of 2018.

Today, the country has good opportunities and it needs to use the existing technological foundations, human resources, and the widespread use of information and communication technologies to ensure significant progress in the use of digital technologies to meet the development challenges. It is necessary to make maximum use of the opportunities of the digital revolution, to improve legislation that ensures the formation of competition among organizations, to promote the skills of workers in accordance with the requirements of the new economy and to ensure the accountability of institutions.

The digital economy is a multifaceted, dynamic and flexible concept having transformational ability thanks to digital technologies (Rozhkova, 2017). The term “digital economy” is defined as the electronic economy existing in a hybrid world. Hybrid world is the result of the merger of real and virtual worlds, characterized by the possibility of making all the “vital” actions in the real world through the virtual one. High efficiency, low cost of information and communication technologies and the availability of digital infrastructure are prerequisites for this process. The decree of the Russian President of May 9, 2017 No. 203 “About the Development strategy of information society in the Russian Federation for 2017 – 2030” contains official state definition of this phenomenon. The digital economy is defined as economic activity in which fundamental factors of production are digital data, processing of large volumes and use of analysis of results which in comparison with traditional forms of managing allow to increase significantly efficiency of different types of production, technologies, equipment, storage, sale, delivery of goods and services.

The “Digital Economy” direction is included in the list of the main directions of the strategic development of the Russian Federation until 2018 and for the period until 2025, as well as in the Strategy for the Development of the Information Society in the Russian Federation for 2017-2030. The understanding has been reached that a new view is needed on the model of the socio-economic development of the state in the conditions dictated by the global digital revolution (Betelin, 2018). Undoubtedly, the scale and plans of the state for digitalization are impressive. It should revive the Russian economy, reveal the potential of producers in the export direction, strengthen competitiveness in the global market, and also ensure innovative and high-tech production in the country.

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2. Problem Statement

The digital economy is able to provide high - quality information and communication infrastructure (ICT infrastructure) and mobilize its capabilities for the benefit of consumers, businesses and the state. Studies conducted recently indicate the relationship of the digital economy with all sectors of economic activity and confirm the fact that the digital economy can no longer be considered as part of economic activities, as it is not exclusively e-Commerce and e-business, and includes such activities as doing business, networking, providing services in all sectors, including transport, financial services, manufacturing, education, healthcare, agriculture, trade, media, entertainment and business using digital technologies. At the same time, the digital economy becomes the driving mechanism of inclusivity by means of ensuring communication between communities, exchange of information, ideas and products that allows countries to raise value added chains (Sagynbekova, 2018). Besides, it allows providing growth in all spheres of economy, reducing unemployment rate and costs of goods production, increasing labor productivity and barter, and satisfying clients' needs. Activity within digital economy could help in ensuring protection of consumers, respecting the rights for intellectual property, transparency and safety of cross-border Internet - trade, certificating and licensing of imported goods and services, ensuring cross-border payments, including the use of the National Payment Card System (NPCS).

Russia managed to create successful digital companies in the world due to traditionally strong knowledge and development in Cybernetics, software production, development of artificial intelligence systems. The country has all the resources necessary to become one of the leaders of the new technological system and development. Undoubtedly, it is impossible to solve all problems at once, so it is important to prioritize and focus on those industries and sectors in which the country is on a par with world leaders and has a reserve for them. It is important to ensure a harmonious environment with a decent education, a competitive environment, a variety of innovative ideas and competencies, as well as opportunities and resources. The legislation and activities of regulatory bodies should be adapted to the conditions and ideas of the digital economy, taking into account all economic and physical risks.

Digitalization of the economy and public life of citizens have already become crucial for maintenance of national interests, information sovereignty, technological independence and competitiveness of the Russian Federation in the world markets. In order not to afford a lag in the development of the digital economy and related innovative technologies, the national government should provide targeted support to high-tech and digital IT companies subsidize innovative development and innovations in the domestic virtual market, provide guarantees for state orders, tax incentives and other preferences to external and domestic investors (Gorelov & Korableva, 2017). It is important to understand that for the effective development of the digital economy, Russia needs a strong domestic IT industry capable of producing and maintaining high - tech products that can compete with foreign ones.

3. Research Questions

The domestic economy is at a stage of digital transformations. The phenomenon of rapid distribution of digital technologies – a digitalization and artifacts in the physical world – begins to define all directions of functioning of economy and society in general. In this connection it is necessary to formulate the following questions for this research:

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- to what extent is the domestic economy ready for changes in the field of digital transformation, what are the main threats associated with these changes?
- on the basis of international and Russian experience to determine the directions of development of the national digital economy.

4. Purpose of the Study

The purposes of this study are:

- To investigate degree of readiness of domestic economy for digital transformation and to reveal the main threats connected with digitalization of the Russian economy.
- To define the priority directions of development of national digital economy.

5. Research Methods

5.1.Hypothesis development

The formation of the ecosystem of the digital economy of the Russian Federation, in order to improve competitiveness in the global market, both individual sectors and the economy, in general, are determined by the creation of conditions in which data in digital form are the key factor of production in all spheres of socio-economic activity, are the basis for the transformation of health, education, industry, agriculture, construction, urban economy, transport and energy infrastructure, financial services and public administration through the introduction of digital technologies, platform solutions, the use of mainly domestic software by the authorities and local governments, as well as ensuring information security on the basis of domestic developments in the transmission, processing and storage of data.

5.1.1. Digital transformation of business

It should be noted that large-scale digitalization cannot be implemented in the absence of enterprises aspiration to change by means of technologies of the Industry 4.0 because of the need to survive in a competitive environment exposed to the effects of digitalization of the economy in general.

5.1.2. Digital transformation of the Government

For ensuring competitiveness of Russia in the long term the system of public administration, which will become technological, standard and cultural basis of future development, has to be created. The state in fact needs to be the guide for distribution of digital solutions for their mass use and should serve as a model of their implementation when rendering high-quality digital public services.

5.1.3. Digital transformation of the labor market

The digital transformation of the economy contributes to increased productivity, the emergence of new professions and jobs, and acceleration of job search process.

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5.2. Collection and analysis of data determining the development level of the digital economy in Russia

The data collection and analysis procedure is an integral part of any study. In this study, the data were obtained on the basis of statistical information from the IMF, Rosstat, IHS, MSK and other official sources.

6. Findings

In the report of the World Economic Forum on global competitiveness of 2016 - 2017 the importance of investments into innovations along with development of infrastructure, skills and the effective markets is emphasized. In the international rating Russia takes the 43rd place, at the same time considerably lagging behind quite large number of more competitive economies of the world (Schwab, 2016). According to the international index of network readiness for digital economy presented in the report "Global information technologies" for 2016 the Russian Federation takes the 41-st place and shows a significant gap from dozens of leading countries, such as Singapore, Finland, Sweden, Norway, the United States of America, the Netherlands, Switzerland, Great Britain, Luxembourg and Japan (Ackland, 2017). The significant lag in the development of the digital economy from the world leaders can be explained by the imperfection of the regulatory base for the digital economy and the lack of proper environment for business and innovation and, as a result, the low level of use of digital technologies by business representatives. The share of the digital economy in the country's GDP in 2017 amounted to 3.9%, which is two to three times lower than that of the leaders in this area. The volume of exports of digital technologies in the country is also four times less than imports (Table 01).

Table 01. Digital economy contribution to GDP, in % (compiled by McKinsey Global Institute)

Indicators	USA	China	EU countries	Czech Republic	Brazil	India	Russia
Share of the digital economy in GDP, including:	10.9	10.0	8.2	6.3	6.2	5.5	3.9
Household expenditure in the digital sphere	5.3	4.8	3.7	3.2	2.7	2.2	2.6
Companies ' investments in digitalization	5.0	1.8	3.9	2.7	3.6	2.0	2.2
Government expenditure on digitalization	1.3	0.4	1.0	0.6	0.8	0.5	0.5
ICT export	1.4	5.8	2.5	5.9	0.1	2.9	0.5
ICT import	-2.1	-2.7	02.9	-6.1	-1.0	-2.1	-1.8

It should be noted that according to the level of corporations' digitalization Russia lags behind the leading countries so far. The private sector does not take advantage of the active adoption of digital technologies by consumers, and invests little in the use of technological advances, productivity improvements and the creation of new products and services. The volume of investments of private companies in digitalization is only 2.2% of GDP (table.01), while in the US it reaches 5%, in Western Europe – 3.9%, in Brazil – 3.6%. According to the level of digitalization, the most important industries

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for Russia – mining, manufacturing and transport- lag behind the EU countries most. “Industry 4.0” technologies should change this situation.

Today, Russia is facing global economic challenges, including those caused by technological progress. In particular, the phenomenon of the fourth industrial revolution threatens the traditional foundations of the economies of many developing countries, including Russia. From the analysis of the results of scientific research conducted by the Chairman of the Davos economic forum K. Schwab, this phenomenon is caused by a new economic paradigm, in which capital from the natural form goes into the form of global unique information (Schwab, 2016). The desire of global companies to create and implement artificial intelligence in their strategic management system has already yielded intermediate results in the securities market, service and other areas of the economy. The so-called “block chain” technology, which appeared against the background of such progress, generated “crypto currencies” and a revolution in the sphere of transactions (smart contracts). This is a special incentive for the Russian economic formation.

The strategic task of the Russian Federation is to ensure the sovereignty of the country not only at the military-political, but also at the economic, social and technological levels. Until now, Russia is implementing a model of dependent development, and the structure of its economy is determined by the country's specialization in world trade.

Currently, our country is at the very end of the third industrial revolution, and in some sectors and industries - of the fourth industrial revolution. Internet and information technologies are used in all spheres of economy; the Internet of things is developing on the basis of artificial intelligence technologies. Economic entities have started practical use of 3D printers, additive technologies; robotics, creating new materials (composites and metamaterials); nanotechnology and biotechnology are introduced; new alternative energy sources are discovered.

Changes in the resources and technologies brought by the Industry 4.0 give new qualities in economic activity and the principles of its organization (Caruso, 2018). As a result of the development of platform solutions in various business sectors, horizontal and vertical communications of all processes both on private and corporate, and state and regional levels are strengthened. This makes it possible to transfer the achievements in the production of goods obtained in specific business structures into other sectors and territorial entities (Kitova & Bruskin, 2018). Platform decisions extend to design, production, and sale and become complex, breaking off model of branch division of production and forming the integrated hardware, software and service structures mastering through processes: from the order, design, production to sale and service (Budanov, Aseeva, & Zvonova, 2018).

Production digitalization - as a way of transition to the Industry 4.0, allows carrying out the interfaced changes at the industrial enterprises, in branches and sectors or in economy in general (Bachilo, 2018). Digitalization of management and economy - a task nation-wide. At the macroeconomic level (on the scale of the enterprises, branches and sectors) the Internet of things, the role Internet, big data, cloud computing, machine learning, 3D - the press, biometric identification, information modelling of objects are being mastered. At the macroeconomic level high-speed access, mobile calculations, a geolocation, automatic identification of objects, electronic implants, etc. are being mastered. Technologies that are capable of producing large-scale and qualitative changes in the entire socio-economic system include

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cyber-physical devices, artificial intelligence and prescriptive analytics. They will radically change the relationship between economic participants, affect property rights and means of production and, ultimately, lead to changes in the structure of society due to the fact that people will have to coexist with devices endowed with intelligence and the right to make decisions (Zimmermann, 2016).

The development of multimedia and multi-service platforms is carried out through the creation of client devices, digital content and services. So smart home is controlled by a system that regulates energy supply, lighting, media devices, security, heating, meters, and means of prevention and elimination of emergency situations. In automobile transport, platforms for navigation and transport management, tracking the status of electronic and electrical components of the car have been formed. There arise platforms for creating smart roads for smart cars.

The set of individual businesses, that develop and promote multimedia and multi-service platforms in their own market segment and at the same time penetrate into the others segments, forms an ecosystem of digital content and services of private and mass consumers. Abroad, such ecosystems are represented by Apple, Microsoft, Amazon, Alibaba, etc., and in our country - by “MegaFon”, Mail.ru, Sberbank, etc.

The implementation of smart platforms in the real sector of the economy is carried out at a time of fundamental changes in electronics, IT-infrastructure hardware, in the automobile and aircraft industries, aerospace industry, energy and other industries and sectors. Modernization of electronics and telecommunications equipment meets the needs of the Internet of things. The spread of smart TV, smart home devices, electric vehicles and drones, robots and aerospace devices uses the combined potential of the ecosystem's hardware, software and service businesses. Horizontal and vertical integration of these branches allows the producer to use achievements in other businesses and productions integrated into the common production, technological and administrative platform when all projects are crossed technologically: alternative power engineering, accumulators, electric vehicles, electro-and robotics, etc. At the same time robotics and telecommunications become a necessary component of development the Internet of things and information technologies.

Platform solutions cover all stages of value creation: research and development, product design, hardware and software-service solutions, forming a single system up to the distribution and customer service of the final product. Cooperation and integration of economic structures serves as the base for the formation of platforms on the basis of which ecosystems covering a whole set of industries or territorial entities are created.

The purpose of information technology is to transform the growth of efficiency and productivity in a self-supporting process that has been implemented in the creation of the Internet of things (IOT), that is, the system integrates computer networks and connected to them physical objects (things), through built-in sensors and software for data collection and exchange. Such a system is controlled in an automated mode, including remotely from the point of localization of things without participation of the person.

According to some experts, most Russian companies are not ready for the digital economy. The index of readiness for the transition to digital technologies amounted to 36 points out of 100 possible. According to the conclusions of the experts of the Analytical center of NAFR (National Agency for Financial Research) and the Skolkovo Foundation, expressed in the framework of the joint research dated for the start of the Moscow international forum, a significant risk area is the lack of training of employees

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for the transition to digital technologies, the low level of use of channels of transmission and storage of information, as well as the opportunities of the Internet to promote their own business (How to understand digital transformation?, 2017).

In addition, one of the main limitations of the development of domestic innovative companies is the lack of investment resources. And if the volume of public funding for research and development (R & D) in Russia corresponds to the level of developed countries, amounting to 0.4% of GDP, with the involvement of private investors, things are worse. The share of private funding for research and development is only 0.7% of Russian GDP, which is significantly less than in the US (1.9%) or Germany (2.0%) (Ackland, 2017).

One of key priorities in transformation of public administration is digitalization (Akatkin & Yasinovsky, 2018). The current state of system of public administration in Russia does not meet the latest challenges. The state needs to create conditions which will help the person to disclose the abilities and create comfortable and safe environment for his life and realization of potential and also for formation and introduction of digital technologies.

Assessment of the digitalization index allows us to conclude that the level of development of digital public services in Russia does not much concede to the average values of the leading digital countries. In Russia, the share of government spending on ICT in GDP is comparable to that of India, China and Central Europe, but is on average twice lower, than in the USA, Western Europe and Brazil. Similarly, share of IT costs in the country's consolidated budget remained virtually unchanged between 2012 and 2015, at 0.6-0.7% of GDP, which is significantly lower than that of the leading countries (for example, the USA - 2.2% of GDP).

One of the few significant improvements is the improvement of the quality of public services through the creation of a system of multifunctional centers and a Single Portal of Public Services. At the same time, the number of users of the platform of state and municipal services doubled in 2016 and reached 40 million people, which is equivalent to a half of active Internet users in Russia.

Digitalization of the Russian economy results in need of adaptation of employees and employers to new conditions. The widespread digitalization of business models and entire industries in the coming decades will lead to a partial substitution of human labor with machine labor and the release of a significant share of the labor force, which will create new difficulties for organizations and the state (Drahokoupil & Jepsen, 2017). However, it should be noted that digital technologies and platforms can also have a positive impact on the labor market: they will facilitate the search for personnel, reduce the time of job search, increase employee productivity, enhance the involvement of personnel in the economy with the help of distant jobs and provide access to high quality education.

In process of further digital transformation of the economy, automation and robotics, increasing productivity and replacement physical service channels with digital ones, more jobs can appear under the threat of disappearance. According to McKinsey Global Institute by 2036 from 2 to 50% of the work expressed in man-hours can be automated, and by 2066 this share can reach from 46 to 99% (McKinsey Global Institute, 2018).

It should be noted that the share of employees whose functions are primarily related to the development and use of digital technologies is about 2% of the total employed population of Russia. It

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corresponds to the overall low share of the digital economy in the structure of Russia's GDP and is twice less than in the countries – digital leaders. Russia also concedes to the leading countries in terms of employment in high-tech and knowledge-intensive industries. This indicator in Russia is estimated at 5.5%, while in Germany, which is one of the leaders in the field of modern high-tech industries, it is close to 10%. According to the group of indicators, the Russian education system lags far behind the countries-digital leaders, which can lead to the formation of risks of shortage of digital personnel in future.

At the same time, new digital technologies have a number of features that have a positive impact on the labor market (Gorelov & Korableva, 2017). In particular, the use of modern digital job search portals allows candidates to improve career opportunities thanks to access to extensive database of relevant vacancies. Digital platforms help to increase productivity as they provide a more accurate match to the job applicant's profile. In addition, they can reduce unemployment, as well as reduce shadow employment and job search time. The introduction of modern digital tools in all spheres of life contributes to the emergence of new professions and jobs that did not exist before. Thanks to modern technologies, it is possible to work distantly, which allows to increase employment efficiency of specialists from regions where local demand for them is limited. In addition, digital technologies help employees to acquire new knowledge and skills through distance e-learning to improve their own skills or to learn new professions.

Another important component in the creation and development of an effective digital economy in Russia is its cyber security (Lopatin, 2018). The number of digital threats and the complexity of their identification will increase every year, and therefore the state should introduce new ways of protection and develop regulatory infrastructure that meets all modern requirements.

7. Conclusion

According to the experts the potential of domestic digital economy will increase the country's GDP by 4.1-8.9 trillion rubles by 2025. The subsequent development of digitalization will allow providing from 19 to 34% of Russia's GDP growth, and the share of digital economy will make 8–10% in GDP. The forecasts of the Ministry of economic development for the period from 2017 to 2020 are more conservative and range from 1,6% (basic) to 2,3% (target) of GDP growth (Analytical statement, 2017b).

Certainly, digital transformation of the Russian economy will have an increasing impact on different industries. As the main drivers of the long-term economic growth based on strengthening of process of digitalization it should be noted the multiple-factor increase in operational productivity of companies due to promotion of Industry 4.0 in the economy, optimization of production and logistic operations, increase in efficiency of research and development and use of resources by means of installation of advanced IT systems. However enormous work on adoption of new standards and regulations for buildings and constructions design, motor transport, air and sea vessels, industrial equipment, transport infrastructure, etc. is necessary for product and production innovations. New standards are also required for the processes of identification and personalization on the Internet.

As the distinguishing features of the digital transformation of public administration it is necessary to note the organization of the transition to a digital government based on meeting the expectations of the "digital generation" through the expansion of the scope of social innovation and introduction of new digital technologies of the intellectual data analysis, storage and processing of big data, deep learning,

block chain and others. To do this, it is necessary to transfer the rule-making onto a digital basis and the development of a regulatory framework relevant to the objectives of the digital government, based on the principles of unification, structuring, algorithmization and harmonization. According to conclusions of the report of the consulting company The Boston Consulting Group (BCG) digitalization of public services only for business in Russia by 2019 will allow to reach economic effect of 5. 7 trillion rubles (Analytical statement, 2017a).

One of the directions of development of digitalization of the economy is to improve the efficiency of the labor market. However, in order to level the threats caused by the strengthening of the transformation of the domestic economy, for further successful development, the system of education and retraining must ensure the provision of specialists that meet the requirements of the digital economy.

We can say for sure that strengthening of digital transformation will lead to the fact that in the near future there will not be the usual industry division inherent in the modern economic structure, and we will witness the emergence of fundamentally new industries, with a different scale, life cycle and industry management. These changes will affect not only industries themselves, but also will change shape and structure of economies of all countries. Therefore, each country and Russia in particular have to pay special attention to development of own digital economy, because this is the only way for our country to become really competitive power and to get necessary competitive advantages.

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