Trends of the digital economy development in Russia

Maria Romanyuk¹*, Maria Sukharnikova¹ and Natalia Chekmareva¹

¹PhD, Ass. Prof. of Management Department of the Russian State Agrarian University – MTAA named after K.A. Timiryazev, 49 Timiryazevskaya street, 127550, Moscow, Russian Federation

E-mail: ma.romanyuk@yandex.ru

Abstract. The article describes the objective prerequisites for the development of digitalization of the Russian economy. The characteristic of foreign and domestic approaches to theoretical and methodological generalization of digitalization processes is given. The article substantiates the current position of Russia in international ICT development ratings, the country’s share in the world market of ICT goods and services, and the degree of dependence on their imports. The analysis of the development of the state policy of Russia in the field of ICT was carried out, strategic goals, priorities and targets for the development of the digital society in Russia until 2030 were named. Analysis of the dynamics of ICT development showed that currently there is a positive trend only for one of the three goals of the National Program “Digital economy of the Russian Federation”, aimed at creating an information and telecommunications infrastructure. The strategic analysis of the Russian economy showed that with high rates of digitalization of social infrastructure and public administration, the contribution of ICT industries to the country’s GDP does not increase. So, according to the Strategy of development of the information society in the Russian Federation until 2030, the state directly regulates the direction of development of information infrastructure, while the introduction of digital technologies in the real sector of the economy is a matter of business initiatives.

1. Introduction

Since the late 1990s, information technologies have been actively included in the socio-economic life of society. And now, along with nano- and biotechnologies, they are becoming the technological basis of the fourth industrial revolution. In addition, the modern digitalization of socio-economic and technological processes is a manifestation of the objective laws of globalization of the world community. Information innovations, which occur with incredible speed, form different types of relationships and interactions between society and the state, change market models of behavior and transform a person’s personality. In the changing conditions technological patterns, different models of socio-economic development of the country are formed, where specific technologies acquire new functions – they become capital, a resource and a tool for managing society.

On the one hand, any state is a participant of the global processes of digitalization, and on the other hand, a subject of management of the development of information and communication technologies (ICT) within the country. Therefore, the issue of substantiation of trends and strategic directions of information technology development in Russia is of particular relevance. It is obvious that in the long term, information technologies will become the driver of the socio-economic development of the world and our country. In this regard, a strategic vision is needed at the state level regarding the forms and extent of ICT participation in the real economy and in the social sphere. In our point of view, the...
digital economy is the most important condition for the formation of new economic models of interaction between the state and market participants. It is obvious that under the current economic model, the widespread introduction of information innovations in the production process of various industries will lead, on the one hand, to a sharp increase in labor productivity, but also to the release of labor resources, due to automation and robotics, until the disappearance of many professions, on the other hand. A sharp increase in the gross value added of products of many industries in the short term will be accompanied by an increase in unemployment and social tension in the long term. Therefore, the ICT development is a matter of strategic importance and complex system settings of socio-economic development of the country.

The purpose of the article is to substantiate the current trends in the development of information technologies in Russia.

2. Literature references
The theoretical foundations of the digital society and the digital economy are at a stage of development, and there are currently many interpretations of the main categories, as well as the lack of a unified methodological framework for statistics and analysis of the dynamics of ICT development. In our opinion, this is due to the fact that since the middle of the twentieth century these processes have been carried out in parallel to each other with different goals, conditions and principles in Russia and other countries. The Western approach to systematization and analysis of categorical or conceptual apparatus in this area, used since the 90s of the last century, was presented in the R. Bucht and R. Hicks’s research [1]. The essence of their research is to identify approaches to analyzing categories of the digital economy: resource-oriented, procedural (flow-based), structural, and business-oriented. The development of the approach is reflected in the research of M. Skilton (2010s), who considers the digital economy as an element of the digital ecosystem [2]. The development of the national theory of digital economy is described in the works of national scientists A.V. Petrikov [3], S.B. Ognivtsev [4], A.A. Volkov [5], T.N. Yudina [6] and others. In particular, S.B. Ognivtsev notes that in Russia before the beginning of the 2000s, the authors referred to digitalization or digital transformation as automation of management, including process control based on digital technologies [4]. Currently, the concepts of digitalization use broader interpretations, from the transformation of information into digital form to the digital transformation of production, business, science, and the entire civil society.

Since 2000s, a unified theoretical and methodological basis of ICT development at international level has been formed: during the World summits a number of international instruments that define basic directions of development of digital society and digital economy have been adopted (Okinawa Charter 2000, Declaration of Geneva 2003, Tunis commitment 2005).

The main document defining the country’s development in the field of information and communication technologies is the Strategy for the Development of the Information Society in the Russian Federation for 2017 - 2030 (hereinafter – the Strategy). It is based on six principles that are consistent with the fundamental international documents [7].

The Strategy clearly defines the conceptual framework. It seems logical to distinguish three main groups of categories:

I group – basic categories, the main ones: knowledge society, digital economy;

II group – digital technologies (digital space): secure software and service; Internet of things, cloud computing, big data processing, next-generation communication networks, technologically independent software and service;

III group – digital environment (digital society): industrial Internet, e-government infrastructure, critical information infrastructure, national electronic library, critical information infrastructure facilities, cloud computing.

3. Materials and methods
The theoretical and methodological basis of the research is historical, dialectical, abstract-logical and other general scientific and private methods of cognition, the principle of consistency, factor, com-
parative and strategic analysis, empirical generalization, tabular, matrix and graphical methods of visualization of statistical and computational data.

The information basis of the research was international documents in the field of development of digital society, the official data of Federal State Statistics Service; Strategy of Information Society Development in Russia to 2017 - 2030, Federal state programs, National projects; the Ministry of Economic Development, Ministry for Digital Development, Communications and Mass Communications of the Russian Federation; data on the implementation of strategies of socio-economic development; publications in scientific journals on the research topic.

The study uses such international indicators for evaluating the development of the digital economy as the ICT development index (IDI), the E-government Development Index (EGDI), the International Digital Economy and Society Index (I-DESI) [8], and the Global Cybersecurity Index (GGI) [9].

To achieve this goal, the authors analyzed Russian and international approaches to the formation of conceptual apparatus and methodological tools for the ICT development; studied the legal framework of digital technologies in Russia and justified the strategic guidelines for their development; analyzed the dynamics of ICT development in Russia, as well as the place and level of development of national ICT, relative to other countries. Thus, the combination of the used materials and research methods allowed substantiating the trends in the development of information technologies in Russia.

4. Results

1. Analysis of the dynamics of international indices (ICT Development Index, E-government Development Index, Global Cybersecurity Index, International Digital Economy and Society Index) shows that Russia is in the top third of countries (out of 176) in terms of digital technology development. This indicates a confident development of digital technologies. However, its place in the rating is gradually decreasing. In other words, a number of leading countries in the rating (Denmark, the Republic of Korea, and the United Kingdom are the undisputed leaders in the aggregate of indices) are characterized by outpacing the growth of ICT and the development of the digital economy. Despite the absolute growth of the ICT development index from 6.48 in 2012 to 7.07 in 2017, Russia fell from 41st place in 2012 to 45th place in 2017 (figure 1a). A positive trend is observed in the E-government Development Index: its absolute value in 2018 is approaching the maximum and is 0.8, and its position in the international rating has significantly increased since the beginning of observations (figure 1b).

Figure 1. Russia’s place in international rankings.
2. The dynamics of ICT development as a branch of the Russian economy is not characterized by significant outpacing growth. Analysis of indicators reflecting the main trends in the development of the ICT industry shows that the gross value added of the industry is constantly growing (on average, over the past 5 years, the growth rate was 8%), but its share in GDP remains almost unchanged. The share of people employed in the ICT industry remains unchanged at 1.7% (table 1).

Russia continues to be an importer of ICT-related goods and services. The total volume of information technology imports to Russia in monetary terms is 4 times more than exports. Recognized leaders in the global ICT market are China (30.7%) and Hong Kong (14.6%). Ireland (16.1%) and India (10.4%) lead the market for ICT-related services. Russia occupies only about 1% of the global market for ICT-related goods and services. In general, our country is dependent on imports of information products and technologies, mainly computers, communication equipment, consumer electronic equipment and software.

Table 1. Key indicators of the ICT sector development in Russia.

| Indicators                                | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|-------------------------------------------|------|------|------|------|------|------|------|------|------|
| Share of ICT in GDP, %                    | …    | 2.2  | 2.3  | 2.3  | 2.2  | 2.3  | 2.3  | 2.3  | 2.2  |
| Share of people employed in the ICT industry, % | 1.7  | 1.7  | 1.7  | 1.7  | 1.7  | 1.7  | 1.7  | 1.6  |
| Expenditures on information and communication technologies, billion rubles | 515.6 | 603.0 | 842.7 | 1245.7 | 1174.9 | 1153.1 | 1249.2 | 1487.6 | 1676.2 |
| Exports of ICT goods and services, $ million | 3 658 | 4 570 | 5 134 | 6 360 | 8 458 | 6 739 | 5 494 | 6 859 | 7 366 |
| Volume of imports of ICT goods and services, $ million | 23 475 | 26 871 | 28 639 | 27 444 | 29 241 | 22 003 | 21 401 | 26 159 | 29 087 |

Sources: made by the authors based on materials: http://www.gks.ru/free_doc/new_site/business/it/monitor_rf.xls (as of 25.04.2020)

3. Since the 2000s, the development of information technologies has been a priority area of state policy in Russia. In 2002, for the first time, the Federal target program “Electronic Russia” for the period 2002-2010 was adopted, the priority goals of which were formulated as expanding citizens’ access to information services. In the State program for the next period – “Information society” for the period 2011-2020, the goals are aimed at the development of digital technologies and improving the efficiency of public administration.

The instruments of state support for the development of information technologies that were in effect until 2018 can be grouped into two groups. The first category includes support measures that provide access to digital technologies: procurement of ready-made information technologies (e-government, public services, educational platforms, etc.), development of information infrastructure, and provision of broadband Internet access. The second group includes measures of direct financial support for the development and implementation of information technologies in the framework of scientific, technical and innovation policy of the state.

Since 2017, with the adoption of the Strategy for the Development of the Information Society in the Russian Federation until 2030, the tactical nature of the targets of implemented programs aimed at solving priority problems is changing to a long-term strategic focus. The main goal of the Strategy is to create conditions for the formation of a knowledge society in Russia.

4. The Strategy implementation mechanism is based on the principles of project management. The national program “Digital economy of the Russian Federation” (hereinafter referred to as the Program) is the first stage of project management within the Strategy. The three main goals of the Program specify the priorities of the Strategy for the medium-term until 2024, and are detailed in the targets [10].
The first goal of the Program is to increase national spending on the development of the digital economy from all sources (as a share of the country’s gross domestic product) by at least three times compared to 2017. At the moment, there are no growth trends in this indicator, and the planned level of 2018 has not been reached.

The second goal is to create a stable and secure information and telecommunications infrastructure for high-speed transmission, processing and storage of large amounts of data, accessible to all organizations and households. Analysis of data dynamics showed that Internet access for both households and organizations is steadily growing. For example, if in 2013 only 56.5% of households had broadband Internet access, in 2018 their share was 73.2% (but the target for 2018 was set at 75%, i.e. there is a lag behind the planned growth rate). The share of organizations using broadband Internet access increased from 79.4% in 2013 to 86.5% in 2018.

The third goal is to use primarily domestic software by government agencies, local governments, and organizations. As noted above, at the moment there is still a dependence on imported software. At the same time, the implementation of previous State programs has affected the development of information literacy of the population and the availability of digital technologies, including in organizations, which has led to an increase in the share of state and municipal services received in electronic form – in 2018, this indicator is quite high (74.8%), which indicates a high digitalization of the public sector. It should be noted that in 2013 this indicator was only 30.8%, and the growth rate is significant.

5. In order to study the contribution of information and communication technologies to the development of the Russian economy, an analysis of the level of digitalization of industries was made (according to 2018 data). The results of the analysis are presented in the form of a map of strategic positions of industries (figure 2), which is based on two criteria: the share of gross value added of the industry in the formation of GDP and the share of industry organizations using ICT in the total number of organizations. Each of the criteria is divided into three levels of values: low, medium, and high. In addition, all sectors of the economy are grouped into four groups: the business sector, financial and insurance activities, social sphere and public administration.

The largest group – the business sector of the economy - forms the main share of Russia’s GDP and has different levels of digitalization: only profitable high-tech industries of production and trade have a high level of ICT implementation.

Sectors of the social sphere group (education, health, culture), as well as public administration do not form a significant share of the country’s GDP, but have a high level of involvement in ICT. Thus, the development of the digital society and economy regulated by the state directly in the fields of public administration and social sectors through the Strategy of Information Society Development in Russia until 2030 and the National program “Digital economy”; and indirectly in the industries of the business sector activities through the Industrial Development Strategy of the Russian Federation up to 2030 and Forecast of scientific and technological development of the Russian Federation until 2030.
5. Summary
The process of digitalization of socio-economic and technological processes is a manifestation of objective patterns of development of the world economy.

Currently, the theoretical and methodological generalization of digitalization processes is not completed in the scientific environment, so, due to different scientific approaches, there are problems of inconsistencies in the conceptual apparatus and there are no unified methodological bases for statistics and analysis of the dynamics of ICT development in countries.

Over the past 20 years, the goals of Russia’s state policy in the field of ICT have evolved from the tactical level - expanding citizens’ access to information services, to the strategic level - the formation of a knowledge society. Currently, the main goal oriented document in the field of ICT is the Strategy of Information Society Development in Russia for 2017 - 2030, which clearly defines the main categories, priorities and tasks of development, identifies key indicators, and also based on principles consistent with fundamental international documents.

Analysis of international ratings and the dynamics of ICT development in Russia showed that our country is in the top third of economically developed countries in terms of digital technology development, but has an extremely low share - about 1% - in the world market of ICT goods and services and depends on their imports.

Analysis of the implementation of the Strategy for the Development of the Information Society in the Russian Federation until 2030 and the National program “Digital economy of the Russian Federation” for the period up to 2024 showed that currently there is a positive trend for only one of the three goals, aimed at creating information and telecommunications infrastructure. There is no positive dynamics in the target indicators related to the increase in internal costs for the development of the digital economy and import substitution of software in public administration.
Analysis of the contribution of information and communication technologies to the development of the economy showed that the development and implementation of digital technologies in the real sector of the economy is a matter of entrepreneurial initiatives and responsibility in matters of investment and technological innovation. Industry groups in the social sphere (education, health, culture) and the state administration are regulated by the government directly as part of the Strategy of Information Society Development in Russia until 2030 and the National program “Digital economy of the Russian Federation”. With high rates of digitalization of social infrastructure and public administration, the contribution of ICT industries to the country’s GDP does not increase.

6. References

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