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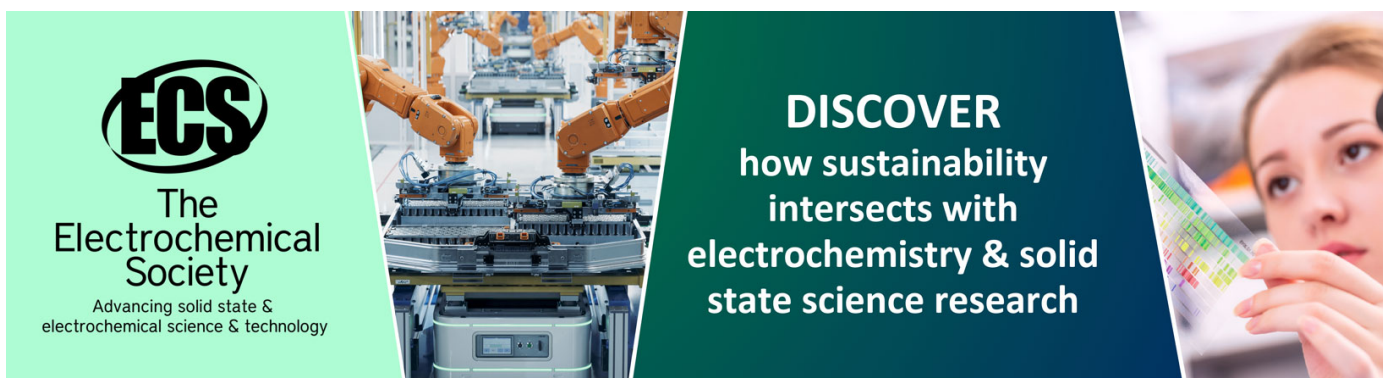
Opportunities and emerging trends for digitalization of Russian economy

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Opportunities and emerging trends for digitalization of Russian economy

O Ergunova, A Skuratov, O Pozdeeva, A. Yu .Kindaev

Department of Department of Tourist Business and Hospitality Ural State Economic University Yekaterinburg, Russian Federation
Penza State Technological University, Russian Federation

o.t.ergunova @urfu.ru, Alexey.Skuratov@urfu.ru, ogp@usue.ru

Abstract. This working paper gives an overview of the new possibilities opened up by the digital economy and tackles some specific questions in relation to its effects on the regional institutional structure in the world and the rate of its development in the Russian Federation. The digital economy fundamentally transforms modern production, thanks to new technological achievements, including robotization, artificial intelligence and the Internet of things, new materials and technology. Due to these changes, the development of the digital economy has been revealed that a number of countries, including Russia, objectively have the preconditions for the transition to the way of digitalization of the economy and development of their potential as the development potential is exhausted through non-innovative tools and increased market competition. In this paper, the authors aimed at providing a better understanding for the theoretical and legal peculiarities of the “digital economy” and its application benefits for Russia. The main problem is how the Russian Federation acts against the economically developed countries, which are the creators of the digital economy. This paper mainly focuses on presenting the authors views on how to sustain and increase competitive advantage of the Russian Federation by catching and implementing the “digital economy”. The degree of development of the digital economy in the Russian Federation is considered and a conclusion is drawn that the domestic digital economy is lagging behind the world leaders.

1. Introduction

Rapid growth and expansion of new information technologies, development of social networks, smartphone markets, broadband Internet access, artificial intelligence technologies and Internet of Things result in changes which transform the way companies, cities, regions and countries function – they have to fall in line with digitalization of economy by means of either expanding their niches or transforming the ones that they already have.

Today there is no common understanding of the Digital Economy phenomenon; other terms such as E-Economy, New Techno-economic Paradigm, API Economy, Application Economy and Creative Economy are widely used. Europeans tend to use the term Digital Economy whereas Americans, namely Deloitte, IBM and some other companies, prefer a more technological API Economy.

When building the platforms of the digital economy, it is necessary to focus efforts on key areas: transport, telecommunications, energy and data processing. The development of these areas will allow creating an infrastructure and technological basis, replicating which to other areas, Russia will be able to rapidly develop the mature digital economy. A focused construction of a number of industrial digital platforms with a unified architecture and standards will allow in the future to build a single digital space that will unite all industries. Such an approach will significantly increase the transparency, manageability and flexibility of the country's economy. This approach seems most appropriate for Russia today, but it still has its shortcomings. To form the concept of a digital economy, which will serve as a basis for corresponding strategy, it is necessary to take into account both the risks of the proposed strategy and the risks of the digital economy itself.



2. Theoretical and methodological basis of study

First terms as well as concept of modern digital economy appeared at the end of the XX century with Don Tapscott in his 1995 book “The Digital Economy” defining Digital Economy as the economy based on digital computing technologies [1]. At the same time American computer scientist Nicholas Negroponte used the metaphor explaining the process of moving from a physical world based on atoms to a digital world based on bits [2]. According to Oxford dictionary, Digital Economy is “an economy which functions primarily by means of digital technology, especially electronic transactions made using the Internet”.

According to IBM’s definition, Digital Economy is an economy capable of providing high-quality ICT infrastructure and mobilizing ICT opportunities for the benefit of consumers, business and the state. BCG specialists give the following definition of the Digital Economy: the use of online and innovative digital technologies by all participants in the economic system, from individuals to large companies and states.

We refer below the definitions of the Digital Economy given by national governments of several countries and international organizations.

Table 1. Definitions of the digital economy approved at the governmental level in several countries of the world

N o	Institution	Definition
1.	Government of Australia	“Global network of economic and social activities that are enabled by information and communications technologies, such as the Internet, mobile and sensor networks”
2.	BCS, Great Britain	“Doing business in markets based on the Internet and / or the World Wide Web” [4]
3.	OECD	“markets based on digital technologies that facilitate the trade of goods and services through e-commerce”
4.	UK Government	“Manufacture of computer and digital equipment, Publishing activities, Media production, Computer programming activities”
5.	World Bank	“System of economic, social and cultural relations based on the use of digital information and communication technologies”
6.	Russian Federation Government	“Activities where digital data are key factors of production while their processing and use in large volumes, including directly at the time of their formation, allow to significantly increase the efficiency, quality and productivity in various types of production, storage, sale, delivery and consumption of goods and services in comparison with traditional forms of economy management”

The basic elements of the digital economy are usually as follows:

- infrastructure, including technical facilities, data storage, processing and transformation centers, information transfer centers, software, telecommunications facilities, etc.;
- electronic services of bodies of legislative and executive state power and administration;
- business processes of business entities through computer networks in the context of virtual interactions between market entities;
- e-commerce, which is currently one of the largest segments of the digital economy [5].

3. The practice of legal regulation of the economy digitalization in the Russian Federation and foreign countries

Consider the practice of legal regulation of the economy digitalization in the Russian Federation and foreign countries. The G20 Ministerial Declaration, adopted in July 2017, supported monitoring activities by the WTO, UNCTAD and OECD, as well as the World Bank and the IMF activities to strengthen trade and investment cooperation. In their view, digital transformation is the driving force behind global, innovative and sustainable growth, contributing to reducing inequality and reaching sustainable development by 2030. Therefore, they committed themselves to providing all their citizens with “digital communication” by 2025, especially while welcoming the development of digital economy infrastructure in low-income countries. Consider the practice of legal regulation of the economy digitalization in the Russian Federation and foreign countries. The G20 Ministerial Declaration, adopted in July 2017, supported monitoring activities by the WTO, UNCTAD and OECD, as well as the World Bank and the IMF activities to strengthen trade and investment cooperation. In their view, digital transformation is the driving force behind global, innovative and sustainable growth, contributing to reducing inequality and reaching sustainable development by 2030. Therefore, they committed themselves to providing all their citizens with “digital communication” by 2025, especially while welcoming the development of digital economy infrastructure in low-income countries [6].

In 2015, the World Economic Forum (WEF) announced the launch of a special long-term program Digital Transformation Initiative (DTI), which, according to its creators, should serve as the “focal point for new opportunities and themes arising from latest developments and trends from the digitalization of business and society”. At the same time, DTI is initially regarded as an important part of the broader activity around the “theme of the Fourth Industrial Revolution”.

The plan “Digital Europe 2020” (eGovernment Action Plan 2016–2020) was approved in the European Union. According to this plan, if the state actively adapts principles of digitalization, the EU countries will be able to save up to \$5 billion annually. Leaders in the level of digitalization of public systems are the countries of Scandinavia, the Netherlands and Austria.

The Presidential Decree No. 203 of May 9, 2017 “On the Strategy for the Information Society Development in the Russian Federation for 2017–2030” states that the development of the digital economy is a strategically important issue for Russia as it determines its competitiveness in the world arena. In accordance with the resolution of the Government of the Russian Federation No. 1632-r of July 28, 2017, the Digital Economy of the Russian Federation Program was approved, aimed at creating “the necessary conditions for the development of the digital economy of the Russian Federation, in which digital data is a key factor in production in all spheres of social and economic activity, enhancing the country's competitiveness, the quality of life of citizens, ensuring economic growth and national sovereignty” [7].

4. Development of the digital economy in the world

According to a study conducted by Boston Consulting Group in 2016, the digital economy is estimated at \$2.9 trillion [8]. The research conducted by BCG on the level of development of the digital economy, taking into account all its sectors, singled out five groups of digital economies for the relative level of development of digital operations and GDP per capita. The group of leaders includes countries with the highest rate of “digitization” of economic operations and high level of technologies used for such “digitization”: South Korea, Denmark, Great Britain, Sweden, Norway and the Netherlands. The second group of countries includes the majority of the developed economies of the world, for example, Germany, the United States, Japan, the EU countries. The third group covers countries with a high level of well-being (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. The fourth group is “beginning leaders”. The level of development of digital operations in these countries is higher than the level of economic development: China and Russia. Experts of BCG refer all the other countries to the group of “lagging behind” in the development of the digital economy.

5. Evaluation of Russia's position in the world's ratings of the economy's digitization

We will evaluate Russia's position in the world's ratings of the economy's digitization (see Table 2).

Table 2. Evaluation of Russia's position in the world's ratings of the digitalization of the economy

Rating	Rank of Russia	Number of countries in the rating
Networked Readiness Index, NRI, World Economic Forum [9]	41	139
E-government development rank, EGDI, UN [10]	35	193
ICT Development Index, IDI, ITU [11]	43	175

Concerning the development of ICT, Russia occupies an average position among other countries. At the same time geopolitical confrontation and international sanctions that have affected Russia have not been sufficient to undermine the effect of technology development, as well as massive use of smartphones and social networks among the population of these countries. Despite the relatively low overall level of digitalization, Russia demonstrates stable growth rates and has the potential to take the lead. According to the McKinsey report “Digital Russia: a New Reality”, Russia ranks 1st in Europe and 6th in the world (87 million people) in the number of Internet users. According to Rosstat statistics, from 2010 to 2016, the number of households with access to the Internet increased from 48.4 % to 74.8 %. Russia ranks 2nd in the world in the lowest prices for Internet and mobile communications. And the number of users of state and municipal services portals doubled only in 2016 and reached 40 million people.

The OSP Data survey “The Present and Future of Digital Transformation in Russia” in 2017 showed that about half of Russian enterprises are already transforming their business, and within two years the share of companies that somehow started the process of digital transformation will exceed 80 %. Among the factors hampering the changes, respondents noted mainly various organizational issues. However, they also noted the shortcomings of the technological platform on the basis of which business changes will be made — for example, a weak readiness for deep analysis of data in order to turn them into information useful for business. Nevertheless, IT managers interviewed consider their companies to be basically ready for digital transformation projects.

6. Results

Russian regions considerably differ in the level of infrastructure development. These differences have historic roots and they are associated with characteristic features of Russia's socioeconomic development over the past decades.

Russia features great differences in transport infrastructure in different regions. In 2016, the greatest density of public railroads was 3.076 km of tracks per 10.000 km² in St. Petersburg. The lowest density of public railways was 2 km of roads per 10.000 km² in the Republic of Sakha (Yakutia) which is 1.538 times less than the greatest density (see Figure 1). By 2016, in comparison with 2006, the differentiation increased by 133 %. This growth was due to the construction of railroads mainly in the European part of the country.

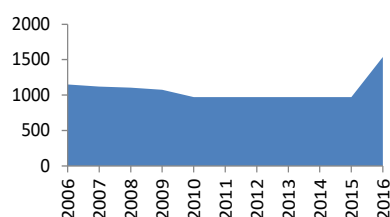


Figure 1. Dynamics of the coefficient of differentiation in the density of public railways in the regions of the Russian Federation [12]. Calculated by authors

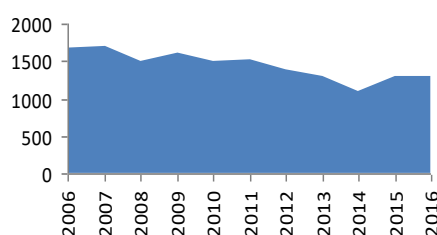


Figure 2. Dynamics of the coefficient of differentiation in the density of highways in the regions of the Russian Federation [12]. Calculated by authors

Regions also have different level of highway availability, with coefficient of differentiation equaling to 1.312 times in 2016. St. Petersburg had the highest density of highways – 2.492 km per 1000 km², and the Nenets Autonomous District had the lowest density of highways — 1.9 km per 1000 km² (see Figure 2). In 2016, the coefficient of differentiation decreased by 22 % compared to 2006. At the same time, in 2016 as compared with 2006, the density of motor roads had more than doubled in 46 regions out of 85. The pace of construction of new highways had increased significantly since 2012. The reason was intensive road construction in the European part of the country.

Excessive differentiation in terms of the level of road infrastructure development in the regions of the country is an obstacle to the existence of a single economic space and can lead to limiting the opportunities for both the development of the country's economy as a whole and the consideration of regional features and regional interests [13].

Huge territories of the Russian Federation, difficult climatic conditions in most of the country predetermine the need to reduce the spatial costs in the development of the economy. It is impossible to solve these problems through the development of basic infrastructure elements in the foreseeable future. Overcoming such a huge differentiation in the development of road infrastructure between regions is a lengthy process and requires significant investment.

Transition to the digital economy, announced by the Government of the Russian Federation, can contribute to reducing spatial costs between production sites and places of consumption, thus creating the basis for economic relations and interaction between business entities through the creation of new infrastructure elements.

Infrastructure facilities that enable the use of information and communication technologies help to solve scientific and technical problems, contribute to information availability, optimize interregional economic ties, which ultimately leads to a steady increase in labor productivity and, therefore, raises the standard of living of the population [14].

Consider the potential of the regions of the country for the transition to a digital economy. Organizations in the regions had different level of availability of technologies that use microelectronics to collect, store, process, search, transmit and present data, texts, images and sound in 2016. In general,

the highest indicator was the total number of organizations using personal computers which amounted to 92.4 % of the total number of organizations surveyed. The lowest indicator was the share of organizations that had a website (45.6 %) (see Figure 3).

However, it is worth mentioning that the level of differentiation between regions in terms of indicators characterizing the development of information and communication technologies is not so vast as in terms of road infrastructure. The share of organizations using personal computers in 81 regions out of 85 was more than 85 %, the share of organizations using servers in 42 regions was more than 50 %, the share of organizations using local area networks in 73 regions was more than 50 %, the share of organizations using global information networks in all 85 regions was more than 60 %, the share of organizations that used the Internet in 84 regions was more than 75 %, the share of organizations that had a website in 43 regions was more than 45 %, the share of organizations using special software in 83 regions was more than 70 %.

All the information and communication technologies considered in all regions for the period from 2006 to 2016 showed the growth rate of 200 or more percent.

Thus, it can be noted that there is a potential for the transition to the digital economy as the growth rate of this area is high. Further development of information and communication infrastructure will make it possible to change the spatial development of the country, to reduce differentiation between regions, to increase labor productivity and production efficiency in all types of economic activity.

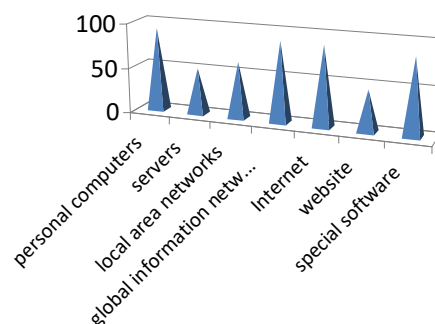


Figure 3. Total number of organizations in the Russian Federation, which used information and telecommunication technologies in 2016 [12]. Calculated by authors

7. Conclusion

In this paper, the authors aimed at providing a better understanding for Digital economy concept and its application benefits for Russia. The main problem is how the Russian Federation acts against the economically developed countries, which are the creators of the Digital economy. This paper mainly focuses on presenting the authors views on how to sustain and increase competitive advantage of the Russian Federation by catching and implementing. With Digital economy, Russian Federation get a bigger share of the world manufacturing value chain. Digital economy “is challenging, since it forces to rethink the way goods are produced, distributed and sold. To fully apprehend the potential Digital economy and anticipate the coming challenges, it is of the utmost importance to consider, and understand, the specific economic nature of digital goods. Countries are divided into four categories:

leaders, countries with a slowing growth rate, promising and problem countries. Some countries are located on the borders of these categories [15,16].

Leading countries have an extremely developed digital economy and a powerful development dynamic. They stimulate the introduction of innovations, effectively using their advantageous position. In order not to lose their positions, these countries must create new demand, and the development of innovative solutions must go at full speed. Otherwise, they risk becoming countries with a slowing growth rate.

Countries with a slowing growth rate have a developed digital economy, but they lose their development dynamics. Top five countries in our ranking (Norway, Sweden, Switzerland, Denmark and Finland) fall into this category, thus showing how difficult it is to maintain growth rates. To overcome the digital plateau, these countries will have to make conscious efforts to rethink their economic model, put everything on those digital technologies and technological areas in which they lead, and remove any obstacles to innovation.

Promising countries currently have a low rate of digitalization, but are developing rapidly. Significant dynamics of development and great potential can make them very attractive for investors. They are hampered by the undeveloped infrastructure and poor quality of the institutional environment. Promising countries have the potential to become leaders of the future. This group is headed by China, Malaysia, Bolivia, Kenya and Russia.

Problem countries are at a low level of digitalization and have low dynamics, which creates great difficulties for them. In some of them, the pace of digital development is declining. The most reliable way to increase the dynamics of development for them will be improved access of the population to the Internet by reducing the gap in the use of mobile Internet, that is, the difference between the number of mobile phones and mobile phones connected to the Internet.

We have to recognize that Russia today has resources for the formation of a mature digital economy, while the distinctive feature of the Russian economy is that the “lion's share” of GDP is created by state corporations (or companies with significant state participation).

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