

# Digitalization of companies - the basis of regions' competitive development

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**Abstract** — The article deals with the development of the digital economy in Russia, the problems of digitalization of companies in the context of the rapid development of information and computer technologies. The stage-by-stage transformation of the country into an information society is being investigated on the basis of introduction of new technologies and platforms using the aggregate index of the development of information and communication technologies. The most important directions of digital transformation of companies, factors influencing this process in the conditions of modern economy are being analyzed.

**Keywords**— *information society, digital company, directions of companies' digitalization, Biesiot indicator*

## I. INTRODUCTION

The current level of development of the Russian economy is characterized by the proliferation of digital technologies in all spheres of management and public life. As the President of the Russian Federation Vladimir Putin noted in his speech at the UN General Assembly, the necessary tool for solving common world problems is the transition to a digital economy that "sets a new paradigm for the development of the state, the economy and the whole society," which allows using information technologies to increase efficiency managerial decisions [1]. By these days, the Government of the Russian Federation (Order No. 1632-r of July 28, 2017) has approved the program "The Digital Economy of the Russian Federation", in which the creation of the ecosystem of the digital economy of the Russian Federation was cited as the goal [2]. It is understood as the use of digital data to ensure effective interaction between business, the scientific and educational community, the state and its citizens.

In this regard, the purpose of the study is to examine the essence of the digital economy and its role in the process of establishing basic technologies, to identify the directions for the digital transformation of business models, business

processes and companies' infrastructure in the way of introducing new technologies and platforms for providing services to consumers in modern economy.

The development of the digital economy calls for the constant progress and improvement of the activities of modern Russian companies. The widespread introduction of five key decisions stimulates digital transformation. These key decisions are:

- Broadband access;
- Data centres;
- Cloud computing centers;
- Large data;
- Internet of things.

The digital era opens up horizons for companies to increase efficiency, mobility and competitiveness based on new technologies. It completes the transfer of all market participants to the united digital world - companies, businesses, consumers, connected objects, which forms new conditions for electronic-network interaction in the market. Digitalization covers an increasing number of companies, industries and regions, translating the actions of employees, processes, products and services into a virtual environment [3].

In 2016, the US Department of Commerce proposed a definition for "digital economy companies". Digital economy companies use technologies such as mobile applications to reduce the number of participants in p2p transactions; rely on the rating system of user ratings for quality control of services; offer service providers the flexibility to determine their

working hours; rely on the use of service providers of their own instruments and assets. The US Department of Commerce identified more than 100 organizations that can meet this definition. The list includes the well-known Airbnb, Uber and others.

## II. MATERIALS AND METHODS (MODEL)

The need for a digital transformation of the company appears when the internal control system is mismatched with higher-level systems and an external "environment" [4]. New digital business models of the company's development will provide additional sources of revenue and competitive advantages, albeit for a short period of time. Therefore, a permanent adjustment of the business model will be required within the framework of the company's developed strategy.

The sustainable development of any organization is possible only if the response speed of the organization's protection system (reference points) is greater than the speed of development of the external threat (digitization rate), that is, the Biesiot indicator, indicator of security (BI) will be more than one:

$$BI = CPE/CPA; \quad (1)$$

where, CPE is the speed of management or response of the company;

and CPA is the speed of outrage or threat.

The stage-by-stage transformation of the country into an information society is characterized by the use of subindexes of the aggregate index of the development of information and communication technologies (ICT): the first stage is the subindex of access to ICT; the second stage is the subindex of using ICT; the third is the subindex of digital skills.

## III. RESULTS AND DISCUSSION

Currently, the speed of "digitalization" of Russian society is about 63% and is constantly growing. Tendencies of Russia's change by subindex are shown in Table 1.

The first stage - Russia's position in the access subindex is constantly improving, but remains very modest.

The second stage of the country's transformation into information society - ICT intensity is measured by the subindex of using ICT. Judging by the data in Table 1, Russia is gradually moving to the intensive use of ICT, characterized by an increase in the penetration of ICT and mobile broadband services. In 2017, the frequency of Internet use by the population as a percentage of the number of respondents aged 16-72 was 73%, the use of mobile devices for Internet access by the population as a percentage of those aged 16-72 was 49%.

TABLE 1. THE SPEED OF DEVELOPMENT OF THE DIGITAL SOCIETY IN RUSSIA

Index name	Unit of measure of the index	Year		
		2015	2016	2017
1. ICT Development Index	Position in the ranking (change from the previous year)	44(+3)▲	43(-1)▼	45 (-2)▼
	Value	6,83	6,95	6,96
1.1 Access to ICT	Rank (change in rank from previous year)	47 (0)●	49 (-2)▼	49 (0)●
	Value	7,26	7,23	7,25
1.2. Use of ICT	Rank (change in rank from previous year)	42 (0)●	45 (-3)▼	44 (-1)▼
	Value	6,23	5,87	5,78
1.3. Practical skills of using ICT	Rank (change in rank from previous year)	14 (0)●	14 (0)●	14 (0)●
	Value	8,54	8,55	8,54

\*Compiled and calculated by the authors on the basis of materials: Measuring the Information Society 2015, p. 28,31,36,45; Measuring the Information Society 2016, p. 30,45-46; International Telecommunication Union: The ICT Development Index 2017

The third stage of the transformation of the country into information society - ICT impact - shows the socio-economic effects achieved as a result of the use of ICT. This stage largely depends on the level of ICT skills achieved in society, which is measured by the subindex of the skills of the aggregate ICT index (see Table 1). This subindex reflects the opportunities of the society to optimize the results of ICT introduction: the level of the existing skills in the society determines the optimality and completeness of attracting the potential of ICT for socio-economic development. By the level of ICT skills, Russia is still at an early stage of development with an estimate of 8.5.

As for the level of digitalization of Russian companies, it also remains low [5] (see Fig 1).

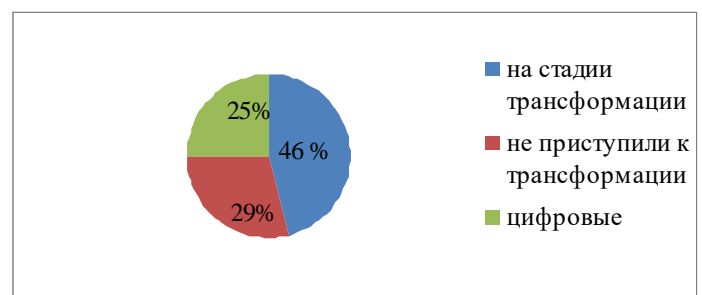


Fig. 1. Level of digitization of Russian companies

Blue – companies at the stage of transformation,  
Red – companies have not started its transformation yet,  
Green – digital companies.

As shown in Figure 1, only 29% of companies are considered digital, 46% are at the stage of transformation and 29% have not yet begun to "digitize". The main criterion for dividing companies is the level of IT-budgeting for digital business transformation. Among the digital companies are PJSC Gazprom, PJSC Sberbank of Russia, PJSC Lukoil - the cost of their digitalization is \$ 160 billion per year.

The directions and objectives, which are digitized in Russian companies, include: the use of the Internet, including broadband, the use of Web sites, cloud services, ERP and CRM systems, the use of the Internet for the purchase / sale of goods, works, services. Dynamics of development of these areas of "digitalization" of companies is presented in Table 2.

TABLE 2. DYNAMICS OF DIGITALIZATION DEVELOPMENT IN COMPANIES

Directions for the development of digitalization	Units of measurement	Year		
		2015	2016	2017
Use of the Internet	% of the total number of companies of the business sector	85	85	86
Use of broadband Internet		79	77	79
Companies having websites		41	42	41
Companies using cloud services		18	18	18
Companies using CRM-systems		13	13	13
Companies using ERP-systems		15	16	17
Companies using the Internet to purchase goods, works, services		17	18	19
Companies using the Internet to sell goods, works, services		12	12	12

Compiled by the authors on the materials: Indicators of the digital economy 2016 and 2017. [Electronic resource] URL: <https://www.hse.ru/primarydata/iio>. - (circulation date 04.01.2018)

According to the data obtained in Table 2, the "digitization" of Russian companies is at a low level. Internet resource for economic activity is used in less than 40% of possible situations.

Accordingly, using the obtained data in Table. 1 and Table 2, we can calculate the Biesiot indicator [6] (ПБ) (see Table 3).

TABLE 3. BIESIOT INDICATOR (BI) IN RUSSIA IN 2015-2017

BI in 2015	BI in 2016	BI in 2017
20/52 = 0,38	21/60 = 0,35	29/63=0,46

Despite the fact that the Biesiot indicator has turned out to be less than one, the speed of response of the company's management system remains less than the speed of "digitalization" of the society. It can be concluded that at present there is a need to increase the level of "digitalization" of Russian companies.

The development of digital companies in the modern economy requires: firstly, improving the management of the organization in the direction of active use of ICT; secondly, creation of a unique innovation base; Thirdly, virtualization of business processes in the form of network interaction with customers (CRM-systems), suppliers, employees, - it is necessary to involve the interested parties in creating value for business, to evaluate and improve the quality of the company's services; Fourthly, enrichment of the basic processes, adapting them to new opportunities and challenges of the changing world on the basis of analysis of the trends in the digital economy, increment of accumulated experience and knowledge; Fifthly, the replacement of low-skilled labour force with "digital personnel" with a high level of IT competence, who are able not only to use ICT in their work, but also to perform analytical work (more than 50% of the time), improvise, work in conditions of uncertainty, making decisions that have a high level of education, a long cycle of preparation and a broad outlook; Finally, constant analysis and building up its positions in rankings, forums and chats, - it is necessary to consider them as a source of competitive advantages, to note the growth in revenues from the use of ICT in the total revenue share and to strive to increase it.

#### IV. CONCLUSION

The analysis of the factors made it possible to identify threats and incentives for the development of "digitalization" of companies in Russia.

The factors restraining the "digitalization" of companies are:

- Complicated access to participation in competitive selection of projects and venture financing in the regions (the necessary infrastructure is not created and equal conditions for applicants are not ensured (according to the RVCA, 83% of the volume of venture investments for 2016 was for companies located in the Central Federal District) );
- Low efficiency of start-ups selection, there is no established multi-level system of project financing;
- Lack of conditions for retaining qualified specialists and business in the country, as well as attracting foreign investors to Russia;

- Underdevelopment of accelerators, business incubators and special economic zones, mechanisms for additional tax incentives to stimulate demand for innovation on their part;

- Lack of regulatory and legal framework for crowd-funding platforms [7].

Factors that stimulate the development of "digitalization" of companies include:

- Increase of the contribution of digitalization to the country's GDP [8]. The country's GDP grew by 7% from 2011 to 2015, and the volume of the digital economy increased by 59% over the same period - by 1.2 trillion rubles in prices of 2015. Thus, in these five years, the digital economy accounted for 24% of the total GDP growth;

- Multiple positive examples of the development of start-ups (Yandex, "Tinkoff Bank", Mail.ru, "VKontakte");

- Successful implementation of the largest digital infrastructure projects "Our city" and "Active citizen";

- Enhancing Russia's access to broadband Internet;

- Presence of an intellectual and scientific base in the country, supported by a good system of secondary and higher technical education;

- Active development of a countrywide ICT infrastructure;

- Awareness of the state importance of these tasks by state authorities and the ability to mobilize resources all through the country to address them.

Thus, we can conclude that the basis for effective "digitization" of companies is: a developed telecommunications infrastructure; growth of investments in specific human capital (i.e. knowledge, skills, including those which can be used only at a certain workplace or only in a particular company), increasing the accumulation of intangible assets and creating clusters around an efficient high-tech enterprise; reliance on their own innovations [9].

## V. PROSPECTS FOR RESEARCH

In the framework of further research, the internal "digital" potential of companies will be evaluated. In particular, it is of interest to carry out an evaluation of the personnel potential of companies, since the improvement of the "digital" skills of personnel is extremely necessary and has important consequences. On the consumer side, it determines the degree of satisfaction of his needs; on the part of the employee - his competitiveness in the search for work. The development of the digital economy in the automation of the processes of creating various benefits, on the one hand, creates a kind of competition between the consumer and the employee for the

performance of production functions, on the other hand, balances their roles in the performance of these functions.

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